Adolescent Drinking:
A Cross-Cultural Comparison of the United States and Ireland

by

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Dedication

I am dedicating this dissertation to my late father, Soulu Chen, who passed away two years before I completed my doctoral research. He was a schoolteacher who devoted his life to children's education in a small village in Southern Taiwan. It is because of his belief in education and his unconditional love for me that I was able to be educated in many prestigious schools in Taiwan, and enabled me to further my education in the United States. He was also the first person in my life that stimulated my interest in culture, society, and social problems. I will always remember him as my father, teacher and friend.

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Abstract

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Many theories have been developed to understand adolescent drinking in the American context. However, little is known about whether and to what extent these theories have cross-cultural validity. This study assessed the cross-cultural utility of some central concepts from four widely used behavior theories: social learning theory, planned behavior theory, alcohol expectancy theory, and problem behavior theory. This study is based on secondary analyses using 2-year panel data from a longitudinal high school student survey conducted in the United States and Ireland during 1991-1993.

As is expected, prevalence rates of drinking, heavy drinking and intoxication were higher among Irish adolescents. Boys also generally drank more and more often than did girls. However, the average usual quantity consumed was greater for American adolescents, particularly boys. These findings suggest a bipolar drinking pattern in the Irish sample. In contrast with earlier studies, the expected greater gender gap for the Irish sample was not found.

The utility of the central concepts from the four behavior theories in predicting changes in drinking was mostly confirmed. Beliefs about drinking, perceived social environment, and drinking behaviors were all relatively stable for adolescents of this age

group. However, adolescent drinking was influenced by many personal and social factors. A reformulated social learning model showed that factors such as independence from parental authority, alcohol expectancies, friends' modeling, perceived availability of alcohol, and general deviance were robust in predicting changes in drinking. Moreover, these effects appeared to be equal for adolescents in the two different countries and for the two genders. However, the results also showed many gender and sample differences in the interactive processes underlying adolescents drinking. There were more similarities between boys and girls in the American sample than in the Irish sample. Age is also an important moderating factor in almost every aspect of the interactive processes. Particularly, the lower legal drinking age in Ireland appeared to have greater impacts on prevalence of drinking and the perceptions of peer drinking and availability of alcohol for older Irish adolescents. Implications of the differences in these interactive processes for alcohol educational programs are discussed.

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Chapter 1: Introduction

Adolescent drinking has been widely studied in the United States and many theories have been developed to understand this behavior within that cultural context. However, little is known about whether and to what extent the theoretical models and socio-psychological variables identified in these theories have cross-cultural validity. The purpose of this study is to assess the cross-cultural utility of some central concepts from four theories: social learning theory, alcohol expectancy theory, planned behavior theory (or theory of reasoned action), and problem behavior theory. This study is based on secondary analyses using data from a longitudinal survey conducted both in the United States and Ireland during the years of 1991-1993 (to be called the US-Irish Project). The overall objective is to increase understanding of factors related to adolescent drinking. A primary aim is to identify the factors that are culturally unique and those that have more cross-cultural generalizability in understanding of adolescent drinking behavior. A second goal is to develop and test a more comprehensive theory of adolescent substance use that incorporates elements from the four behavior theories.

Background and Significance

Alcohol is a legal and popular beverage in most countries. While many countries have set a minimum drinking age in their regulation of alcohol use, most young people have tried alcohol long before they reach the legal drinking age. Underage drinking thus is a universal phenomenon. Because underage drinking is legally prohibited, many Americans consider adolescent drinking to be a deviant behavior. However, experimentation with

alcohol is very common among American adolescents (e.g., Johnston, O'Malley & Bachman, 1998; US Department of Health and Human Services, 1999). For example, the "Monitoring the Future" study (Johnston, et al., 1998) reported that on average by age 18, more than 80% of American adolescents have tried alcohol. Drinking by teenagers in the United States has increased since World War II and has become a major public health concern (e.g., Blane & Hewitt, 1977; National Highway Traffic Safety Administration, 1985). The prevalence of underage drinking has been relatively stable at a high level over the past 20 years, although the U.S. regulation of alcohol use by underage persons is stricter compared to many nations.

Nationwide studies on drinking are not available in Ireland. The fragmentary studies on Irish drinking tend to portray the Irish as heavy drinkers at home and abroad (Bales, 1962; Knupfer & Room, 1967; Walsh, 1987a, b). Overall national alcohol consumption in Ireland, however, is less than wine drinking countries such as France and Italy, but similar to beer or spirit drinking European countries and the United States (Walsh, 1987a, b; Walsh, 1989). Studies consistently find higher rates of abstinence, but also of frequent and problem drinking among Irish drinkers (Morgan & Grube, 1994b; O'Connor, 1978; Walsh, 1989). These studies thus suggest a bipolar drinking pattern among adolescents in Ireland. A study of 5,483 Dublin post-primary school children (aged 12 and up) in 1970, for example, reported a 25% lifetime abstinence rate (O'Rourke, Gough & Wilson-Davis, 1974). Later, a Dublin study in 1984 reported a similar pattern. Among the 3,569 post-primary students (aged 13-17 years), 35% were abstainers (Grube & Morgan, 1986). Nonetheless, in the same study, 48% of post-primary students reported using alcohol in the 30 days prior to the survey and about 39% reported ever feeling drunk in their lives. Among those aged 17 and older (i.e., one year away from legal drinking age), 21% were abstainers, 52% have used alcohol in

the 30 days prior to the survey, and 58% have ever felt drunk in their lives.

Drinking by American teenagers increased after World War II, reached a peak in 1979, and has dropped steadily since then (Blane & Hewitt, 1977; US Department of Health and Human Services, 1999). National data on underage drinking in the United States for the year of 1985 are available to serve as a comparison with the 1984 Dublin data. The 1985 National Household Survey on Drug Abuse (US Department of Health and Human Services, 1999) reported that 45% of American adolescents in the age group of 12-17 were abstainers. About 31% had used alcohol in the 30 days prior to the survey and about 22% had engaged in heavy episodic drinking (i.e., five or more drinks at one drinking occasion) during this period of time. However, for the same year, the "Monitoring the Future" study (Johnston, et al., 1998) also reported that only 8% of American high school seniors had never used alcohol in their lives and about 66% of them used alcohol in the 30 days prior to the survey. Because data collection methods, measures of drinking and age categories used in these studies were different, this comparison is far from conclusive. However, the data suggest that many more of American youth than Irish youth had tried alcohol before they finished high school or post-primary education in 1985.

In 1991 (i.e., seven years later), Grube and Morgan, again surveyed post-primary students in the same schools in Dublin, Ireland. This survey (the US-Irish project) provides an opportunity to directly investigate changes in drinking by adolescents in Dublin area. It also makes possible a direct comparison of youthful drinking between Ireland and the United States. Remarkable changes in alcohol consumption were observed among post-primary students in Dublin, particularly among those aged 17 and over and among girls. The abstinence rate decreased from 35% to 22% for the overall sample and from 21% to 7% for

those students of 17 years or older. The lifetime prevalence of intoxication also went up to 50% for the overall sample and 73% for those 17 years or older. In addition, drinking by girls had increased dramatically and the gender gap found in the 1984 Dublin survey was significantly narrowed (Grube & Morgan, 1986; Morgan & Grube, 1994b).

Drinking by adolescents in the United States has also been changing, but in an opposite direction. National alcohol consumption in the United States increased after the repeal of the prohibition, peaked in the late 1970s, and declined steadily since the 1980s (Brook, Williams, Stinson & Noble, 1989). This rise-and-fall trend was seen in the prevalence rates of drinking both among adult and underage drinkers (e.g., Johnston, et al., 1998; US Department of Health and Human Services, 1999).

The data of the US-Irish Project showed that drinking by Irish adolescents had surpassed that by American adolescents by 1991. Thus, about 82% of the Irish students reported having tried alcohol at least once in their lives, while 77% of the American students reported doing so. However, Irish students started drinking at an older age than American students did, although the age at which Irish youth start to drink had decreased over the previous seven years. Nonetheless, Irish students reported drinking and being intoxicated more frequently than their American counterparts. In addition, Irish students were more likely to report problems that involve alcohol. The gender gap in almost every measure of drinking was much smaller in the American sample than in the Irish sample. Moreover, more Irish girls were occasional drinkers, while more Irish boys were regular drinkers. In contrast, no significant difference was found between boys and girls in either category of drinker status in the American sample (Grube, Chen, Madden & Morgan, 1997; Morgan & Grube, 1994b).

Why do young people drink? Why do young people in different countries use alcohol in different fashions? What factors are related to changes in drinking among young people? Are these factors similar for youth in different nations? The results from three cross-national studies are relevant to address these questions. The first study was conducted by O'Connor (1978) who compared drinking behaviors and beliefs of drinking of Irish young adults with those of English and Anglo-Irish. O'Connor found that the Irish group had the highest rate of abstinence. The three groups also differed in the social meaning of drinking and predictors of drinking. For example, parental modeling of drinking was less influential in the Irish group. The second study compared drinking practices and beliefs between Irish and American adolescents (Christiansen & Teahan, 1987). The rate of abstinence was not significantly different for the two adolescent groups. Irish adolescents, however, reported less frequent social drinking and less problem drinking. Nevertheless, the association between social drinking and problem drinking was stronger for Irish drinkers. Irish adolescents expected fewer positive benefits from alcohol use compared to American adolescents. Another study compared the reasons for drinking given by college students in the two countries (Teahan, 1987). The results showed that Irish college students, female students in particular, were more likely to report that they drink alcohol to release inhibitions. Although male students in both countries reported that they drank for rebellious reasons, this was more common among Irish males. Besides, Irish students were more worried about the negative impacts on their self-image, whereas the American students were more worried about having trouble with authorities because of their drinking.

Although these studies are of considerable interest, they are limited in providing an understanding of the processes underlying drinking and changes in this behavior over time.

Moreover, these studies did not address how drinking is related to other problem behaviors given that adolescent drinking may be part of a syndrome of general deviance (e.g., Jessor & Jessor, 1975). Other factors characterizing the adolescents and their social environment may be important predictors of adolescent drinking and changes in drinking.

Morgan and Grube (1997) compared the two cohorts of Irish youth in 1984 and 1991, suggesting that changes in beliefs about drinking were responsible for the increases of drinking among young people in Ireland. Irish adolescents, compared to those surveyed seven years earlier, expected more positive consequences and fewer negative consequences of drinking. They also perceived more positive social support for drinking. Meanwhile, the "Monitoring the Future" (Johnston, et al., 1998) study reported an increasing perceived harmfulness of drinking among American adolescents, whereas perceived social support of drinking has been decreasing during those years when the US-Irish surveys were conducted.

The association between drinking, attitudes toward drinking, and the perceived social environment, to some extent, has been confirmed by both the cross-sectional and trend studies. Taking advantage of the longitudinal design and the data on general deviance in the US-Irish project, the present study, using panel data, attempts to provide a better understanding of the processes underlying drinking and changes in drinking behavior in adolescents. Whether these processes are similar for the youth in different countries is also examined.

Research Questions

Because the availability of the data and personal interest in a research methodology of symbolic interactionism, three theories, which are essentially social learning theories of social behavior but with different emphases, were used to study adolescent drinking. In

addition, given the deviant aspect of adolescent drinking, this behavior is also studied using a problem behavior theory.

First, social learning theory (e.g., Akers, 1985; Bandura, 1977, 1986) posits that social behaviors are primarily learned through differential association with others. Differential association, vicarious learning, anticipation of consequences, and social reinforcement are considered the major mechanisms that determine the performance of behavior. This theory attempts to illustrate an ongoing interactive process between the person (represented by his or her attitudes), social environment (e.g., normative beliefs and modeling) and the behavior, whereby an individual learns and subsequently performs a behavior. Second, alcohol expectancy theory (e.g., Goldman, Brown & Christiansen, 1987; Leigh, 1989) focuses on the cognitive process that may serve as motivation for actions. It stresses that the anticipation of the consequences of drinking affects subsequent drinking in a way that anticipated positive consequences encourage drinking, whereas anticipated negative consequences discourage drinking. Drinking takes place when positive expectations outweigh negative expectations. Third, the theory of reasoned action or planned behavior (e.g., Ajzen & Fishbein, 1980; Ajzen, 1989) elaborates the underlying rationale of decision making. This theory is based on the assumption that people are rational. That is, an individual's attitudes toward a behavior and perceived support by others for performing that behavior affect his/her intention to engage in that behavior, which subsequently determines actual performance of behavior. Moreover, when an individual believes that performing a behavior is within his or her own control, he or she is more likely to perform that behavior. These three theories can be applied to conforming as well as deviant behaviors. The fourth theory, problem behavior theory, however, posits that drinking is part of adolescent

psychological development that signals the movement toward deviance, independence, and unconventionality (e.g., Donovan & Jessor, 1978; Jessor & Jessor, 1975, 1977).

In summary, the present study attempts to illustrate the interactive social processes underlying adolescent drinking using the concepts of cognitive incentive (i.e., expectancy), adolescent psychosocial development, and social learning (or social influence). Moreover, this study also investigates whether these interactive processes differ in different social contexts. If they are different, what are the factors and which part of the interactive processes that make the difference? Finally this research attempts to integrate these four approaches into a single and more comprehensive theoretical framework.

Organization of the Thesis

The remainder of this thesis is specifically concerned with describing the theoretical framework, methods, and findings. Chapter 2 describes briefly a number of cultural and environmental differences between Ireland and the United States that are relevant to understanding the drinking practices of youth in these two countries. Chapter 3 presents the four theoretical frameworks that guided this research and provides a review of relevant literature for each theory. Chapter 4 describes the data collection procedures and the sample used in this study. It also describes the methods used to obtain the panel data from a three-year longitudinal study that used anonymous, self-administered questionnaire surveys. This chapter also describes the statistic technique used to adjust for the sample bias due to attrition. In addition, the procedures used in the data analyses are described. Chapter 5 compares the socio-demographics for the two samples and the drinking practices of boys and girls within each sample. Chapter 6 presents the results of the primary data analyses. Separate analyses using structural equation modeling were used to assess the utility of central

concepts from each of the four behavior theories. Subsequently, a reformulated social learning model was constructed and tested based on the findings from the four behavioral models. Cross-group comparisons were also performed for each of the theoretical models. Finally, Chapter 7 summarizes the findings and concludes this research.

Chapter 2: Culture and Social Environment

There are a number of cultural and environmental differences between Ireland and the United States that are relevant to understanding the drinking practices of youth.

Socio-Demographics

The United States is a culturally diverse nation of immigrants. Each wave of immigrants brought its own culture. Therefore, various beliefs and practices regarding alcohol use exist side by side in the United States. Ethnicity is often cited in the literature as being strongly associated with particular drinking practices. Religion, which may be closely associated with ethnicity, is also often linked to particular drinking practices. For example, the Jewish is known for their moderate drinking practices and Muslims practice abstinence. This diversity is reflected in the American sample used in this study.

The three U.S. counties included in the US-Irish Project had a population of about 2.5 million (California Department of Commerce, 1986). The population was heterogeneous, comprising 68% Caucasian, 13% black, 11% Hispanic, and 7% Asian. They were predominantly working and middle classes, working for manufacturing, wholesale trade, government and services. No particular religion is considered dominant in this area. In contrast, the students in Dublin were drawn from an area with a population of about 1 million (Central Statistics Office, 1986). They were predominantly Celtic (white), Catholic, and working or middle class working for manufacturing, wholesale trade, government and services. In short, the socio-cultural environment in which American students resided was very heterogeneous, whereas the Irish social context was relatively homogeneous.

Social Bonding

Historically, the Irish are more collectively oriented than are Americans and bonding to family, religion and other traditional institutions is stronger (Davis, Grube & Morgan, 1984). The homogeneity in the population and religion partially contribute to the strong social bonding. In Ireland, about 94% of the population are Roman Catholic (Central Statistics Office, 1991). Stronger bonding to religion was associated with lower rate of substance use by the students in the 1984 Dublin study (Grube & Morgan, 1986). Similarly, stronger bonding to family was found to be associated with lower alcohol consumption. However, Ireland has experienced considerable social and cultural changes in the past three decades that have had negative impacts on people's well-being. One indicator of this negative impact has been a dramatic increase in the suicide rate among males, particularly those 20-24 years old (Kelleher, 1998). Moreover, the greatest increase in suicide has been found in rural areas where people were traditionally most loyal to the Catholic Church. Another indicator was a notable growing trend in illicit drug use in Dublin, particularly among young men (Dean, O'Hare, O'Connor, Kelly & Kelly, 1985; O'Gorman, 1998). These findings suggest that the traditional social control mechanisms longer function as they did. The number of people attending religious services and practicing religious rituals has been decreasing (McGréil, 1991, cited in Kelleher, 1998). In addition, the institution of the family in Ireland has also undergone considerable transformation, thus weakening an individual's bonding to the family (Kelleher, 1998).

Secondary Education System

School is a significant social institution for most adolescents. However, how drinking practices vary as a result of the school that adolescents attend is far from clear. Nonetheless,

students in different schools may lead distinctive lifestyles. The school the adolescent attends may subsequently influence his or her lifestyle, including drinking. The Irish post-primary school system differs from the American high school system in many ways. The following briefly describes the secondary education system in the two countries.

United States

Secondary education in the United States begins around grade 7 (age 13) or 9 (depending on district) and ends at grade 12 (age 18). Some states or school districts divide secondary education into junior high school (usually grades 7-9) and senior high school (usually grades 10-12); some have a 6-year high school system; and some others have a system of 4-year primary school/4-year middle school/4-year high school.

Being educated in a public school is established as a legal right in the United States. The state and territorial governments provide free public school education through secondary school to all children. School attendance is compulsory, but need not be public. Students can enroll in public or private schools, or even be home-tutored. About 12% of American students are either enrolled in private schools or are home tutoring (U.S. Department of Education, 1999).

The American public high schools are primarily comprehensive in nature and their curricula are mixed with academic, general, and vocational emphases. School age children are usually assigned to a particular high school based on their residence. However, parents have alternatives. They can enroll their children in the schools they favor by moving to other districts or they can enroll their children in private schools that meet their expectations.

Private schools charge tuition, set their own admission criteria and can be classified into two general categories: (1) parochial schools administered by religious agencies and (2)

other private schools administered by non-profit or for-profit agencies. Private schools generally focus on academic curriculum. Although school assignments based on residence can prevent segregation along socioeconomic lines, private schools, however, tend to recruit students from middle and upper class families. Nevertheless, because parents can relocate their residence and people with similar socio-economic status tend to reside together, public high schools with distinguished reputation in well-off communities are not uncommon (Coleman & Hoffer, 1987).

Ireland

The post-primary (or secondary) education system in Ireland consists two cycles, i.e., a three-year junior cycle (for students of age 12-15) followed by a two- or three-year senior cycle (for students of age 15-18). A Junior Certificate examination is taken at the end of the three-year junior cycle. Compulsory education ends at the junior cycle (i.e., age 15). There is an optional one-year Transition Year Programme in the senior cycle followed by a choice of three 2-year Leaving Certificate Programmes. The Transition Year Programme, an examination-free period, has been introduced to provide students a chance for personal development before going for further higher education. A Leaving Certificate examination takes place at the end of the senior cycle (Department of Education & Science, 1999).

There are three different types of post-primary schools in Ireland (Department of Education & Science, 1999). First, secondary schools, educating about 61% of post-primary students, are state-subsidized (about 95%) private institutions run by religious orders or an independent board of governors and focus on an academic curriculum. Second, vocational schools, educating about 26% of the post-primary students, are similar to secondary schools in structure, administered by vocational education committees, but emphasize non-academic

subjects. Third, comprehensive/ community schools, run by local boards, combine academic and technical education and educate about 13% of the post-primary students.

To some extent these three types of schools are segregated along socioeconomic lines. Students at secondary schools are largely from middle- and upper- middle-class families, while those at comprehensive/community and vocational schools are predominantly from middle and working class. Also, secondary and vocational schools can each be classified as boys', girls' and mixed-gender schools (Breen, 1986).

Drinking Culture

Both the United States and Ireland were "wet" countries before the 20th century. They both had a history of battling with excessive drinking and drunkenness in their citizens. Today, both the American and Irish cultures are "ambivalent" toward the use of alcohol in the sense that there are conflicts between co-existing positive and negative attitudes toward drinking (Lender & Martin, 1982; Morgan & Grube, 1994a; Pittman, 1967). It is suggested that alcohol problems are more prevalent in an ambivalent culture than in those cultures in which stable norms and sanctions toward drinking have been established (Knupfer & Room, 1967; Ullman, 1958). Nevertheless, the two cultures are ambivalent in their own ways.

United States

The drinking culture in the United States is related to its history of immigration. The colonial American drank often and heavily. According to Rorabaugh (1979), two patterns of drinking were observed in this era. One was daily, regular drinking in small quantities, often alone or at home with family. The other one was communal bingeing, a form of public drinking during special occasions, to the level of intoxication. These two styles were clearly differentiated by the colonialists. Although heavy drinking was prevalent, public

drunkenness was uncommon but, if it occurred, it was generally considered acceptable and non-problematic (Lender & Martin, 1982; Levine, 1978; Rorabaugh, 1979).

Until the end of the colonial period, the perception of alcohol as a positive good remained strong. However, according to Rorabaugh (1979), drinking habits started to change after the colonial period. The period of 1790s-1830s probably was the heaviest drinking era in American history. The increasing consumption of distilled liquors was largely responsible for this change in drinking practices. All-male, outside-of-home, binge drinking became more prevalent than in the colonial period. Drunkenness was widespread. Public drunkenness was often used to express anger and hostility. Drunkenness was also often associated with illicit behaviors. The changing drinking patterns came to have an increasing public impact. Some civic leaders came to believe that excessive drinking would destroy the drinker, undermine social order and stability, and eventually destroy the country. The rapid growth of taverns and drinking at taverns, however, were far beyond their control. Still, some areas enacted laws banning the use of hard liquors, although implementation was not effective (Bacon, 1967; Lender & Martin, 1982; Levine, 1983; Rorabaugh, 1979).

According to Bacon (1967) and Lender and Martin (1982), alcohol use in the United States changed with the larger social and cultural changes during the American Revolution and in the early 1800s. America was developing in a pluralist direction because of emerging individualism and other concurrent social processes such as mass immigration from Europe and industrialization. As a consequence, old social norms were no longer able to control excessive drinking or public drunkenness.

A small group of the upper class (primarily ministers, physicians, businessmen and farmers), concerned that problem drinking may lead to serious social disruptions, attempted

to change American attitudes toward alcohol during these years with the emergence of the temperance movement, founded during the 1820s. Early temperance reformers located the source of all social evils in the use of liquor and advocated for abstinence. From their perspective, society would be free of problems if people did not drink spirits (later, all alcohol). Also, in their view, the regulative measures in the colonial period failed to control drinking because they were not designed to reform social customs. A moral reform that called for self-control and social responsibility was needed to bring the American society into more perfect social order. This ideology was further strengthened after the Civil War, when industrialization and urbanization dramatically affected American life in every sphere. Americans, especially the middle class, were seeking a better social order in order to enjoy the prosperity of this new era. The temperance movement emerged among a series of social reforms, later becoming the predominant and most enduring mass movement throughout the 19th century (Krout, 1925; Lender & Martin, 1982; Levine, 1983).

Regulation of adolescent drinking changed corresponding with changes in the general social atmosphere toward drinking. In colonial America, adolescent drinking was not an issue of concern. Only drinking at taverns without parents' or guardians' permission, drinking at unreasonable hours, and excessive drinking were regulated. In general, parents had ultimate authority over their children's drinking at or away from home. Adolescent drinking was generally handled in this manner in America until national prohibition (Mosher, 1980).

The temperance movement portrayed children as victims of drunken parents and broken homes. Legislation, based on this conception, made drinking not a crime for adolescent drinkers, but for the adult servers. As the pressure from the temperance

movement became stronger, regulation of adolescent drinking increased. Eventually, most states banned any alcohol sales or gifts to minors. Legal drinking age was also raised from 14 to 16, 18 or in some states, 21. However, regulation of adolescent drinking before national prohibition was primarily to prevent adults from supplying alcohol to minors and was particularly targeted at taverns and saloons. There was never a ban on all youthful drinking and off-premises drinking was generally not regulated.

Heavy drinking was reported to be accompanied by delinquent behaviors among college students throughout the 19th century (Mosher, 1980). Liquors were usually provided at class functions. As an impact of the temperance movement, some state and school authorities tried to restrict the availability of alcohol near the university campus and to ban use of alcohol in the college buildings. However, drinking among college students was still prevalent.

The temperance movement eventually led to national prohibition. However, it did not put an end to drinking. Those who drank still drank. They just drank less beer and more wine and distilled liquors (Lender & Martin, 1982). Alcohol kept at home for personal use was legal. Many Americans were well prepared (e.g., storing ample supply in their cellars) for the coming dry years. Private distilling, although illegal, was very common. Moreover, an underground liquor industry developed.

Some have suggested that acceptance of drinking among the middle class increased during national prohibition (Levine, 1983). Levine (1983) suggested that the broader social and economic changes in the 1920s contributed to this changing attitude. During this period, many social problems that had emerged from the process of urbanization-industrialization had been ameliorated and, consequently the fear of social disorder as a consequence of

drinking gradually receded. In addition, although illegal, drinking patterns during prohibition were not perceived to be dangerous or socially disruptive. People thus became more tolerant toward drinking. The 1920s were also characterized as a period in which Americans had more free time and greater economic security. A new "middle-class lifestyle" that emphasized consumption developed. Moreover, people started to judge success and status by consumption. Drinking became a symbol of lifestyle associated with affluence. It was in this social milieu that casual, recreational drinking emerged and flourished, especially in the cities, while the nation was under prohibition (Kerr, 1985; Lender & Martin, 1982; Levine, 1983).

Young people's role in the family and society changed as a consequence of broader social and economic changes. Their activities also drew more public attention. Informal observations suggest that drinking among middle and upper class youth increased and became more prevalent (Levine, 1983; Lusk, 1932). Officials believed that there was more drinking by the youth (particularly high school students from wealthy families) than during pre-prohibition years. Young people thought that having a drink was "a smart thing to do". They often drank for the novelty and adventure of the experience. It was suggested that drinking by college students was similar to drinking patterns of adults during this period (Lender & Martin, 1982). They drank to express "a newer, freer lifestyle". Nevertheless, a majority of college students did not engage in drinking.

Prohibition failed. Organized repeal activities rose among some wealthy men of major corporations, banks, and industries. These men were increasingly concerned with a widespread disrespect for all existing law as a result of a general lack of respect for prohibition. Especially after 1929 when the Great Depression badly hit the American

economy, these men felt threatened by the widespread lawlessness among the poor and the unemployed. Most importantly, they felt that revival of the liquor industry would create jobs and provide revenue for state and local governments. They also believed that if liquor taxes were restored, their personal and business income taxes would be significantly reduced. In order to bring about "a new era of productivity and prosperity", the prohibition amendment was repealed in 1933 (Lender & Martin, 1982; Levine, 1983).

As promised by Repeal, the liquor industry brought revenues to the government and jobs, economic security and tax reductions to Americans. However, the period after Repeal, even today's time, might be characterized as "a period of confusion and anxiety" (Page, 1988) and "an age of ambivalence" (Lender & Martin, 1982) with regard to alcohol use. Although government at all levels felt compelled to place controls on alcohol distribution because they did not want to see another temperance movement occur, they were divided, however, with regard to alcohol policy. As a result, alcohol policies vary among states.

There is no doubt that the influence of the temperance movement lingers. Although drinking has again become widely accepted as normal social conduct by the majority of Americans, the negative image of drinking remains. People generally continue to feel uncomfortable with excessive drinking and its negative consequences. Concerns with problem drinking remain strong. The modern alcoholism movement, emerging during the 1940s and 1950s, and the anti-drunk driving movement, emerging in the 1980s, have been major forces that have significantly affected the nation's alcohol policy. Since then, the United States have entered an era of "problem amplification" that alcohol-related problems have been catching greater public attention (Room, 1991).

Regulation of adolescent drinking since Repeal have been significantly shaped by the

changes in society's views of alcohol. After Repeal, alcohol became a legal and popular drink for adults. However, it was commonly believed that alcohol use by youth should be prohibited or limited. Although states differed in their statutory penalties, they commonly showed a gradual move toward stricter control. And finally as a consequence of the anti-drunk driving movement during the 1970s-80s, a national alcohol policy regarding youthful drinking-- a minimum-drinking-age (21 years) law--was passed in response to public concerns and for intervention purposes. The rationale underlying this law was that (1) young people are inexperienced in drinking and not mature enough to handle alcohol, (2) drinking by the young may encourage delinquency and later alcoholism, (3) younger youth may be encouraged by older youth to drink, and above all, (4) it was to eliminate the cross-boarder problem that some underage youth went to neighboring states where they could legally drink because a younger legal drinking age was enforced there (Mosher, 1974, 1977, 1980; Pittman, 1991).

Since the rise of the temperance movement in the 1840s, alcohol use by youth has constituted a case of delinquency in that either the drink provider or the drinker or both would be subjected to legal penalties. But, to some extent, parental discretion was highly honored. In this vein, adolescent drinking was widely tolerated, even ignored, by the society until recently. However, when the anti-drunk driving movement successfully utilized empirical evidence to lobby for stricter laws, adolescent drinking came to be perceived by the general public more as a deviant behavior that not only harms the drinker but also puts others' lives in danger. Adolescents as a group were identified to be in need of a special treatment because studies reported that this population was disproportionately involved in drinking and driving injuries and deaths (e.g., National Highway Traffic Safety

Administration, 1985). Consequently, drinking by adolescents became a public health issue. More and stricter laws have been written in order to regulate sale, purchase, possession, and consumption of alcohol that involve underage persons. Moreover, the adolescent drinker can be arrested and sent to the juvenile court for his or her drinking in many jurisdictions.

Ireland

Drinking in Ireland before the 19th century was similar to drinking practices before national prohibition in the United States. Traditional Irish drinking was convivial and utilitarian in nature (Bales, 1962). Alcoholic beverages were served at almost all occasions, including weddings, wakes, funerals, economic trading and male social gatherings. It was basically used as a social lubricant to help communication flow smoothly. Drinking or intoxication was also used as a vehicle for emotional expression, such as hostility, toward others. As regards to utilitarian usage, alcohol was often used as a medicine to cure diseases, get rid of hangover, and release tensions and as food to keep warm and quiet hunger.

Ireland also had a temperance movement during the 19th century. According to O'Connor (1978), it can be divided into two stages: the campaign led by Father Mathew before 1850 and another one led by Father Cullen in the late 19th century. Father Mathew's temperance movement primarily centered on lower classes drinking. The appeal was to excessive drinkers to give up their alcohol. This campaign was not well organized or managed, but heavily relied on Father Mathew's charismatic leadership. After Father Mathew died in 1856, the campaign fell apart. Another critical factor that contributed to campaign failure was the lack of support from the Catholic Church. In fact, because this campaign limited involvement of priests and allowed people of all religions to join, it actually encountered some hostility from the Catholic Church.

However, in Dublin, Dr. Spratt was able to keep the temperance movement going. He revitalized the *Dublin Total Abstinence Society* in 1836. The Society introduced coffeehouses in Dublin. Moreover, the Society was attached to the local churches in the Dublin area. Meanwhile, other important activities took place that established a solid foundation for the later temperance movement. These were the closing of public houses on Sunday and holy days and the Confirmation Pledge, introduced by Dr. Furlong. The Confirmation Pledge particularly appealed to the youth. It was a pledge to abstain from alcohol until the age of 21 years and it was taken at the Catholic confirmation ceremony, usually taking place at age 12 or 13 years.

Father Cullen led the second large-scale temperance movement in later 1889. Knowing how Father Mathew's campaign failed, the *Pioneer Total Abstinence Association* was well planned and structured by Father Cullen. Moreover, the goal of the movement had been changed to focus on moderate drinkers or people who never drank. It started with a pledge for "not getting drunk" and later moved to total abstinence. The activities primarily aimed to ensure that the abstainers remain abstinent and, further, provide role models for others. Unlike the temperance movement in the United States that was backed with physician's warnings, Father Cullen's temperance movement was primarily a moral suasion that appealed to people to give up alcohol as a sacrifice to the Sacred Heart.

Father Cullen's temperance movement grew and developed into a national organization via a gradual, well-planned, and peaceful approach. Unlike the temperance movement in the United States, it never lobbied the government to pass legislation banning alcohol. Instead, it built upon the support from the Catholic Church and used religion as the channel to distribute temperance messages.

Father Cullen also concentrated on youth and wrote the *Temperance Catechism,* that was later used as a textbook in religious classes. The *Juvenile Total Abstinence League of the Sacred Heart* was established as a result of his concern that the social environment constantly provided bad examples for children. Meanwhile, he tried to change the environment by building the *Pioneer Hall* in Dublin in 1907. Entertaining activities were provided for the poorer classes at the Hall, hoping to replace the entertainment at public houses, dance saloons, and so on. Night shelters, sailor's homes, and hostels were also built for people who needed a temporary place to stay. Today, the *Pioneer Total Abstinence Association* still exists, but its influence has substantially decreased. The Confirmation Pledge has also been generally discontinued.

Alcohol consumption in Ireland, according to Walsh (1987a), "....was heavy towards the second half of the 18th century, declined in the first half of the 19th century, increasing again to the onset of World War I.....Between 1920 and 1950 alcohol consumption--and alcohol problems--were at a low level in Ireland" (p.747). National alcohol consumption in Ireland rose rapidly during the 1960s because of economic prosperity and declined during 1973-74 due to economic recession. During the 1960s, the number of abstainers decreased, especially among women and younger people. Alcohol consumption increased briefly in the late 1970s and declined again in the 1980s because of a severe and prolonged economic recession (Walsh, 1989).

The emphasis of the temperance movement also changed in the late 1960s (O'Connor, 1978). The new goal is to promote responsible drinking. A *Renewal and Youth* organization was formed in 1972, aiming specifically at helping young people to develop responsible attitudes toward drinking. Undoubtedly, the temperance movement significantly affected the

attitudes toward drinking in Ireland. However, traditional drinking practices did not completely subside. In O'Connor's (1978) opinion, focusing on non-drinkers, the *Pioneer Total Abstinence Association* "failed to understand the system that produced excessive drinking".

The legal drinking age in Ireland is 18 years. Evidence suggests that Irish youth may have a greater accessibility of alcohol than American youth do because proof of age was rarely required for purchase of alcohol (Davies & Walsh, 1983). However, controls on the sale of alcohol (e.g., legal hours of sales, mandatory mid-day closures, etc.) were much stricter in Ireland than in the United States. However, this has changed recently and hours of sale have been liberalized. Alcohol was typically more expensive in Ireland than in the United States. However, alcohol in Ireland was considered relatively cheap in that young people's pocket money was enough to get them drink (Morgan & Grube, 1994b).

Chapter 3: Theoretical Literature Review

From a conventional perspective, adolescent drinking is considered as a deviant behavior that violates social rules or norms. This approach has its basis on the functionalist concern with social order. Socialization and social control are the main mechanisms through which a social system maintains itself (Parsons, 1965). Researchers and policy makers in the United States have adopted this functionalist perspective of social deviance. Deviance, in this perspective, implies a failure in the social system. As regards underage drinking, on the one hand, new or stricter laws are enforced to regulate underage drinking (Mosher, 1980). On the other hand, factors (or risk factors) that cause the deviance are identified in the socialization process in which the drinker's personality and his or her social/cultural environment are involved. Empirical studies using this approach have provided us with abundant information about the individual drinker and the environment to he or she is exposed. The implication of such information is that persons with certain criteria are considered as a high-risk group to become deviant in terms of their alcohol use. However, focusing on the etiology and psychosocial antecedents, this approach has been criticized by interactionist researchers for its deterministic assumption and inability to distinguish moral degeneration from diversity (e.g., Blumer, 1969; Matza, 1969).

"Youth culture" is widely studied by researchers using a structural interactionist approach. Youth fashions, music, speech, and other activities are interpreted as a distinctive "subculture" system from mainstream culture. Results from youth culture studies significantly affect the popular impression of youth. Unfortunately, the perception of adolescents from youth culture studies is usually negative (Petersen, 1988). From this

perspective, adolescence is usually characterized as "storm and stress" (Hall, 1904, cited in Petersen, 1988), irresponsibility, pleasure seeking, athletics, sexual attraction, and repudiation of adult control (Davis, 1944).

Does adolescent drinking pattern reflect these negative characteristics portrayed in the youth culture studies? Regardless of illegality, is adolescent drinking deviant because of the particular drinking style? Studies in many societies have suggested that adolescent drinking patterns mirror adult drinking practice. Wada, Price and Fukui (1998) found that, Japanese young people, as they age, started to use alcohol in a way that reflects the adult drinking culture. For example, a higher prevalence rate of drinking at ritual parties among friends was found among older adolescents. Moreover, drinking beer after taking a bath, which is a common practice among adult males in Japan, was also found very prevalent among boys. Drinking in Greece presents another example. According to Marcos and Johnson (1988), drinking and smoking are acceptable and appropriate behaviors at social gatherings in Greece. In fact, people are expected to share and participate in social drinking and smoking. One would be accused of ruining a good time for everybody if he or she refuses to participate in such activities. Although drinking or smoking in the public places by persons under 18 years old is illegal in Greece, social drinking and smoking are very common among adolescents. Also in Ireland, adolescents were found to drink a large amount of alcohol at any given drinking occasion, resembling the adult drinking practice (Morgan & Grube, 1997). As regards knowledge of alcohol use and its consequences, studies have shown that adults and adolescents share a similar belief structure regarding the effects of alcohol (e.g., Brown, Christiansen & Goldman, 1987). In contrast, adult and adolescent drinking patterns in the United States appear to be divergent. Whereas social or light drinking appears to be

the norm among American adults (Hilton, 1991), the norm among American adolescents appears to be one of heavy episodic drinking. Thus, for example, about one-third of high school seniors report getting intoxicated within the previous month and a similar percentage report having five or more drinks in a row in the past two weeks (Johnston, et al., 1998).

Drinking is a socially learned behavior. Moreover, adolescents are rarely solitary drinkers. Just like adult society, most drinking by adolescents takes place at social occasions, celebrations, and usually in large groups with persons of their own age (e.g., Beck & Treman, 1996; Mayer, Forster, Murray & Wagenaar, 1998). The present study proposes to study underage drinking as one of "social action". The emphasis is that drinking by adolescents is not just a behavior, but a social behavior. It is an action that involves others in social settings. It is also a "conforming" behavior in terms of its practice. Its pattern indicates that adolescents have well internalized norms and values about drinking derived from the surrounding adult society or from other sources (e.g., peers and media). However, it is also a deviant behavior from a legal perspective. The present study will investigate the social processes through which adolescents learn to drink and further modify their drinking beliefs and behaviors. Adolescent drinking is studied using an interactionist approach in which the adolescent is an active actor in his or her own social arena and drinking is one of his or her behaviors.

Society, from Weber's (*Economy and Society*, 1978) point of view, is an arena for individuals or social groups to act. An action is social when it is subjectively and meaningfully oriented to the behavior of others. Similarly, Blumer (1969) posited that a social action must be viewed as a "joint action", into which separate lines of action fit and merge. "Meanings" arise from the process in which the individual identifies, defines, and

interprets things or situations. Therefore, engaging in a social action depends on the meaning identified, defined and interpreted by the actor in the situations.

Another distinctive aspect of the interactionist approach is that it examines the process through which a behavior becomes deviant from the actor's point of view (e.g., Becker, 1963; Blumer, 1969; Matza, 1969). In this perspective, individuals are active players. How the actor perceives, interprets, and judges his or her situation determines subsequent action. Deviance arises in the interaction between the person who commits the act and others who react to it. Social groups make rules. Deviance is a consequence of the application of rules and sanctions by others to an offender of the rules. Therefore, whether the behavior is regarded as deviant is contingent on actors, others, and the context. The antecedents or predisposing factors emphasized in the conventional approach do not determine social actions, but rather are part of the situation that individuals take into account when they act (Blumer, 1969). The advantage of taking an interactionist approach is that instead of aiming to correct social pathology, this approach tries to best reveal the nature of social phenomenon. Without being constrained to the conception of pathology, a better understanding of a deviant behavior may be granted. However, this does not preclude considering underage drinking to be deviant. From a legal perspective, drinking by adolescents is illegal, no matter how they drink.

Alcohol use, unlike youth fashion or language, is not a particular subculture among youth that distinguishes itself from the mainstream culture. However, underage drinking is distinctive because the majority of young people try alcohol, although it is illegal for them to drink. Moreover, studies have shown that age at first drinking has been decreasing. In other words, more adolescents start experimenting with alcohol at a younger age. It is not clear

whether it is because adolescents are more deviance-prone or they receive more social influence that favors alcohol use. Based on these considerations, the following theories were used to address the issue of adolescent drinking.

Social Learning Theory. Social learning perspectives on social behavior (e.g., Akers, 1985; Akers & Lee, 1996; Bandura, 1977, 1986) posit that an individual learns behaviors primarily through observation and association with others (e.g., theory of differential association). Therefore, a person who associates with drinkers is more likely to learn to drink than those who do not associate with drinkers. Moreover, behavior is not necessarily learned through direct experience. Rather, an individual also learns about a behavior and its consequences by observing others who perform that behavior. Such information is stored in the individual's memory as norms, outcome expectancies and efficacy beliefs. Norms are beliefs about the extent to which a particular behavior is approved of and socially acceptable in a given context. Outcome expectancies are beliefs about the likelihood that a behavior will have specific positive and negative consequences. Efficacy beliefs refer to the individual's assessment of his or her ability to perform a behavior.

Social learning theories also distinguish between learning and performance. It is the interaction of the person with his or her social environment that determines the performance of behavior. Although a behavior may be learned, it may not be performed because of situational factors (for example, low availability of alcohol) or other contextual constraints. The interactive process does not end at the performance of behavior. On the contrary, it is an ongoing process through which personal experiences, in turn, modify beliefs or attitudes and affect decisions about who to associate with.

Social learning theory has been widely used in studies of socialization and behavior

in the developmental process during adolescence. Family, school and peers are considered the primary socialization sources for adolescents. The relative importance of parental and peer influences in adolescent development has been widely studied. Studies find that parents and peers differentially affect adolescent substance use, depending on area of influence and stage in adolescence. Biddle, Bank and Marlin (1980) found that peer influence, generally, is greater than parental influence on adolescent drinking. However, adolescent drinking was rarely a consequence of direct pressure from others. Instead, parental and peer influences are mediated through adolescents' own outcome expectations, particularly for older adolescents. In addition, peers influence adolescent drinking more through behavior modeling, whereas parents' norms were a better predictor of adolescent drinking than parents' own drinking. As regards the nature of peer influence, research also finds that closeness of friendship is differentially associated with adolescent substance use, such that "good friends" are more influential in initiation to drug use, while "best friend" is most influential in maintenance of drug use (Morgan & Grube, 1991).

Some researchers, however, argue that in most studies peer influence is overestimated, while parental influence is underestimated. This problem is related to the measurement of behavior modeling. In particular, Bauman and Ennett (1994) and Fisher and Bauman (1988) argue that peer influence is overestimated in the studies that use subjects' report of friends' behavior. They suggest that reports of friends' behavior reflect a subject's projection of his or her own behavior onto peers. Kandel (1996) further identified the sources of distortion in the estimation of peer behavior. From Kandel's point of view, most studies fail to take into account parental contributions to children's peer selection and to consider genetic contributions to parental influence.

Theory of Reasoned Action (or Planned Behavior). The theory of reasoned action assumes that (1) people are usually quite rational and make systematic use of the information available to them and (2) people consider the implications of their actions before they decide to engage in a given behavior (Ajzen & Fishbein, 1980). Based on these two assumptions, the immediate determinant of a person's actual action is his or her intention to engage in a certain behavior. Intention, in turn, is a result of the additive effects of attitudes and subjective norms toward the behavior. Attitude represents a person's evaluation of a behavior (e.g., good or bad), whereas subjective norms refer to perceived approval or disapproval by others.

The theory of reasoned action has been applied to understand a wide range of human behaviors and behavioral intentions. However, although partially supporting this theoretical framework, many studies have suggested model reformulation. One problem is with the component of subjective norms. Kilty (1978) found that personal normative beliefs were more useful than social normative beliefs in predicting drinking. Personal normative beliefs refer to the individual's judgment whether he or she should (or should not) perform a behavior. Budd and Spencer (1984) also found that when the influences of attitude and subjective norms were mediated through personal normative belief, and that the prediction of actual intention to drinking was improved when personal normative belief was included. Grube, Morgan and McGree (1986) suggest that social normative beliefs are multi-dimensional and sources of influence should be distinguished. For example, the sources of social influence for adolescents include parents and peers. It has been widely confirmed that these two types of social influence differentially affect adolescent behaviors. Grube et al. (1986) further found that when perceived behavior of others was included in the model, the

influence of normative beliefs on adolescent smoking became minimal. Perceived behavior appeared to be a better predictor than normative beliefs for both behavior and behavioral intention.

Another problem with this theoretical model lies in the relationship specified between attitude and behavior. Fishbein and Ajzen proposed that attitudes affect behavior entirely through the mediation of behavior intention. However, some studies found that attitudes had a direct impact on behaviors (Kilty, 1978). Moreover, the relationship between attitudes and behavior was found to be very inconsistent in early empirical studies. While many studies confirm the predictive power of attitudes, many other studies show no or small associations between attitudes and behavior. From Ajzen and Fishbein's (1977) point of view, studies failed to show a significant relation between attitudes and behavior (or intention) did so due to a lack of correspondence between these two variables or between behavior and behavior intention. If these two measures are correspondent, they refer to the same time frame, context and action. Ajzen and Fishbein's argument has been proved valid by empirical studies (e.g., Leigh, 1989)

Ajzen (1989) later modified and extended this theory into a Theory of Planned Behavior by adding the concept of perceived behavior control. The theory of planned behavior assumes that a person is more likely to perform a behavior if he or she believes that (1) performing a given behavior will lead to mostly favorable outcomes, (2) important others support such behavior, and (3) performing such behavior is within one's personal control based on past experience and information obtained through friends' experiences and other sources. This reformulated theoretical model appears to be valid in the prediction of excessive drinking and intention to drink excessively among undergraduate students (Wall,

Hinson & McKee, 1998).

The social learning model and planned behavior model are similar in their treating normative beliefs as one central mechanism that underlies behavior. However, in the social learning model, normative beliefs have direct impacts on behavior. Moreover, behavior, in turn, modifies normative beliefs. Whereas normative beliefs only indirectly influence behavior through intention in a planned behavior perspective.

Alcohol Expectancy Theory. Alcohol expectancy refers to the "anticipation of a systematic relationship" between drinking and specific consequences (e.g., Brown, Goldman, Inn & Anderson, 1980; Goldman, et al., 1987). Put simply, alcohol expectancies represent the anticipated effects of drinking alcohol. Consistent with social learning theory, alcohol expectancy theory posits that anticipated consequences regulate behavior. Such anticipation, in an alcohol expectancy perspective, has a direct impact on behavior. Therefore, the more a person anticipates positive consequences from drinking, the more likely the person will drink and/or drink more. Alcohol expectancy theory focuses on the cognitive process that underlies alcohol use. The association between alcohol expectancies and drinking has been consistently confirmed in experimental studies as well as questionnaire survey studies (e.g., Brown et al.,1980; Brown, Christiansen & Goldman, 1987; Christiansen & Goldman, 1983; Fromme & Dunn, 1992; Leigh, 1989; Sharkansky & Finn, 1998; Southwick, Steel, Marlatt & Lindell, 1981).

Knowledge of alcohol and drinking appears to be learned in early childhood and well-developed alcohol expectancies have been found in young children before they have direct experience with drinking (Miller, Smith & Goldman, 1990). Beliefs about drinking, however, change with age. Miller et al.'s (1990) study of children of grades 1-5 and Gillmore

and colleagues' (1998) study of 4th through 7th grade children both found that older children perceived positive outcomes more likely and negative outcomes less likely than younger children did. However, Sher, Wood, Wood and Raskin (1996) found that positive alcohol expectancies decreased over time in a longitudinal study of college students.

Studies also indicate that alcohol expectancies vary with individual differences. Brown et al. (1980) found that male drinkers tended to expect more aggression and arousal from alcohol, whereas female drinkers expected more pleasurable changes. They also found that global positive factors were closely associated with light consumption, while heavier drinking was more associated with increased expectation of sexual and aggressive behavior. They suggested that gender differences in alcohol expectancies may be an artifact of the quantity of alcohol consumed by males and females. Similarly, Southwick et al. (1981) found that positive expectancies were more closely associated with moderate drinking, whereas negative expectancies were more closely associated with excessive drinking.

Expectation of alcohol effects has been studied by some researchers with a slightly different approach that has looked at the "subjective expected utility" (SEU) of alcohol (e.g., Bauman & Bryan, 1980; Bauman, Fisher, Bryan & Chenoweth, 1985; Stacy, Widaman & Marlatt, 1990). Subjective expected utility is "the degree to which the positive consequences outweigh the negative consequences expected from behavior when the desirability and subjective probability of each consequence have been taken into account" (Bauman et al., 1980). In other words, it is the interaction term of perceived probability (expectancy) and desirability (value) of alcohol effect. Although this approach is not the most commonly used in alcohol studies, the argument that positive expectancies outweigh negative expectancies has been well received. Early alcohol expectancy studies primarily focused on positive

alcohol effects. Negative effects were later included and proved to be an important component of alcohol expectancies that also regulates drinking, especially for those young and less experienced drinkers (e.g., Chen, Grube & Madden, 1994; Leigh, 1989; Mooney, Fromme, Kivlahan & Marlatt, 1987; Stacy, et al., 1990).

Grube and colleagues (1995) speculated that the SEU approach may have underestimated the relationship between expectancy and evaluation variables and drinking because the model only considers expectancy-evaluation product terms without including the main effects for expectancy and evaluation. A regression model containing only the background variables and additive effects of expectancy and evaluation was compared to a model including only the background variables and the interaction terms for expectancy and evaluation. The results showed that, in predicting adolescent drinking, these two models were equivalent in terms of R^2, i.e., the variance in drinking explained by the model. However, Grube et al. suggested that the additive model is better because it allows for the independent effects for alcohol expectancy and evaluation. For example, in the same study, Grube et al. found that alcohol expectancies predicted adolescent drinking better than evaluations of alcohol effects did.

Studies have also found a reciprocal relationship between alcohol expectancies and drinking. Sher et al. (1996) found that not only positive expectancies predicted future alcohol use, but also alcohol use was positively related to positive expectancies measured one year later for college students. Smith, Goldman, Greenbaum and Christiansen (1995) also found that expectancy of social facilitation and alcohol use positively predicted each other for adolescents who were originally non-drinkers. However, whether alcohol use also affects future negative expectancies was not investigated.

Problem Behavior Theory. This theory was first applied to study alcohol abuse and other problem behaviors among adults. Later it was revised to study problem behaviors and psychological development in adolescents (e.g. Jessor, Graves, Hanson, & Jessor, 1968; Jessor & Jessor, 1975, 1977; Donovan & Jessor, 1978, 1985; Jessor, Donovan & Costa, 1991). According to this theory, problem behaviors are the result of personal factors (e.g., unconventionality) and the perceived social environment (e.g., modeling of drinking by others). As regards adolescent behavior, Jessor and Jessor (1975) found that onset of drinking and age of onset were closely related to developmental changes in some socio-psychological attributes. Overall, adolescent personality developed toward unconventionality. These developmental changes, however, were greater among adolescent drinkers than abstainers. Moreover, Donovan and Jessor (1978) found that adolescent problem drinkers were more likely to engage in other problem behaviors. Therefore, it is suggested by this approach that as adolescents age, their psychosocial attributes will gradually develop into the direction away from social control or conventionality. Drinking by adolescents thus should be considered as part of a general deviant behavioral syndrome.

However, results from Grube and Morgan's study (1990a) did not agree with this hypothesis of a general behavioral syndrome. In a study of Irish adolescents, Grube and Morgan did a series of confirmatory factor analyses of the items relating to substance use and other problem behaviors. The results indicated a three-factor solution for the structure of problem behavior items. The three factors corresponded to substance use (drinking, smoking, marijuana use, and other drug use), relatively minor problem behaviors (e.g., swearing and lying), and relatively serious problem behaviors (e.g., stealing, and vandalism). A second-order factor analysis indicated that the general deviance factor only accounted for

14% of the variance in substance use, whereas about 74% of the variance in both minor and serious problem behaviors were explained by the general deviance factor. Substance use thus appeared relatively independent of a general tendency toward deviance for these Irish adolescents. Grube and Morgan suggested that the association between substance use and other deviant behavior may be different in different cultural contexts.

In summary, problem behavior theory posits that personality and the perceived social environment are the major antecedents that determine behavior. Personality refers to an individual's values and expectations for achievement and independence, internal-external control, alienation, self-esteem, and personal control such as attitudinal tolerance of deviance and religiosity. Other researchers (e.g., Newcomb & Bentler, 1988) have described this pattern as representing a tendency toward either conformity or nontraditionalism. Perceived social environment refers to value compatibility between parents and friends, relative influences of parents and friends, parental supports and controls, parental attitudes toward deviance and friends' approval and modeling of deviance.

Chapter 4: Research Design and Methodology

The present study is based on secondary analyses using the data from a longitudinal survey study, i.e., the US-Irish Project. Although the US-Irish Project was a three-year panel study, only the Wave 2 (1992) and Wave 3 (1993) data were included in the data analyses for the present study. The data are briefly described as follows.

The Data

Design. The US-Irish Project was a three-year panel study. The data were collected annually during the period of 1991-1993. Sampling took two stages: (1) at each research site a sample of schools were first obtained and then specific grade levels were randomly assigned to each of the participating schools; (2) schools were stratified for gender, size and type of school. All students within each selected grade were eligible for inclusion in the study, except special education students (i.e., students with learning disabilities or limited in English proficiency).

Subjects. At the American site, subjects at the starting year were students in grade 9-12 drawn from eight public and three parochial high schools in the San Francisco Bay Area (Contra Costa, Alameda and San Mateo counties) of California[1]. The total numbers of participants in the three waves of survey were 1,926, 1,902, and 2,020. At the Irish site, students in twenty-one post-primary schools (first year through sixth year) from the greater

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1. One school withdrew from the study in the second year of the study. A new school with similar socio-demographic characteristics in the same school district was selected to replace the school that withdrew. In the same year, another school was undergoing restructuring that some students in the grade that participated in the previous year were transferred to two other schools. The school survey thus was extended to the two additional schools where students were transferred.

Dublin area (Dublin City, its suburbs and Dun Laoghaire) participated in the study during the same period of time[2]. The total numbers of participants for the three years of survey were 1,983, 2,109 and 1,629.

Surveys. The data were collected using anonymous, self-administered questionnaires that were given in the students' regular classroom or assembly setting. At least two trained research staff were present in each classroom during data collection. School teachers were asked to remain in the room for disciplinary purpose, but they neither participated in the data collection nor were allowed to observe students' responses. A small fee ($2) was paid to the American schools for each student who participated in the survey. Students were informed that participation was voluntary and were told at the beginning of the survey that the study was concerned smoking, drinking, and other drug use. Instructions were given verbally as well as in writing.

A mail survey was added to the study at the Wave 2 and 3 for those students who graduated during the course of study. Each year, students at graduating classes were told that they would be contacted by mail for one or two more follow-up surveys[3]. They were also asked to provide a permanent address where they could be reached later. Again, they were

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2. Twenty-one schools were originally contacted for this study. All but two agreed to participate. The two schools refused to participate because the grades chosen for their schools were both examination classes. Two new schools were selected to replace these two schools. However, students from one-year lower grades were surveyed in these two schools to avoid refusal for the same reason. Also, boarding schools and schools for special education were excluded.

3. Mail survey was implemented with slight difference in Ireland in the second phase of study. Mail survey questionnaires were also sent to students who were absent on the day of survey, changed school, or dropped out. In total, 194 mail surveys returned at Wave 2 were actually filled up by adolescents who still attended post-primary schools. This extra effort was not repeated at the Wave 3 survey.

told that their participation was voluntary. Each American respondent who returned the questionnaire was paid $10.

Human subjects. At the American site, the parents or guardians of each potential participant was informed by mail of the general nature of the research project. They were informed that participation of their children in this study was voluntary. A signed parental consent form that agreed to let their children to participate (i.e., active consent) was sought for each participant. This procedure was repeated at every phase of survey at the US site[4].

This consent procedure was implemented differently at Irish site because of differences in the requirements of schools regarding research that involves human subjects. Parental consent was obtained for the Irish sample only in the first year. Parents were told to return the consent form if they did not wish their children to participate (i.e., passive consent). In the first year, only two children were excluded from participating the survey because of parental refusal. Further parental consents were not sought for the school surveys in the next two years.

Students were informed of the general purpose of this study and the data collection procedure at the beginning of each data collection session. They were also told that their participation was voluntary and that they could refuse to participate or to answer specific questions. In the case of mail surveys, written parental permission was not sought. Instead, information about the study was provided in a cover letter and in a written fact sheet that accompanied the mail survey.

Response rates. The active consent procedure had a negative impact on the survey

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4. At the third phase of survey, active consent was sought for students in three schools, and passive consent was sought for the other four schools.

response rates at the American site. In the 1991 survey, 64% of the parents of the eligible students agreed to let their children participate in the study. The consent rates were 66% and 65% in the 1992 and 1993 surveys, respectively. Consequently, the response rates for the school survey were 56%, 59% and 53% for the three years. The response rates for the mail survey for the American sample were 70% in 1992 and 73% in 1993. Response rates for the Irish sample were not calculated because information on total number of eligible students for each survey was not available. However, based on the personal communication with the principal investigator in Ireland, Dr. Morgan, all students who attended school on the day of survey were given questionnaires except two students in the first year (please refer to Appendix A for more information on survey administration at the American site).

Matching Panel Data

In order to maintain anonymity and encourage truthful responses, no names were associated with the surveys. A special technique was used to link questionnaires over three surveys. Questionnaires were matched across three surveys using a self-generated identification code (Grube, Morgan, & Kearney, 1989; Kearney, Hopkins, Mauss, & Weisheit, 1984). Self-generated identification codes consist of stable personal information provided by the respondents themselves. This matching method was used previously in a longitudinal school study in Ireland. Seven elements were included in this Irish study: gender, month, day and year of birth, number of older brothers, number of older sisters, and first initial of mother's first name. This method was able to match exactly 60% of the questionnaires over two phases at one-month interval and 62% one year later. The success rate went up to 75% and 77% respectively, if off on one element was allowed (Grube, et al., 1989; Grube & Morgan, 1990b).

In the present study, the self-generated identification code comprised eight elements: gender, month, day and year of birth, number of older brothers, number of older sisters, first letter of mother's first name, and first letter of respondent's middle name. Questionnaires were matched within each school. Initial results showed that 819 (47%) of the US Wave 1 subjects (excluding the 192 cases from the school that withdrew) were exactly matched with the subjects at Wave 2 and 958 (50%) between Wave 2 and 3. The success rate went up to 61% and 68%, respectively, if off on one element was allowed. The success rates for the Irish sample were 50% and 37% for exact match and 73% and 56% when off-1 were included. The relatively low success rate between Wave 2 and 3 for the Irish sample was probably due to the difference in survey administration between the two years. Students who were absent, dropped out or changed school were also surveyed at Wave 2, but not at Wave 3. Overall, this initial result was relatively poor, compared to the previous studies (Grube, et al., 1989; Grube & Morgan, 1990b).

The second stage was to examine the remaining unmatched questionnaires on their mismatched items. It was found that many mismatches were due to missing data on the matching elements, especially on items of older siblings. This problem was more severe in the Irish sample. The most often-seen problem was that the respondent reported having "0" older brother or sister in one year and left blank on these items in the other year. The second frequent problem was that items on brother or sisters were left blank in either year. Therefore, if "blank" is considered "0" for such mismatches, many of the "off on 2 or more" cases were, in fact, exactly matched or mismatched on fewer elements.

In addition, at the American site, a numerical code was given to the mail survey questionnaires at the second wave of survey. The respondent who received mail survey at

Wave 2 received their Wave-3 mail survey questionnaire with the same numerical code stamped on it. Therefore, if Wave 2 and 3 questionnaires were both mail surveys, the questionnaires were matched by the numerical code stamped on the questionnaires. As a result, 36 cases between Wave 2 and 3 American surveys were actually completed by the same respondents, although they mismatched on 3 elements or more.

Therefore, "off two" was used as the general rule to determine the matching status of questionnaires over three years. However, further efforts were made to ensure the quality of this matching procedure and also to obtain more matched cases. The data on relatively stable personal information such as ethnicity (US only), parents' education, religion, first age of smoking, and first age of drinking beer over three panels were compared for potential matched cases. Some "off more than 2" cases were later determined to be "matched" because consistencies were found in their answers on the additional items across panels.

As a result (Table 4-1), for the American sample, 1,175 cases (68%) were matched between Wave 1 and 2, and 1,469 (77%) cases between Wave 2 and 3. Across the three waves of survey, 967 (50% of the first year sample) subjects had 3-year data at the American site. For the Irish sample, 1,738 cases (88%) were matched between Wave 1 and 2, 1,493 cases (71%) between Wave 2 and 3, and 1,334 (67% of the first year sample) of the Irish sample had 3-year data. Overall, the success rates were higher for the Irish sample.

Table 4-1 : Number of cases in each year and results of matching by survey site

	US			IRISH		
	T1	T2	T3	T1	T2	T3
N	1926	1902	2020	1983	2109	1629
Matched	1175		1469	1738		1493

Selection Bias

Selectivity is a potential problem for panel study due to sample attrition. Unknown biases can result from non-random loss of respondents. For example, in the case of the school survey, absenteeism and dropout are the two major sources of selection bias. In addition, consent procedure implemented at the American site added approximately 40% loss of potential participants. Moreover, the matching procedure performed to link questionnaires may have made the final samples even more biased. Therefore, the participants may differ from those who did not participate and the matched subjects may differ from those non-matched. Also, lenience in the criteria for inclusion in the matching procedure may have resulted in mismatching in the panel data. Therefore, three sources of potential biases may threaten the representation of the subjects used in the data analyses for the present study. Because the surveys were anonymous, it is not feasible to compare the participants against non-participants. However, differences between the matched and non-matched and within the matched subjects can be examined. The major concern was whether the matched and non-matched subjects differed in their drinking patterns.

Drinking. Differences in behavioral measures such as frequency of drinking in the past 12 months, frequency of drinking in the past 30 days, usual quantity consumed for drinkers were examined for the matching groups (i.e., "exact", "off-1", "off-2", "off-3+" and "unmatched") using analyses of variance (one-way ANOVA with fixed-effect model). Table 4-2 summarizes the results of the analyses. The results indicated that none of the differences among these matching groups on the drinking measures were statistically significant for either sample. However, the tests of homogeneity of variances indicated that the variances in measures of frequency of drinking in the past 12 months and frequency of drinking in the

past 30 days for the American sample were heterogeneous among the matching groups. In addition, the numbers of cases in all matching groups were not similar. Therefore, these two measures were examined again using the Kruskal-Wallis test. The further tests consistently showed no significant difference across groups.

Table 4-2: Comparisons of drinking behaviors for the matching groups

US sample	Test	Results	
Frequency of drinking			
past 12 months	Kruskal-Wallis	χ^2 (4) = .84	p = .93
past 30 days	Kruskal-Wallis	χ^2 (4) = 7.78	p = .10
Usual quantity consumed	One-way ANOVA	$F_{(4,1353)} = 1.09$	p = .36
IRISH sample	**Test**	**Results**	
Frequency of drinking			
past 12 months	One-way ANOVA	$F_{(4,1632)} = 2.12$	p = .08
past 30 days	One-way ANOVA	$F_{(4,1330)} = 1.03$	p = .38
Usual quantity consumed	One-way ANOVA	$F_{(4,1632)} = .87$	p = .48

Other substance use. In contrast to drinking, the χ^2 tests indicated that the five matching groups differed in the prevalence rate of daily smoking in the past 30 days and in prevalence of illicit drug use in the past 12 months (Table 4-3). In general, the "exact" group was less likely than the other groups to engage in daily smoking or illicit drug use.

The prevalence rates of daily smoking for the three off-matched groups were higher than that for the unmatched group in the American sample. However, the prevalence rate for the combined matched sample (9.3%) was similar to that for the total sample and did not differ significantly from the 9.8% for the unmatched group [χ^2 (1) = .11, p = .74]. Whereas

Table 4-3: Percentages of subjects reporting daily smoking and yearly illicit drug use by matching group and sample

	Group					
	Exact	Off-1	Off-2	Off-3	Unmatched	Total
	Daily smoking in the past 30 days					
US	7.4	11.3	16.7	13.7	9.8	9.4
(N)	(948)	(318)	(126)	(51)	(428)	(1871)
IRISH	21.6	26.4	26.5	34.2	35.7	27.6
(N)	(776)	(383)	(238)	(73)	(591)	(2061)
	Yearly illicit drug use					
US	31.1	34.4	37.8	41.5	27.7	31.3
(N)	(958)	(331)	(127)	(53)	(628)	(2097)
IRISH	29.2	35.1	34.0	40.0	37.3	33.6
(N)	(789)	(385)	(244)	(75)	(654)	(2147)

in the Irish sample, the prevalence rates of daily smoking increased with number of off-matched elements and the unmatched group had the highest prevalence of daily smoking. The prevalence rate for the combined matched group sample (24.3%) was slightly lower the 27.6% for the total sample and much lower than the 35.7% for the unmatched group [χ^2 (1) = 27.51, $p < .001$].

The prevalence rates of any illicit drug use in the past 12 months for the three off-matched groups in the American sample were higher than that for the unmatched group. The prevalence rate for the combined matched sample (32.8%) was close to that for the total sample (31.3%), but significantly higher than the 27.7% for the unmatched group [χ^2 (1) = 5.33, $p < .03$]. For the Irish sample, the prevalence rates of the yearly illicit drug use for the three off-matched groups were similar to that for the unmatched group. However, the prevalence rate for the combined matched group sample (32.0%) was slightly lower that for

the total sample (33.6%), but lower than the 37.3% for the unmatched group [χ^2 (1) = 5.71, p < .017].

In summary, it appears that subjects with different matching status did not differ significantly in their drinking practice. However, they differed in the use of other substances. Nevertheless, the combined matched samples were similar to the total samples in these behaviors, indicating that the matching procedure did not result in appreciable bias for either sample.

Statistical techniques for dealing with selection biases exist (e.g., Heckman, 1979; Hennessy & Saltz, 1989; Muthén & Jöreskog, 1983). The present study used an approach that first modeled the selection process and then included an instrumental variable representing this process as a predictor in the primary analyses. It was included as a predictor of each endogenous variable in the analysis to adjust for potential sample biases resulting from attrition.

Probit analyses were performed to model attrition between panels based on the Wave 2 (1992) data. This analysis also took into account the differential response rates of the two data collection methods (i.e., mail vs. school). The predictors included in this analysis were gender, age, number of cigarette smoked per day in the past 30 days, frequency-quantity drinking, frequency of heavy drinking and intoxication, mean frequency over nine kinds of illicit drug use in the past 12 months in 1992 survey, and survey type in the 1993 survey (mail vs. classroom). Ethnicity (Caucasian American vs. others) was also included in the model for the American sample. An inverse Mills ratio was calculated for each respondent based on the probit model. The inverse Mills ratio is a predicted probability of being retained in the sample over the panels and represents the underlying selection process.

Data Analysis Design

The American and Irish samples were expected to differ in three ways. First, Irish and American adolescents were predicted to differ in their drinking behavior in terms of prevalence, frequency of drinking and usual quantity consumed. That is, it was hypothesized that Irish adolescents were predicted to have higher prevalence rates of lifetime, yearly and monthly drinking than do American adolescents. Moreover, Irish drinkers were predicted to drink more and more often than do American drinkers. Second, a greater gender difference in drinking was expected in the Irish sample than in the American sample. Third, they were predicted to differ in the personal and environmental factors that are hypothesized to predict drinking in each of the behavior theories. That is, Irish adolescents were predicted to be less unconventional in their personality and perceived stronger social disapproval of their drinking compared to American adolescents. The differences in these aspects were examined using a series of analyses of variance and logistic regression analyses. And fourth, the relationships between personal factors, environmental factors and behaviors were different for the two samples. No direction was hypothesized for the differences in these interactive relationships between the two samples, rather, this aspect of the present study is considered exploratory. To better reveal the gender difference in drinking and the relationship in each of the models, the subjects were divided into four groups, American boys, American girls, Irish boys and Irish girls. Model estimation was performed separately for the four groups and multi-group modeling was then undertaken.

The utility of the central concepts from the four theories was then assessed. The data analyses followed the theoretical framework provided by each behavior theory. The alcohol expectancy model assessed the predictive power of alcohol expectancies and alcohol values.

The social learning model tested whether expectancies and values, modeling, and subjective norms predict drinking. The planned behavior model tested whether attitudes, subjective norms, and "perceived behavioral control" affected drinking. Measures of expectancies and values were used as attitudes in this model. The problem behavior model assessed the predictive power of some concepts (i.e., religiosity, unconventionality and self-esteem) proposed by the problem behavior theory. The association between general deviance and drinking was also examined. Finally, a reformulated social learning model was constructed by integrating the findings of the four models using Bandura's (1977, 1986) social learning model as the basis.

Simultaneous structural equation analyses, using the maximum likelihood procedure from EQS 5.7 (Bentler, 1997), were used for the primary analyses. Separate simultaneous structural equation modeling was first performed for each of the four groups. Although the four theoretical models were estimated with slight differences, the initial model, in general, was a cross-lagged panel design that contained all possible structural paths regardless of their statistical significance. Age and the inverse Mills ratio were included in all equations to adjust for the age differences between the two samples and for any bias due to attrition within each sample. All baseline variables were allowed to covary freely with one another. The covariances among the residuals of all dependent variables were also included in the model. A multi-group analysis was then undertaken to test the equivalence of the model across the four groups. Cross-group equality constraints were placed on all structural paths in the model, except those from Mills ratio to the dependent variables. That is, the baseline model assumed all of the effects of the theoretically important variables were equivalent for the four groups. Lagrange Multiplier (LM) tests were then used to evaluate the reasonableness each

equality constraint. The equality constraint associated with the largest significant χ^2, ($p <$ .05), was released first and the model was re-estimated. This procedure was repeated until all of the unreasonable equality constraints were released from the model.

Chapter 5: Adolescents and their Drinking

The Actors: Sample Characteristics

Strictly speaking, the 1992 subjects in the US-Irish Project consists of adolescents and young adults. The legal age for adulthood and to drink is 18 years old in Ireland. Therefore, many of the participants who graduated from post-primary schools between the first and second waves of survey had become "adults" and could legally drink. The definition of adulthood is somewhat ambiguous in the United States. The legal age to vote and go to war is 18 years. Persons over age 18 are tried as adults for their criminal conducts. However, the legal drinking age is 21 years. Therefore, for many participants, although being able to vote or go to war, as long as they were younger than 21 years old, they were not legally allowed to drink alcohol.

Two subjects in the American sample in the 1992 data had passed age 21 and another 31 subjects would be 21 years old sometime in 1993. In Ireland, among the 1992 subjects, 355 (16.8%) had passed age 18 and another 485 subjects (23%) would reach age 18 in 1993. However, only one subject were older than 21 years in 1992 and another 11 subjects would become 21 years old in the next year. In order to have subjects with more compatible age structure between the two samples, no subjects were excluded from the data analyses because of their adult status. However, data analyses would take in account of this difference of legal status. Also, subjects included in this study were generally called "adolescents" regardless of their adult status. The following compares characteristics of the two samples in the baseline data sets (i.e., the 1992 data) that are relevant to the present study.

Demographics. The gender, age, ethnicity, religion, parents' education and family

SES of the 1992 samples are presented in Table 5-1. Subjects were evenly split between boys and girls in each sample. However, the Irish sample was approximately 1 year younger than the American sample. As is expected, the Irish sample was entirely Caucasian, whereas the American sample was heterogeneous in ethnic background. Also, in the American sample, about half of the sample were Catholic and another half reported other or no religion, whereas the Irish sample were predominantly Catholic.

The American sample reported a similar level of educational achievement for father and mother, whereas the Irish sample reported a slightly higher educational achievement for father than for mother. The family SES measure was a subjective evaluation by the respondent. The respondent was asked how rich or poor his or her family was, in comparison with other families in the nation. Slightly more of the Irish sample reported that their families were "about average" than did the American sample, whereas more of the American sample reported "above average" than did the Irish sample.

Table 5-1: Baseline demographics

	US	IRISH		US	IRISH
Gender			Father's education	14.4 years	12.6 years
Male	49.1%	48.3%	Mother's education	14.0 years	11.9 years
Female	50.9%	50.9%			
			Religion		
Age (mean/years)	17.6	16.4	Catholic	48.3%	84.9%
			Other	31.1%	10.5%
Ethnicity			No religion	20.6%	4.6%
White	56.0%	100%			
Black	4.3%		Family SES		
Asian	16.0%		Above average	52.3%	46.4%
Latino	11.9%		About average	34.3%	41.4%
Mixed	8.5%		Below average	12.4%	8.8%
Other	3.3%				

The Behavior: Drinking

Measures. Lifetime drinking, age at first drink for each alcoholic beverage, beverage-specific frequency of drinking in the past 12 months and past 30 days, frequency of heavy drinking (i.e., five drinks in a row) and intoxication in the past 12 months and past 30 days were measured. Usual quantity of consumption of each alcoholic beverage in a typical drinking occasion was also obtained.

Prevalence of drinking. Table 5-2 presents the percentages of adolescents in each sample reporting drinking in their lives, in the 12 month as well as in the 30 days prior to survey. Prevalence rates were further examined using logistic regression analyses, adjusting for differences in age. Gender (male = 1) and sample (US = 1) were coded as dummy variables for the analyses. A hierarchical approach was used in which the main effects for sample, gender and age were first entered into the equation, followed by the two-way and three-way interactions. The incremental χ^2s were examined to determine whether the additional step improves the fit of model. The age-adjusted prevalence rates are presented in Table 5-3 and the results of logistic regression analyses are summarized in Table 5-4.

As is shown in Table 5-3, overall, more of Irish adolescents than American adolescents reported using alcohol in the three time periods of interest. When a simple main effect model is considered, the Irish sample was more likely to drink and drink heavily than was the American sample. The main effects, however, were qualified by significant sample by gender and sample by age interactions. As is shown in Table 5-4, the significant sample x gender effect in the prediction of prevalence of lifetime and yearly drinking indicated that the differences between the two male groups were greater than the two female groups. In contrast with the literature (Morgan & Grube, 1994), this study did not find a greater

Table 5-2: Percentages of adolescents reporting drinking by sample, gender and age

Drinking	U.S. age group											
	≤ 15		16		17		18		≥ 19		Total	
	M	F	M	F	M	F	M	F	M	F	M	F
In life time	63.4	74.3	71.8	76.8	82.7	82.0	82.9	87.8	86.8	80.3	79.1	80.5
In the past year	59.8	64.9	60.3	67.7	74.7	75.8	73.9	79.6	79.3	71.1	70.4	72.1
In the past 30 days												
Ever drank	36.6	39.2	36.9	39.2	58.0	46.4	52.1	56.1	63.4	54.9	50.4	46.8
Feeling drunk	12.2	18.9	19.0	17.5	38.9	25.8	35.1	34.8	48.9	32.4	32.8	25.5
5+ drinks in a row	11.0	7.4	17.1	10.3	35.2	19.1	35.1	21.7	46.3	22.5	30.8	16.0

Drinking	IRISH age group											
	≤ 14		15		16		17		≥18		Total	
	M	F	M	F	M	F	M	F	M	F	M	F
In life time	71.6	68.7	81.3	70.8	82.3	85.8	93.3	89.4	96.0	96.9	84.8	80.7
In the past year	65.3	61.1	73.5	66.7	76.1	83.1	89.9	86.5	94.2	96.1	79.6	76.6
In the past 30 days												
Ever drank	57.2	50.5	65.2	61.2	70.6	72.3	83.2	77.9	91.1	93.0	73.2	68.5
Feeling drunk	27.0	24.4	34.8	30.1	46.6	37.2	59.8	45.5	65.8	61.2	46.2	37.7
5+ drinks in a row	21.6	16.0	29.6	18.7	41.1	32.4	58.1	34.3	68.0	48.8	43.2	27.9

Table 5-3: Age-adjusted prevalence rates of drinking by sample and gender

Prevalence of drinking	US		IRISH	
	Male	Female	Male	Female
In life time	75.8	79.3	90.6	86.9
In the past 12 months	66.8	70.6	86.3	83.8
In the past 30 days				
Ever drank	45.2	44.2	79.9	75.9
Feeling drunk	26.5	21.4	49.8	42.8
Having 5+ drinks in a row	22.8	12.9	47.9	31.5

Table 5-4: Logistic regression predicting prevalence of drinking

	b	S.E.	Wald test	p
Lifetime drinking				
Sample	4.20	1.07	15.45	.000
Gender	-1.36	1.01	1.81	.179
Age	.47	.05	80.48	.000
Sample x gender	-.58	.20	8.28	.004
Sample x age	-.28	.06	19.07	.000
Drinking in the past 12 months				
Sample	4.77	.95	25.26	.000
Gender	-.92	.90	1.04	.307
Age	.49	.05	101.01	.000
Sample x gender	-.38	.18	4.38	.036
Sample x age	-.33	.06	32.91	.000
Drinking in the past 30 days				
Sample	2.43	.85	8.16	.004
Gender	-.59	.81	.52	.471
Age	.44	.04	104.28	.000
Sample x gender	-.19	.16	1.34	.247
Sample x age	-.23	.05	19.82	.000
Feeling drunk in the past 30 days				
Sample	-1.01	.08	175.30	.000
Gender	.28	.07	16.67	.000
Age	.35	.02	209.16	.000
Sample x gender				n.s.
Sample x age				n.s.
5+ drinks in a row, past 30 days				
Sample	-1.14	.08	190.55	.000
Gender	.69	.07	86.90	.000
Age	.42	.03	253.54	.000
Sample x gender				n.s.
Sample x age				n.s.

gender difference for the Irish sample. Moreover, the sample x age effect indicated that more of the older adolescents than younger adolescents in the Irish sample reported lifetime and yearly alcohol use. The significant sample x age effect in the analysis of monthly drinking also indicated that older adolescents than younger adolescents in the Irish sample were more likely to use alcohol in this time period.

Prevalence of excessive drinking (i.e., 5 drinks or more in a row) and intoxication was also examined. In line with the stereotyped Irish drinking, more of Irish Adolescents than American adolescents reported engaging in heavy drinking and feeling drunk more often during the 30 days prior to the survey. In addition, in general, boys than girls and older adolescents than younger ones were more likely to report excessive drinking and problem drinking.

Age at first drink. The age at first drink of any alcoholic beverage was examined using a 2 (sample) by 2 (gender) analysis of variance, adjusting for age. Age effect was assessed first, with main effects of sample and gender assessed after adjusting for age. The results and the age-adjusted mean age at first drink are summarized in Table 5-5. Overall, the two samples did not differ in this aspect. However, boys started drinking at a younger age than did girls in either sample.

Frequency of drinking. Only those who reported drinking at least once in the time period of interest were included in the analyses. Because the data were positively skewed, frequency measures were log transformed prior to analyses to reduce the influence of extreme scores. The results of the variance analyses and the anti-logs of the age-adjusted means (anti-log) for frequency of drinking in two time periods are summarized in Table 5-5. Overall, Irish adolescents drank more often than did American adolescents. In addition, boys

Table 5-5: Analyses of covariance and age-adjusted means for age at first drink, frequency of drinking and usual quantity consumed

Effect	F	d.f.	p	Age-adjusted Mean
Age at first drink				
Sample	.17	1,2435	.678	US boys=14.12
Gender	43.54	1,2435	.000	US girls=14.48
Age (β = .44)	527.78	1,2435	.000	Irish boys=14.04
Sample x gender	2.21	1,2435	.137	Irish girls=14.63
Frequency of drinking, past year				
Sample	220.14	1,2976	.000	US boys=12.6
Gender	58.37	1,2976	.000	US girls= 8.1
Age (β = .33)	330.58	1,2976	.000	Irish boys=23.6
Sample x gender	3.81	1,2976	.051	Irish girls=18.2
Frequency of drinking, past 30 days				
Sample	74.80	1,2248	.000	US boys=3.9
Gender	44.26	1,2248	.000	US girls=3.2
Age (β = .25)	138.13	1,2248	.000	Irish boys=4.7
Sample x gender	1.82	1,2248	.177	Irish girls=4.1
Usual quantity consumed				
Sample	13.01	1,2985	.000	US boys=3.0
Gender	70.29	1,2985	.000	US girls=2.5
Age (β = .13)	48.57	1,2985	.000	Irish boys=2.7
Sample x gender	5.23	1,2985	.022	Irish girls=2.5

than girls and older adolescents than younger adolescents drank more frequently in either sample.

Usual quantity consumed. Quantity of drinking was also examined using an analysis of variance, adjusting for age. Similarly, measure of quantity was log transformed prior to data analyses. The results (see Table 5-5) showed that on average, American drinkers consumed greater amount of alcohol per typical drinking occasion than Irish drinkers. In addition, male drinkers than female drinkers and older drinkers than younger ones consumed more alcohol per drinking occasion. The results also indicated that the gender differences in quantity were greater among American drinkers than among Irish drinkers.

In summary, although the Irish sample, on average, were younger than the American sample, drinking was more prevalent in the Irish sample than in the American sample. In addition, more of the Irish sample were current drinkers (i.e., drinking in the past 30 days). This may be due to the lower minimum drinking age in Ireland. The Irish sample also reported drinking more frequently yearly and monthly. Also, more of the Irish sample engaged in excessive drinking in the 30 days prior to the survey. Boys and girls differed in terms of quantity consumed. Boys in each sample reported engaging in heavy drinking and feeling drunk more frequently than girls did.

Modeling Selection Bias for the Panel Data

Because of the longitudinal design of this study, only those cases with completed surveys in the two years were included in the further analyses. The total number of cases in the Wave 2-3 panel data for the present study before excluding any case with missing data were 1,469 cases in the American sample and 1,493 cases in the Irish sample.

The probit analysis for American sample showed that this panel sample were significantly more likely to be female, younger in age, Caucasian American, and drank slightly less, compared to the Wave 2 baseline data. In addition, those who received a mail survey at Wave 3 were more likely to remain in the sample. Smoking, heavy drinking, intoxication, and illicit drug use did not significantly contribute to this selection bias. The Irish sample that retained in the survey tended to be female, younger in age, smoked less and used other illicit drugs less frequently. Mail survey participants were also more likely to retain in the sample. Subjects in the panel data did not differ from those not in the panel data in terms of drinking. Table 5-6 summarizes the significant effects in the prediction of selection bias. The inverse Mills ratio was computed for each sample and was included in

the analyses in order to adjust for the selection bias.

Table 5-6: Predicting selection bias for the panel data

US					IRISH				
Predictors	B	S.E.	T	p	Predictors	B	S.E.	T	P
Constant	2.50	.72	3.48	<.001	Constant	2.57	.55	4.69	<.001
Male	-.15	.07	-2.21	<.05	Male	-.19	.06	-3.04	<.01
Age	-.08	.04	-2.13	<.05	Age	-.07	.03	-2.32	<.05
School	-.72	.11	-6.70	<.001	School	-.86	.10	-8.40	<.001
White	.25	.07	3.56	<.001	Smoking	-.36	.08	-4.59	<.001
Drinking(Q-F)	-.10	.03	-3.26	<.01	Drugs	-.22	.09	-2.61	<.01

Chapter 6: Applications of Four Behavior Theories

Drinking behavior was represented by an index of frequency-quantity. First, overall indicators for frequency of drinking (FREQ) were calculated for each beverage by converting the monthly frequency measures to a 12-month metric and then taking the mean of the monthly and yearly measures. Beverage specific quantity-frequency indices (Q-F) were computed by multiplying FREQ for each beverage by the quantity of that beverage usually consumed. Because these drinking measures were positively skewed, they were log-transformed prior to further analyses. Consumption of five alcoholic beverages (beer, wine, wine cooler, spirits and cider) was measured at the Irish site. Wine and wine cooler were combined because wine cooler consumption was relatively low in Ireland. These beverage-specific logged measures were then subjected to a principal axis factor analysis for each sample. The analyses suggested that a single factor could adequately represent these measures. Standardized Bartlett factor scores were calculated to represent Q-F drinking at each wave and for the two samples. Table 6-1 presents the results of the factor analyses.

Table 6-1: Factor pattern matrix for Q-F drinking measure

US			IRISH		
Beverage	1992	1993	Beverage	1992	1993
Liquor	.865	.848	Liquor	.809	.755
Beer	.778	.753	Beer	.719	.701
Wine	.652	.629	Wine	.613	.571
Wine cooler	.684	.648	Cider	.608	.512
% variance explained	56%	53%	% variance explained	48%	41%

A. Alcohol Expectancy and Value Model

This model tests the causal relationship between alcohol expectancies, values and drinking. Alcohol expectancies were measured with a series of 5-point scales. The respondents were asked how likely (very unlikely -- very likely) they thought it was, for them personally, that having 2 or 3 drinks of any alcoholic beverage would lead to each of 5 positive consequences (feel relaxed, feel happy, forget problems, feel outgoing, have fun) and 5 negative consequences (get into trouble with police, get a hangover, harm health, do something they'd regret, feel sick). Alcohol values measured the desirability of consequences of drinking by asking respondents to indicate on 7-point scales how much they would like it or dislike it (dislike very much--like very much) if each of the consequences happened to them. Reliability for each of these scales is presented in Table A-1.

Table A-1: Alcohol expectancies and values: scale reliability

	1992 data		1993 data	
Scales	US	IRISH	US	IRISH
Positive expectancy	.84	.78	.86	.79
Negative expectancy	.83	.83	.84	.83
Positive value	.92	.87	.92	.88
Negative value	.80	.80	.84	.80

A series of 2 (sample) by 2 (gender) analyses of variance, adjusting for age, were performed to each of the alcohol expectancy and value item to examine whether Irish and American adolescents differed in their alcohol expectancies and values. The results of analyses of covariance are summarized in Table A-2 and age-adjusted mean scores for expectancy and value items are presented in Table A-3.

Positive alcohol effects. Irish adolescents generally perceived positive consequences of drinking as more likely than did American adolescents. They also evaluated positive

Table A-2: Analyses of covariance for alcohol expectancy and value items

Expectancy	Effects											
	Sample			Gender			Age			Sample x Gender		
	F	d.f.	p	F	d.f.	p	β	t-value	p	F	d.f.	p
Feel relaxed	12.40	1,3940	.000	1.72	1,3940	.190	.19	11.4	.000	17.99	1,3940	.000
Feel happy	47.41	1,3935	.000	9.84	1,3935	.003	.03	2.0	.043	5.86	1,3935	.016
Worry less	.62	1,3943	.430	1.94	1,3943	.163	-.11	-6.1	.000	6.06	1,3943	.014
Feel outgoing	8.31	1,3952	.004	14.15	1,3952	.000	.04	2.3	.023	10.95	1,3952	.001
Have fun	40.42	1,3946	.000	7.41	1,3946	.011	.00	.1	.904	10.61	1,3946	.001
Troubled w/ police	158.65	1,3951	.000	10.49	1,3951	.001	-.32	-19.4	.000	1.89	1,3951	.170
Harm health	96.77	1,3934	.000	26.51	1,3934	.000	-.27	-16.2	.000	2.95	1,3934	.086
Hangover	122.41	1,3950	.000	34.39	1,3950	.000	-.27	-16.4	.000	.17	1,3950	.683
Do things regret	158.41	1,3951	.000	5.64	1,3951	.017	-.28	-17.2	.000	.06	1,3951	.813
Feel sick	209.78	1,3949	.000	79.67	1,3949	.000	-.29	-17.8	.000	1.40	1,3949	.236

Value	Effects											
	Sample			Gender			Age			Sample x Gender		
	F	d.f.	p	F	d.f.	p	β	t-value	p	F	d.f	p
Feel relaxed	6.17	1,3945	.013	6.09	1,3945	.014	.06	3.61	.000	9.79	1,3945	.002
Feel happy	9.93	1,3932	.002	.34	1,3932	.561	.01	.54	.591	8.45	1,3932	.004
Worry less	.61	1,3939	.433	10.92	1,3939	.001	-.06	-3.75	.000	7.39	1,3939	.007
Feel outgoing	4.67	1,3934	.031	.05	1,3934	.820	-.00	-.01	.992	3.75	1,3934	.053
Have fun	30.82	1,3929	.000	.32	1,3929	.570	.02	1.28	.199	4.93	1,3929	.026
Troubled w/ police	20.39	1,3950	.000	70.14	1,3950	.000	-.08	-4.95	.000	.52	1,3950	.473
Harm health	4.18	1,3938	.041	21.33	1,3938	.000	-.07	-4.00	.000	.52	1,3938	.472
Hangover	43.82	1,3930	.000	21.39	1,3930	.000	-.03	-1.66	.096	.01	1,3930	.923
Do things regret	4.52	1,3931	.034	86.41	1,3931	.000	-.03	-1.94	.053	.04	1,3931	.835
Feel sick	1.19	1,3939	.275	35.76	1,3939	.000	-.07	-3.99	.000	.44	1,3939	.505

Table A-3: Age-adjusted means for alcohol expectancy and value items

Expectancy	Age-adjusted mean			
	US		IRISH	
	Male	Female	Male	Female
Feel relaxed	3.44	3.64	3.73	3.62
Feel happy	3.48	3.66	3.81	3.83
Worry less	3.39	3.53	3.45	3.41
Feel outgoing	3.48	3.73	3.70	3.72
Have fun	3.52	3.71	3.84	3.83
Trouble with police	2.51	2.34	1.96	1.89
Harm health	3.09	3.24	2.59	2.87
Hangover	2.93	3.20	2.43	2.67
Do something regretful	3.19	3.27	2.65	2.75
Feel sick	2.99	3.40	2.40	2.71
	US		IRISH	
Value (Desirability)	Male	Female	Male	Female
Feel relaxed	5.50	5.52	5.74	5.51
Feel happy	5.52	5.67	5.78	5.69
Worry less	5.29	5.58	5.38	5.41
Feel outgoing	5.23	5.33	5.43	5.35
Have fun	5.74	5.81	6.08	5.97
Trouble with police	1.35	1.14	1.51	1.26
Harm health	1.44	1.28	1.48	1.37
Hangover	1.67	1.51	1.90	1.75
Do something regretful	1.71	1.39	1.77	1.47
Feel sick	1.71	1.51	1.47	1.57

alcohol effects as more desirable than did American adolescents. Irish boys, in comparison with Irish girls, viewed positive effects either more or equally likely and desirable, whereas American boys generally perceived them as less likely and less desirable than did American girls. The age effect was significant only in some items. Thus, for example, the likelihood and desirability increased with age for "feel relaxed" but decreased with age for "worry less". Older adolescents rated "feel happy" and "feel outgoing" as more likely than did younger ones, but adolescents of all ages equally desired these two effects. Finally, perceived

likelihood and desirability for "have fun" did not vary with age.

Negative alcohol effects. American adolescents generally perceived negative alcohol effects as more likely to happen and evaluated them as less desirable than did the Irish sample. Boys generally perceived negative consequences of drinking as less likely and evaluated them as more desirable than did girls. However, boys perceived "trouble with police" as more likely and more undesirable than girls did. The subjective likelihood of all of the negative expectancies decreased with age. Overall, older adolescents perceived negative expectancies as less likely than younger adolescents did. Adolescents of all ages evaluated "hangover" and "do something regret" equally undesirable, whereas older adolescents viewed "trouble with police", "harm health" and "feel sick" as more undesirable than did younger adolescents.

Structure of alcohol expectancy and values. The alcohol expectancy and value scales were then subjected to a principal axis factor analysis with oblique rotations to investigate the underlying structure. Separate factor analyses were performed for the four groups (i.e., gender by sample) and for two waves of the survey. The factor analysis resulted in a 2-factor solution for each of the scales, corresponding to positive expectancies, negative expectancies, positive values, and negative values (see Appendix B for the factor structure pattern). The coefficients of congruence (Harman, 1976) for corresponding factors were calculated for boys against girls within each sample and American against Irish in each gender. They were all .98 or greater, indicating a high similarity of the factor structures for boys and girls and across the two cultures. Standardized Bartlett factor scores were calculated to represent alcohol expectancy and value factors in the further analyses.

Commonality analyses (Pedhazur, 1982) were then performed to examine the unique

contributions of the expectancy and value variables to the prediction of changes in drinking between the survey waves. Age and the inverse Mills ratio were also included in the regression equations as control variables. Table A-4 summarizes the results of the commonality analyses. Not surprisingly, the changes in R^2 indicated that (1) the unique contribution of Q-F drinking (i.e., stability) was greater than that of alcohol expectancies and values for all four groups; (2) alcohol expectancies and values resulted in a significant R^2 increase over and above earlier drinking for all four groups; (3) the effect of expectancies and values was primarily a result of expectancies for all groups; and (4) positive alcohol expectancies were more influential than negative alcohol effects for the two male groups, whereas influences of positive alcohol expectancies and negative alcohol expectancies were about equal for the two female groups.

Table A-5 presents the matrix of bivariate correlation for the variables in the alcohol expectancy model. All of the relationships are in the expected direction. In general, the cross-sectional correlation coefficients between Q-F drinking and alcohol expectancies and values were slightly greater in the baseline year (T1) for the four groups. The alcohol expectancy and value variables measured at T1 were substantially related to Q-F drinking at T2. Some of these cross-lagged correlation coefficients were even greater than the cross-sectional correlation coefficients at T2.

The alcohol expectancy and value model was then separately estimated for each group using simultaneous structural equation modeling from EQS. This model measured the stability of each variable as well as the cross-lagged effects between variables over one year lag. Equality constraints were placed across the four groups on every structural path in the initial model (Table A-6) except for the inverse Mills ratio. That is, these models assumed

Table A-4: Commonality analyses for variables in alcohol expectancy and value model

Procedure	R^2 change	F change	d.f.	Sig. of F change
US male				
1. exp., values, age, Mills	.331	54.356	(6,660)	.000
+ Q-FT1	.188	256.916	(1,659)	.000
2. age, Mills, Q-FT1	.492	214.379	(3,663)	.000
+ expectancies, values	.026	8.915	(4,659)	.000
2.1 + expectancies	.023	15.650	(2,661)	.000
+ values	.003	2.127	(2,659)	.120
2.2 + values	.012	7.979	(2,661)	.000
+ expectancies	.014	9.744	(2,659)	.000
2.3 + positive exp., values	.018	11.843	(2,661)	.000
+ negative exp., values	.008	5.815	(2,659)	.003
2.4 + negative exp., values	.009	5.724	(2,661)	.003
+ positive exp., values	.017	11.918	(2,659)	.003
US female				
1. exp., values, age, Mills	.299	52.286	(6,734)	.000
+ Q-FT1	.187	266.609	(1,733)	.000
2. age, Mills, Q-FT1	.464	212.952	(3,737)	.000
+ expectancies, values	.022	7.828	(4,733)	.000
2.1 + expectancies	.020	14.000	(2,735)	.000
+ values	.002	1.633	(2,733)	.196
2.2 + values	.008	5.763	(2,735)	.003
+ expectancies	.014	9.756	(2,733)	.000
2.3 + positive exp., values	.013	8.889	(2,735)	.000
+ negative exp., values	.009	6.631	(2,733)	.001
2.4 + negative exp., values	.011	7.448	(2,735)	.001
+ positive exp., values	.011	8.065	(2,733)	.000
Irish male				
1. exp., values, age, Mills	.300	43.520	(6,608)	.000
+ Q-FT1	.193	231.578	(1,607)	.000
2. age, Mills, Q-FT1	.471	181.621	(3,611)	.000
+ expectancies, values	.022	6.664	(4,607)	.000
2.1 + expectancies	.020	12.211	(2,609)	.000
+ values	.002	1.112	(2,607)	.329
2.2 + values	.007	4.118	(2,609)	.017
+ expectancies	.015	9.100	(2,607)	.000
2.3 + positive exp., values	.016	9.320	(2,609)	.000
+ negative exp., values	.007	3.918	(2,607)	.020
2.4 + negative exp., values	.007	4.218	(2,609)	.015
+ positive exp., values	.015	8.999	(2,607)	.000

Note: Shaded rows are the unique contributions of the variables.

Table A-4: (continued)

Procedure	R^2 change	F change	d.f.	Sig. of F change
Irish female				
1. exp., values, age, Mills	.308	52.441	(6,708)	.000
+ Q-FT1	.225	339.822	(1,707)	.000
2. age, Mills, Q-FT1	.518	254.804	(3,711)	.000
+ expectancies, values	.014	5.413	(4,707)	.000
2.1 + expectancies	.011	8.313	(2,709)	.000
+ values	.003	2.478	(2,707)	.085
2.2 + values	.006	4.247	(2,709)	.015
+ expectancies	.009	6.513	(2,707)	.002
2.3 + positive exp., values	.007	4.908	(2,709)	.008
+ negative exp., values	.008	5.851	(2,707)	.003
2.4 + negative exp., values	.007	5.137	(2,709)	.006
+ positive exp., values	.007	5.622	(2,707)	.004

Note: Shaded rows are the unique contributions of the variables.

Table A-5: Bivariate correlation for variables in alcohol expectancy and value model

US Male	POSE T1	NEGE T1	POSV T1	NEGV T1	Q-F T1	POSE T2	NEGE T2	POSV T2	NEGV T2	Q-F T2
POSET1	1.000									
NEGET1	-.124*	1.000								
POSVT1	.515*	-.229*	1.000							
NEGVT1	.080*	-.031	.013	1.000						
Q-FT1	.293*	-.537*	.353*	.185*	1.000					
POSET2	.563*	-.110*	.418*	.030	.196*	1.000				
NEGET2	-.214*	.662*	-.308*	-.005	-.452*	-.101*	1.000			
POSVT2	.361*	-.165*	.574*	-.025	.245*	.508*	-.206*	1.000		
NEGVT2	.040	-.011	-.022	.411*	.083*	.015	.053	-.076*	1.000	
Q-FT2	.320*	-.452*	.354*	.130*	.701*	.310*	-.488*	.334*	.126*	1.000

US Female	POSE T1	NEGE T1	POSV T1	NEGV T1	Q-F T1	POSE T2	NEGE T2	POSV T2	NEGV T2	Q-F T2
POSET1	1.000									
NEGET1	-.222*	1.000								
POSVT1	.585*	-.169*	1.000							
NEGVT1	.126*	-.030	.019	1.000						
Q-FT1	.456*	-.444*	.349*	.165*	1.000					
POSET2	.595*	-.193*	.500*	.039	.329*	1.000				
NEGET2	-.286*	.647*	-.172*	-.041	-.411*	-.224*	1.000			
POSVT2	.503*	-.142*	.662*	.025	.276*	.620*	-.131*	1.000		
NEGVT2	.010	.018	-.055	.434*	.034	.022	.013	-.016	1.000	
Q-FT2	.411*	-.383*	.326*	.140*	.679*	.444*	-.442*	.355*	.074*	1.000

POSE = positive expectancies; NEGE = negative expectancies; POSV = positive values; NEGV = negative values; Q-F = quantity-frequency drinking. * $p < .05$

Table A-5: (continued)

Irish Male	POSE T1	NEGE T1	POSV T1	NEGV T1	Q-F T1	POSE T2	NEGE T2	POSV T2	NEGV T2	Q-F T2
POSET1	1.000									
NEGET1	-.089*	1.000								
POSVT1	.403*	-.115*	1.000							
NEGVT1	.028	.051	.024	1.000						
Q-FT1	.165*	-.512*	.269*	.125*	1.000					
POSET2	.469*	-.014	.242*	.069	.046	1.000				
NEGET2	-.135*	.622*	-.170*	.091*	-.398*	-.025	1.000			
POSVT2	.303*	-.020	.634*	.062	.189*	.396*	-.068	1.000		
NEGVT2	.030	.088*	-.026	.340*	.042	.052	.148*	-.040	1.000	
Q-FT2	.225*	-.441*	.253*	.050	.680*	.144*	-.422*	.251*	.064	1.000

Irish Female	POSE T1	NEGE T1	POSV T1	NEGV T1	Q-F T1	POSE T2	NEGE T2	POSV T2	NEGV T2	Q-F T2
POSET1	1.000									
NEGET1	-.118*	1.000								
POSVT1	.588*	-.105*	1.000							
NEGVT1	.087*	.079*	.044	1.000						
Q-FT1	.339*	-.453*	.348*	.212*	1.000					
POSET2	.444*	-.037	.327*	.066	.159*	1.000				
NEGET2	-.172*	.599*	-.156*	.072	-.376*	-.058	1.000			
POSVT2	.420*	-.031	.561*	.070	.232*	.535*	-.077*	1.000		
NEGVT2	.077*	.093*	.053	.524*	.126*	.059	.153*	.029	1.000	
Q-FT2	.316*	-.415*	.303*	.161*	.709*	.243*	-.444*	.267*	.164*	1.000

Note: POSE = positive expectancies; NEGE = negative expectancies; POSV = positive values; NEGV = negative values; Q-F = quantity-frequency drinking. * $p < .05$

Table A-6: Alcohol expectancy and value model: Initial model and equality constraints

	Dependent Variable				
Predictor	POSET2	NEGET2	POSVT2	NEGVT2	Q-FT2
Controls					
Age	X	X	X	X	X
Mills	X	X	X	X	X
POSET1	X	X	X	X	X
NEGET1	X	X	X	X	X
POSVT1	X	X	X	X	X
NEGVT1	X	X	X	X	X
Q-FT1	X	X	X	X	X

Note: All but the shaded coefficients were tested for equivalence across groups.

all effects of the model variables were equal for the four groups. LM tests examined the reasonableness of each equality constraint. Model estimation continued till all of the unreasonable equality constraints ($p < .05$) were subsequently released from the model. The results of the multi-group comparison are summarized in Table A-7. The final model fit the data very well [χ^2 (80) = 73.19, p = .69, Bentler-Bonnet Normed Fit Index = .994 and Comparative Fit Index = 1.000].

Predicting Drinking

This model predicted later Q-F drinking well. The variance in Q-F drinking explained by the final model ranged from .49 to .53 for the four groups. Positive expectancies, negative expectancies and positive values significantly predicted changes in drinking in all four groups. Moreover, these cross-lagged effects were statistically equal for the four groups. Negative values did not significantly predict later drinking for any group. Therefore, adolescents increased their drinking more when positive alcohol effects were more likely and more desirable and negative alcohol effects were less likely.

The stability path coefficient for Q-FT1 and Q-FT2 showed that earlier drinking was highly related to later drinking. In fact, earlier drinking was the most important predictor of later drinking. LM tests indicated that the stability in Q-F drinking was equal for the four groups. Moreover, Q-F drinking increased more with age for Irish boys and Irish girls. This age effect was equal in magnitude for the two Irish groups. However, direct age effect was not significant for American adolescents, after all other effects were taken into account. Therefore, older Irish adolescents increased drinking more than the younger ones, regardless of their expectancy-value beliefs. Such age differences in the American sample were not significant once differences in alcohol expectancies and values were taken into account.

Table A-7: Alcohol expectancy and value model: Results of cross-group comparisons

US male	Dependent Variables				
Predictors	POSET2	NEGET2	POSVT2	NEGVT2	Q-FT2
Age	-.061*	-.045*	-.108*	-.036*	-.039
Mills	.043	-.010	-.040	-.030	-.022
POSET1	.469*	-.073*	.080*	.011	.083*
NEGET1	-.033	.569*	-.004	.026	-.102*
POSVT1	.173*	-.042*	.512*	-.049*	.045*
NEGVT1	.006	.037*	-.003	.391*	.026
Q-FT1	-.023	-.108*	.067*	.023	.612*
R^2	.341	.455	.348	.157	.507

US female	Dependent Variables				
Predictors	POSET2	NEGET2	POSVT2	NEGVT2	Q-FT2
Age	-.058*	-.046*	-.105*	-.050*	-.042
Mills	-.042	.050	-.091*	.068	-.010
POSET1	.475*	-.079*	.182*	.016	.095*
NEGET1	-.031	.563*	-.004	.035	-.107*
POSVT1	.173*	-.045*	.525*	-.072*	.051*
NEGVT1	.004	.028*	-.002	.415*	.021
Q-FT1	.060*	-.096*	.057*	.028	.578*
R^2	.401	.435	.469	.195	.489

Note: 1. POSE = positive expectancies; NEGE = negative expectancies; POSV = positive values; NEGV = negative values; Q-F = quantity-frequency drinking.

2. Numbers in the cells are standardized regression coefficients (β). Please refer to Table A-7 in Appendix C for the non-standardized coefficient (b) and standard error for each coefficient.

3. Underlined coefficients are statistically not equal for the four groups.

4. * $p < .05$

Table A-7: (contiuned)

Irish male	Dependent Variables				
Predictors	POSET2	NEGET2	POSVT2	NEGVT2	Q-FT2
Age	-.070*	-.057*	-.141*	-.049*	.068*
Mills	.014	.109	.011	.029	.036
POSET1	.439*	-.075*	.086*	.012	.083*
NEGET1	-.028	.532*	-.004	.026	-.094*
POSVT1	.067	-.040*	.577*	-.049*	.041*
NEGVT1	.005	.032*	-.003	.367*	.022
Q-FT1	-.021	-.105*	.068*	.024	.584*
R^2	.227	.457	.422	.152	.491

Irish female	Dependent Variables				
Predictors	POSET2	NEGET2	POSVT2	NEGVT2	Q-FT2
Age	-.065*	-.187*	-.117*	-.044*	.065*
Mills	-.032	.027	-.047	.025	-.063*
POSET1	.344*	-.079*	.083*	.013	.093*
NEGET1	-.030	.436*	-.004	.026	-.101*
POSVT1	.169*	-.044*	.509*	.023	.048*
NEGVT1	.005	.030*	-.002	.498*	.022
Q-FT1	-.020	-.100*	.059*	.023	.591*
R^2	.205	.418	.331	.276	.534

Note: 1. POSE = positive expectancies; NEGE = negative expectancies; POSV = positive values; NEGV = negative values; Q-F = quantity-frequency drinking.

2. Numbers in the cells are standardized regression coefficients (β). Please refer to Table A-7 in Appendix C for the non-standardized coefficient (b) and standard error for each coefficient.
3. Underlined coefficients are statistically not equal for the four groups.
4. * $p < .05$

That is, age differences in changes in drinking in the American sample appeared to be mediated through alcohol expectancies and values.

Predicting Alcohol Expectancies and Values

Alcohol expectancies and values were also relatively stable over time. For American boys and girls and Irish boys, perceived likelihood of negative alcohol effects (i.e., negative expectancies) and desirability of positive alcohol effects (i.e., positive values) were more stable than perceived likelihood of positive alcohol effects (i.e., positive expectancies) and desirability of negative alcohol effects (i.e., negative values). Whereas Irish girls' desirability of positive and negative alcohol effects were more stable than perceived likelihood of positive and negative alcohol effects.

LM tests indicated that the four expectancy and value factors were not all equally stable for the four groups. The two American groups and Irish boys were equally stable on their positive and negative expectancies, whereas Irish girls were least stable among the four groups on these two factors. However, Irish girls were most stable among the four groups on negative values, while the other three groups were equivalent and less. Irish boys were most stable on their positive values among the four groups, while the other three groups were equally less stable. In summary, the two American groups were equal in the stability of the four alcohol expectancy and value factors. In contrast, Irish boys were more stable on positive values, whereas Irish girls were more stable on negative values and less stable on both positive and negative expectancies.

In addition to the stability, some cross-lagged effects are noteworthy. First, changes in positive expectancies were significantly predicted by positive values for the two American groups and for Irish girls, but not for Irish boys. This path coefficient was equal for the two

American groups and Irish girls. Therefore, for American adolescents and Irish girls, when the positive alcohol effects were more favorable, increases in the likelihood of positive alcohol effects were greater. Second, positive expectancies, positive values and negative values significantly predicted changes in negative expectancies over time for all four groups. Therefore, when positive alcohol effects were more likely and more desirable and negative alcohol effects were less undesirable, decreases in negative expectancies were greater. These three cross-lagged effects were statistically equal for the four groups. Third, the cross-lagged effect from positive expectancies to positive values was significant for the four groups. Thus, when positive alcohol effects were more likely, the desirability of positive alcohol effects increased by a greater magnitude. This effect was greater for American girls than for the other three groups, which were equal. Changes in negative values were also significantly and equally predicted by positive values for the two American groups and for Irish boys, but not for Irish girls. Therefore, for all adolescents except Irish girls, when positive alcohol effects were more desirable, the desirability of negative alcohol effects decreased by a greater magnitude. However, this relationship was not found for Irish girls.

The results also provided some evidence for reciprocal effects of drinking on alcohol expectancies and values. Earlier Q-F drinking significantly and equally predicted changes in negative expectancies and positive values for the four groups. Higher prior drinking was related to a greater decreased in negative expectancies one year later. Whereas increases in the desirability of positive alcohol effects were greater when earlier Q-F drinking was higher. The cross-lagged effects from earlier Q-F drinking to later positive expectancies and negative values were not significantly for any group, except that positive expectancies increased with drinking for American girls. This finding partially supports what has been found in the

literature in which positive expectancies increase with drinking experience (Sher, et al., 1996; Smith et al., 1995). Earlier drinking, in the present study, affected alcohol expectancies and values primarily in that negative alcohol effects were perceived as less likely and the positive alcohol effects were perceived as more desirable.

Consistent with the literature, age was negatively associated with changes in alcohol expectancies and values. First, changes in perceived likelihood of both positive and negative alcohol effects decreased with age for the four groups. That is, increases in the perceived likelihood of positive and negative expectancies were greater for younger adolescents than for older adolescents. This age effect on changes in positive expectancies was equal across the four groups. However, the age effect on changes in negative expectancies was greater for Irish girls than for the other three groups, which were equal. That is, decreases in negative expectancies were greater for younger Irish girls. Second, changes in perceived desirability of both positive and negative alcohol effects also decreased with age. Thus, greater increases in alcohol values were also observed among younger adolescents than among older adolescents. These two age effects were statistically equal for the four groups.

B. Social Learning Model

The social learning model tested the relationships between anticipation of alcohol effects (i.e., alcohol expectancies and values), social influence (i.e., subjective norms and perceived behavior modeling) and drinking. Q-F drinking, alcohol expectancies and values, subjective norms (perceived parents' or friends' disapproval of drinking by the respondent), modeling (perceived drinking by parents and friends), age, and the inverse Mills ratio were included in the model.

Subjective norms. Subjective norms refer to the perceived disapproval of drinking by persons that the respondent is socially associated with. The respondent was asked to rate on a 5-point scale the level of perceived disapproval of the respondent's drinking (disapprove very strongly - would not disapprove) by mother, father, best friend, other good friends and same-age peers. Perceived disapproval by the general same-age peers was not included in the analyses because previous studies suggested that the influence from distal same-age peers on adolescent substance use is minimal (Kaplan, 1996; Morgan & Grube, 1991).

An index of perceived parental disapproval was computed by taking the mean of perceived father's and mother's disapproval. If the score for one parent was missing, the score for the other parent was used to represent a general parental disapproval. Similarly, an index of perceived friends' disapproval was computed by taking the mean of the two friend items. If the score for one item was missing, the score for the other item was used to represent a general friends' disapproval. The respondent was allowed to answer "no such person" on these measures. If "no such person" was checked for any of them, it is treated as if such person would not disapprove.

About 93% of the American sample reported that mother would disapprove their

drinking. The differences between boys and girls were not significant. However, slightly more of American girls (93%) than boys (90%) reported that father would disapprove their drinking [χ (1) = 7.19, $p < .01$]. For the Irish sample, more of Irish girls (89%) than Irish boys (81%) reported that mother would disapprove their drinking [χ (1) = 24.79, $p < .001$]. Moreover, more of Irish girls (89%) than Irish boys (77%) reported that father would disapprove their drinking [χ (1) = 53.52, $p < .001$].

As regards friends' disapproval, American girls (54%) were more likely than boys (40%) to reported that best friend would disapprove their drinking [χ (1) = 33.17, $p < .001$] and that other good friends would disapprove their drinking [48% vs. 37%, χ (1) = 24.57, $p < .001$]. Similar gender differences in perceived friends' disapproval were found in the Irish sample. Irish girls (33%) were more likely than boys (20%) to reported that best friend would disapprove their drinking [χ (1) = 39.13, $p < .001$] and that other good friends would disapprove their drinking [29% vs. 17%, χ (1) = 44.10, $p < .001$].

Subjective norms were further examined for the four groups using 2 (sample) by 2 (gender) analyses of covariance, adjusting for age. Table B-1 summarizes the results of the analyses and the age-adjusted means for the variables. Overall, American adolescents perceived stronger disapproval of their drinking by parents, best friend, and other good friends than did Irish adolescents. Girls perceived stronger disapproval of drinking by their parents, best friend and other good friends than did boys. The gender difference in the perceived parents' disapproval was stronger in the Irish sample. However, the gender difference in the perceived friends' disapproval was similar for the two samples. The perceived social disapproval from all sources decreased with age. In other words, younger adolescents than older ones perceived stronger social disapproval of their drinking.

Table B-1: Analyses of covariance and age-adjusted means for subjective norms and modeling

Item and effect	F	d.f.	p	Age-adjusted Mean
	Subjective Norms			
1. Disapproval by parents				
Sample	258.37	1,3911	.000	US boys=3.66
Gender	51.11	1,3911	.000	US girls=3.78
Age (β = -.42)	703.37	1,3911	.000	Irish boys=2.82
Sample x gender	16.67	1,3911	.000	Irish girls=3.26
2. Disapproval by best friend				
Sample	296.06	1,3911	.000	US boys=1.89
Gender	55.75	1,3911	.000	US gilrs=2.19
Age (β = -.16)	98.79	1,3911	.000	Irish boys=1.24
Sample x gender	.52	1,3911	.473	Irish girls=1.49
3. Disapproval by other good friends				
Sample	262.71	1,3911	.000	US boys=1.74
Gender	46.24	1,3911	.000	US girls=1.97
Age (β = -.18)	113.52	1,3911	.000	Irish boys=1.20
Sample x gender	.19	1,3911	.664	Irish girls=1.40
	Modeling			
1. Drinking by parents				
Sample	57.47	1,3898	.000	US boys=16.6
Gender	2.42	1,3898	.120	US girls=16.3
Age	.16	1,3898	.691	Irish boys=27.9
Sample x gender	1.61	1,3898	.204	Irish girls=23.8
2. Drinking by best friend				
Sample	386.62	1,3898	.000	US boys=5.7
Gender	50.74	1,3898	.000	US girls=4.0
Age (β = .37)	547.90	1,3898	.000	Irish boys=16.8
Sample x gender	.07	1,3898	.798	Irish girls=16.9
3. Drinking by good friends				
Sample	286.92	1,3898	.000	US boys=9.4
Gender	30.49	1,3898	.000	US girls=6.9
Age (β = .42)	701.34	1,3898	.000	Irish boys=20.8
Sample x gender	1.08	1,3898	.298	Irish girls=16.9

Modeling. Modeling refers to the drinking practice of persons that the respondent is socially associated with. However, the US-Irish project did not ask the respondent's parents or friends to report their own drinking. Instead, the respondent was asked to report how often these persons drank. Because the present study is interested in how a person's beliefs affect his or her behavior, the respondent's perceived drinking by parents and friends were considered more relevant than parents' and friends' actual drinking.

The respondent was asked how often each of these persons (father, mother, best friend, other good friends) had at least one whole drink of any alcoholic beverage in the past 12 months on a 9-point scale (not at all -- every day). Measures of behavioral modeling were first re-coded into number of days and then log transformed prior to analyses because the data were highly skewed. Corresponding to subjective norms, two variables were computed to represent different types of modeling, i.e., perceived drinking by parents and by friends. Similarly, if "no such person" was checked, it was treated as if that person did not drink at all. If one of the two items was missing or "no such person" was checked, the score for the other item was used to represent the entire score for that type of modeling for the respondent.

As is shown in Table B-1, differences in the perceived drinking by parents were significant between the two samples. That is, Irish adolescents reported that their parents drank more often than did American adolescents. However, no significant gender difference was found within each sample. Moreover, adolescents of all ages were similar in reporting parents' drinking. However, perceived drinking by friends varied with sample, gender and age. Overall, Irish adolescents reported friends drinking more frequently than American adolescents did; boys reported friends drinking more frequently than girls did; and older adolescents reported friends drinking more frequently than younger adolescents did.

Table B-2: Commonality analyses for variables in social learning model

	R^2 change	F change	d.f.	Sig. of F change
US male				
age, Mills, Q-FT1	.492	214.379	(3,663)	.000
+ norms, modeling	.036	12.758	(4,659)	.000
+ exp., values	.011	3.909	(4,655)	.000
+ exp., values	.026	8.915	(4,659)	.000
+ norms, modeling	.021	7.619	(4,655)	.000
+ norms	.009	6.056	(2,657)	.002
+ modeling	.013	9.035	(2,655)	.000
+ modeling	.018	12.922	(2,657)	.000
+ norms	.003	2.267	(2,655)	.104
+ parents	.004	2.616	(2,657)	.074
+ friends	.018	12.531	(2,655)	.000
+ friends	.020	14.225	(2,657)	.000
+ parents	.001	1.013	(2,655)	.364
US female				
age, Mills, Q-FT1	.464	212.952	(3,737)	.000
+ norms, modeling	.021	7.499	(4,733)	.000
+ exp., values	.013	4.655	(4,729)	.001
+ exp., values	.022	7.828	(4,733)	.000
+ norms, modeling	.012	4.333	(4,729)	.002
+ norms	.004	2.602	(2,731)	.075
+ modeling	.008	6.028	(2,729)	.003
+ modeling	.011	7.760	(2,731)	.000
+ norms	.001	.908	(2,729)	.404
+ parents	.005	3.291	(2,731)	.038
+ friends	.007	5.336	(2,729)	.005
+ friends	.009	6.360	(2,731)	.002
+ parents	.003	2.284	(2,729)	.103
Irish male				
Age, Mills, Q-FT1	.471	181.621	(3,611)	.000
+ norms, modeling	.010	2.990	(4,607)	.018
+ exp., values	.015	4.536	(4,603)	.001
+ exp., values	.022	6.664	(4,607)	.000
+ norms, modeling	.003	.935	(4,603)	.443
+ norms	.002	1.308	(2,605)	.271
+ modeling	.001	.563	(2,603)	.302
+ modeling	.001	.670	(2,605)	.512
+ norms	.002	1.198	(2,603)	.302
+ parents	.001	.773	(2,605)	.462
+ friends	.002	1.096	(2,603)	.335
+ friends	.002	1.202	(2,605)	.301
+ parents	.001	.668	(2,603)	.513

Note: Shaded rows are unique contributions of the variables.

Table B-2: (continued)

	R^2 change	F change	d.f.	Sig. of F change
Irish female				
Age, Mills, Q-FT1	.518	254.804	(3,711)	.000
+ norms, modeling	.008	3.070	(4,707)	.016
+ exp., values	.009	3.378	(4,703)	.009
+ exp., values	.014	5.413	(4,707)	.000
+ norms, modeling	.003	1.073	(4,703)	.369
+ norms	.002	1.546	(2,705)	.214
+ modeling	.001	.603	(2,703)	.548
+ modeling	.000	.349	(2,705)	.705
+ norms	.002	1.797	(2,703)	.167
+ parents	.001	.773	(2,705)	.462
+ friends	.002	1.374	(2,703)	.254
+ friends	.001	1.084	(2,705)	.339
+ parents	.001	1.062	(2,703)	.346

The unique contribution of modeling and subjective norms in predicting changes in Q-F drinking was examined using commonality analyses. Table B-2 summarizes the results of the commonality analyses. The results indicated that (1) for American boys, the unique contribution of social influence was greater than expectancies and values, whereas expectancies/values and social influence were about equally important for American girls; (2) for both Irish boys and girls, expectancies and values were more important than was social influence; (3) the unique contribution of social influence was not significant for the Irish sample; (4) the unique contribution of behavior modeling was greater than the unique contribution of normative beliefs for both American boys and girls; and (5) friends' influence was greater than parents' influence for American adolescents.

The next step examined the relationships between the variables in the social learning model. Table B-3 presents the bivariate correlation between the variables. The relationships were all in the expected directions. Drinking was positively related to parents' drinking and friends' drinking but was negatively associated with perceived parents' and friends'

Table B-3: Bivariate correlation for variables in social learning model

US Male	POSE T1	NEGE T1	POSV T1	NEGV T1	SNP T1	SNF T1	DRKP T1	DRKF T1	Q-F T1	POSE T2	NEGE T2	POSV T2	NEGV T2	SNP T2	SNF T2	DRKP T2	DRKF T2	Q-F T2
POSET1	1.000																	
NEGET1	-.124*	1.000																
POSVT1	.515*	-.229*	1.000															
NEGVT1	.080*	-.031	.013	1.000														
SNPT1	-.116*	.393*	-.163*	-.112*	1.000													
SNFT1	-.329*	.497*	-.341*	-.112*	.422*	1.000												
DRKPT1	.125*	-.168*	.100*	.012	-.285*	-.231*	1.000											
DRKFT1	.274*	-.466*	.306*	.135*	-.352*	-.531*	.219*	1.000										
Q-FT1	.293*	-.537*	.353*	.185*	-.345*	-.454*	.236*	.668*	1.000									
POSET2	.563*	-.110*	.418*	.030	-.119*	-.250*	.082*	.171*	.196*	1.000								
NEGET2	-.214*	.662*	-.308*	-.005	.371*	.476*	-.233*	-.401*	-.452*	-.101*	1.000							
POSVT2	.361*	-.165*	.574*	-.025	-.120*	-.315*	.099*	.200*	.245*	.508*	-.206*	1.000						
NEGVT2	.040	-.011	-.022	.411*	-.049	-.036	-.045	.010	.083*	.015	.053	-.076*	1.000					
SNPT2	-.157*	.370*	-.168*	-.082*	.679*	.368*	-.264*	-.327*	-.336*	-.091*	.439*	-.141*	-.091*	1.000				
SNFT2	-.318*	.372*	-.317*	-.094*	.303*	.656*	-.177*	-.399*	-.361*	-.303*	.451*	-.356*	-.126*	.383*	1.000			
DRKPT2	.104*	-.188*	.114*	-.020	-.292*	-.208*	.843*	.224*	.220*	.070	-.249*	.113*	-.073	-.284*	-.187*	1.000		
DRKFT2	.282*	-.393*	.315*	.028	-.295*	-.441*	.251*	.657*	.501*	.233*	-.446*	.288*	.090*	-.359*	-.537*	.307*	1.000	
Q-FT2	.320*	-.452*	.354*	.130*	-.317*	-.447*	.210*	.580*	.701*	.310*	-.488*	.334*	.126*	-.342*	-.468*	.225*	.623*	1.000
US Female	POSE T1	NEGE T1	POSV T1	NEGV T1	SNP T1	SNF T1	DRKP T1	DRKF T1	Q-F T1	POSE T2	NEGE T2	POSV T2	NEGV T2	SNP T2	SNF T2	DRKP T2	DRKF T2	Q-F T2
POSET1	1.000																	
NEGET1	-.222*	1.000																
POSVT1	.585*	-.169*	1.000															
NEGVT1	.126*	-.030	.019	1.000														
SNPT1	-.211*	.331*	-.140*	-.095*	1.000													
SNFT1	-.458*	.435*	-.353*	-.106*	.415*	1.000												
DRKPT1	.162*	-.118*	.169*	.070	-.289*	-.261*	1.000											
DRKFT1	.353*	-.358*	.249*	.063	-.327*	-.550*	.258*	1.000										
Q-FT1	.456*	-.444*	.349*	.165*	-.338*	-.492*	.242*	.612*	1.000									
POSET2	.595*	-.193*	.500*	.039	-.161*	-.400*	.116*	.288*	.329*	1.000								
NEGET2	-.286*	.647*	-.172*	-.041	.277*	.385*	-.137*	-.395*	-.411*	-.224*	1.000							
POSVT2	.503*	-.142*	.662*	.025	-.124*	-.323*	.138*	.208*	.276*	.620*	-.131*	1.000						
NEGVT2	.010	.018	-.055	.434*	-.003	-.008	.022	-.008	.034	.022	.013	-.016	1.000					
SNPT2	-.203*	.264*	-.154*	-.106*	.675*	.361*	-.299*	-.330*	-.319*	-.179*	.297*	-.131*	-.029	1.000				
SNFT2	-.355*	.352*	-.283*	-.032	.323*	.663*	-.222*	-.479*	-.369*	-.430*	.438*	-.331*	-.025	.426*	1.000			
DRKPT2	.178*	-.114*	.175*	.048	-.266*	-.262*	.835*	.230*	.221*	.155*	-.145*	.168*	.004	-.313*	-.249*	1.000		
DRKFT2	.367*	-.306*	.264*	.054	-.294*	-.508*	.245*	.626*	.520*	.347*	-.357*	.285*	.039	-.319*	-.580*	.282*	1.000	
Q-FT2	.411*	-.383*	.326*	.140*	-.256*	-.435*	.242*	.495*	.679*	.444*	-.442*	.355*	.074*	-.282*	-.456*	.290*	.599*	1.000

* $p < .05$; POSE=positive expectancies; NEGE=negative expectancies; POSV=positive values; NEGV=negative values; Q-F=quantity-frequency drinking; SNP=perceived parents' disapproval; SNF=perceived friends' disapproval; DRKP=perceived drinking by parents; DRKF=percevied drinking by friends

Table B-3: (continued)

Irish Male	POSE T1	NEGE T1	POSV T1	NEGV T1	SNP T1	SNF T1	DRKP T1	DRKF T1	Q-F T1	POSE T2	NEGE T2	POSV T2	NEGV T2	SNP T2	SNF T2	DRKP T2	DRKF T2	Q-F T2
POSET1	1.000																	
NEGET1	-.089*	1.000																
POSVT1	.403*	-.115*	1.000															
NEGVT1	.028	.051	.024	1.000														
SNPT1	-.038	.495*	-.120*	.011	1.000													
SNFT1	-.256*	.370*	-.308*	-.024	.308*	1.000												
DRKPT1	.066	-.155*	.157*	-.023	-.209*	-.133*	1.000											
DRKFT1	.177*	-.450*	.207*	.044	-.484*	-.420*	.191*	1.000										
Q-FT1	.165*	-.512*	.269*	.125*	-.418*	-.353*	.178*	.567*	1.000									
POSET2	.469*	-.014	.242*	.069	.006	-.179*	.066	.044	.046	1.000								
NEGET2	-.135*	.622*	-.170*	.091*	.362*	.346*	-.121*	-.437*	-.398*	-.025	1.000							
POSVT2	.303*	-.020	.634*	.062	-.041	-.289*	.088*	.149*	.189*	.396*	-.068	1.000						
NEGVT2	.030	.088*	-.026	.340*	.018	.008	.025	.029	.042	.052	.148*	-.040	1.000					
SNPT2	-.090*	.454*	-.129*	.060	.679*	.291*	-.247*	-.435*	-.382*	-.044	.460*	-.102*	.107*	1.000				
SNFT2	-.217*	.283*	-.268*	-.049	.225*	.479*	-.108*	-.299*	-.260*	-.263*	.360*	-.327*	.033	.336*	1.000			
DRKPT2	.031	-.162*	.117*	.036	-.210*	-.091*	.756*	.134*	.157*	.058	-.130*	.052	.064	-.262*	-.090*	1.000		
DRKFT2	.140*	-.430*	.228*	.005	-.450*	-.386*	.191*	.632*	.505*	.083*	-.451*	.163*	-.010	-.458*	-.387*	.240*	1.000	
Q-FT2	.225*	-.441*	.253*	.050	-.351*	-.334*	.169*	.442*	.680*	.144*	-.422*	.251*	.064	-.365*	-.315*	.190*	.555*	1.000
Irish Female	POSE T1	NEGE T1	POSV T1	NEGV T1	SNP T1	SNF T1	DRKP T1	DRKF T1	Q-F T1	POSE T2	NEGE T2	POSV T2	NEGV T2	SNP T2	SNF T2	DRKP T2	DRKF T2	Q-F T2
POSET1	1.000																	
NEGET1	-.118*	1.000																
POSVT1	.588*	-.105*	1.000															
NEGVT1	.087*	.079*	.044	1.000														
SNPT1	-.107*	.420*	-.115*	-.044	1.000													
SNFT1	-.356*	.440*	-.389*	-.133*	.378*	1.000												
DRKPT1	.106*	-.094*	.091*	.080*	-.200*	-.073	1.000											
DRKFT1	.303*	-.423*	.283*	.100*	-.390*	-.524*	.135*	1.000										
Q-FT1	.339*	-.453*	.348*	.212*	-.379*	-.452*	.192*	.596*	1.000									
POSET2	.444*	-.037	.327*	.066	.026	-.122*	.032	.056	.159*	1.000								
NEGET2	-.172*	.599*	-.156*	.072	.322*	.390*	-.078*	-.384*	-.376*	-.058	1.000							
POSVT2	.420*	-.031	.561*	.070	-.002	-.232*	.053	.088*	.232*	.535*	-.077*	1.000						
NEGVT2	.077*	.093*	.053	.524*	-.023	-.015	.069	.035	.126*	.059	.153*	.029	1.000					
SNPT2	-.100*	.430*	-.111*	-.007	.659*	.404*	-.213*	-.450*	-.375*	.026	.438*	-.035	.019	1.000				
SNFT2	-.251*	.313*	-.303*	-.042	.188*	.518*	-.089*	-.312*	-.333*	-.249*	.364*	-.372*	-.011	.347*	1.000			
DRKPT2	.082*	-.073	.079*	.064	-.192*	-.081*	.781*	.123*	.158*	.036	-.069	.065	.057	-.211*	-.091*	1.000		
DRKFT2	.231*	-.419*	.249*	.048	-.290*	-.472*	.079*	.645*	.483*	.147*	-.423*	.169*	.014	-.438*	-.476*	.136*	1.000	
Q-FT2	.316*	-.415*	.303*	.161*	-.307*	-.416*	.151*	.473*	.709*	.243*	-.444*	.267*	.164*	-.393*	-.425*	.177*	.540*	1.000

* $p < .05$; POSE=positive expectancies; NEGE=negative expectancies; POSV=positive values; NEGV=negative values; Q-F=quantity-frequency drinking; SNP=perceived parents' disapproval; SNF=perceived friends' disapproval; DRKP=perceived drinking by parents; DRKF=percevied drinking by friends

disapproval. The cross-sectional and longitudinal correlation coefficients both showed that the respondent's drinking was highly associated with perceived friends' drinking and moderately associated with other social influence. Perceived friends' disapproval and perceived friends' drinking were also highly correlated, but the association between perceived parents' disapproval and perceived parents' drinking was relatively small.

The relationships in this model and equivalence of these relationships across the four groups were further investigated using simultaneous structural equation analyses. Table B-4 presents the initial model and the results of cross-group comparisons are summarized in Table B-5. The final model fit the data well, [χ^2 (244) = 266.57, p = .15, Bentler-Bonnet Normed Fit Index = .990 and Comparative Fit Index = .999].

Table B-4: Social learning model: Initial model and equality constraints

Predictor	Dependent Variable								
	POSE T2	NEGE T2	POSV T2	NEGV T2	SNP T2	SNF T2	DRKP T2	DRKF T2	Q-F T2
Control									
AGE	x	x	x	x	x	x	x	x	x
MILLS	x	x	x	x	x	x	x	x	x
POSET1	x	x	x	x	x	x	x	x	x
NEGET1	x	x	x	x	x	x	x	x	x
POSVT1	x	x	x	x	x	x	x	x	x
NEGVT1	x	x	x	x	x	x	x	x	x
Norms									
SNPT1	x	x	x	x	x	x	x	x	x
SNFT1	x	x	x	x	x	x	x	x	x
Modeling									
DRKPT1	x	x	x	x	x	x	x	x	x
DRKFT1	x	x	x	x	x	x	x	x	x
Q-FT1	x	x	x	x	x	x	x	x	x

Note: 1. POSE = positive expectancies; NEGE = negative expectancies; POSV = positive values; NEGV = negative values; SNP = parents' disapproval; SNF = friend's disapproval; DRKP = parents' drinking; DRKF = friends' drinking; Q-F = quantity-frequency drinking.
2. All but the shaded structural coefficients were tested for equivalence across the four groups.

Table B-5: Social learning model: results of cross-group comparisons

US male	Dependent Variables								
Predictor	POSET2	NEGET2	POSVT2	NEGVT2	SNPT2	SNFT2	DRKPT2	DRKFT2	Q-FT2
Age	-.054*	-.064*	-.109*	-.036	-.138*	.022	-.028*	.033	-.044*
Mills	.037	-.028	-.041	-.029	-.010	.038	-.026	-.048	-.017
POSET1	.436*	-.054*	.035	.012	-.039*	-.033*	-.016	-.000	.065*
NEGET1	-.016	.514*	.021	.026	.035*	.057*	-.015	-.023	-.082*
POSVT1	.153*	-.033	.501*	-.044*	-.006	-.056*	.011	.041*	.034*
NEGVT1	.005	.044*	-.007	.392*	.005	-.026	-.021	-.018	.024
SNPT1	-.001	.025	.003	-.018	.555*	.001	-.041*	.004	.003
SNFT1	-.105*	.082*	-.104*	.019	.034	.559*	-.005	-.121*	-.051*
DRKPT1	-.012	-.032*	-.002	-.002	-.109*	-.020	.823*	.053*	.034*
DRKFT1	-.066*	-.048*	-.026	-.000	-.003	-.034	.008	.442*	.072*
Q-FT1	.005	-.060*	.057*	.024	-.054*	-.018	-.002	.125*	.562*
R^2	.322	.467	.333	.158	.496	.432	.703	.435	.527

US female	Dependent Variables								
Predictor	POSET2	NEGET2	POSVT2	NEGVT2	SNPT2	SNFT2	DRKPT2	DRKFT2	Q-FT2
Age	-.052*	-.064*	-.105*	-.050	-.136*	.018	-.027*	.035	-.047*
Mills	-.032	.037	-.092*	.071*	.035	.041	-.002	-.019	-.012
POSET1	.442*	-.058*	.157*	.018	-.041*	-.030*	.030	.072*	.074*
NEGET1	-.015	.506*	.020	.035	.034*	.046*	-.014	-.024	-.085*
POSVT1	.152*	-.035	.505*	-.065*	-.006	-.049*	.011	.047*	.039*
NEGVT1	.004	.034*	-.005	.416*	.004	.029*	-.015	-.015	.019
SNPT1	-.001	.025	.003	-.026	.554*	.001	-.040*	.005	.004
SNFT1	-.117*	.097*	-.116*	.031	.039	.549*	-.006	-.154*	-.064*
DRKPT1	-.011	-.033*	-.002	-.002	-.109*	-.017	.808*	.058*	.036*
DRKFT1	.042	-.041*	-.021	-.000	-.002	-.122*	.007	.403*	.065*
Q-FT1	.004	-.053*	.048*	.029	-.047*	-.013	-.002	.119*	.530*
R^2	.401	.442	.468	.196	.488	.473	.694	.456	.506

Note: 1. POSE = positive expectancies; NEGE = negative expectancies; POSV = positive values; NEGV = negative values; SNP = parents' disapproval; SNF = friend's disapproval; DRKP = parents' drinking; DRKF = friends' drinking; Q-F = quantity-frequency drinking.

2. Numbers in the cells are standardized regression coefficients (β). Please refer to Table B-5 in Appendix C for the non-standardized coefficient (b) and standard error for each coefficient.
3. Underlined coefficients were not equal across the four groups.
4. * $p < .05$

Table B-5: (continued)

Irish male	Dependent Variables								
Predictor	POSET2	NEGET2	POSVT2	NEGVT2	SNPT2	SNFT2	DRKPT2	DRKFT2	Q-FT2
Age	-.061*	-.082*	-.140*	-.048	-.173*	.059	-.046*	.252*	.047
Mills	.006	.110*	.020	.035	.108*	.078*	-.012	-.019	.037
POSET1	.401*	-.056*	.037	.013	-.040*	-.074*	-.021	-.000	.066*
NEGET1	-.013	.489*	.020	.026	.032*	.113*	-.018	-.026	-.076*
POSVT1	.128*	-.031	.585*	-.045*	-.005	-.112*	.013	.048*	.032*
NEGVT1	.004	.039*	-.006	.368*	.005	-.049	.054*	-.019	.021
SNPT1	-.001	-.085*	.004	-.021	.481*	.002	-.058*	.006	.004
SNFT1	-.054*	.048*	-.061*	.012	.019	.329*	-.004	-.087*	-.030*
DRKPT1	-.008	-.025*	-.002	-.001	-.084*	-.033	.741*	.051*	.026*
DRKFT1	-.052*	-.125*	.055	-.000	-.002	-.063	.009	.355*	.063*
Q-FT1	.004	-.059*	.057*	.025	-.052*	-.037	-.003	.152*	.546*
R^2	.235	.453	.436	.152	.537	.265	.574	.506	.479

Irish female	Dependent Variables								
Predictor	POSET2	NEGET2	POSVT2	NEGVT2	SNPT2	SNFT2	DRKPT2	DRKFT2	Q-FT2
Age	-.056*	-.071*	-.114*	-.043	-.151*	.032	-.037*	.204*	.045
Mills	-.043	.051	-.051	.028	.068*	.051	-.002	-.088*	-.066*
POSET1	.431*	-.057*	.153*	.014	.064*	-.048*	-.020	-.000	.074*
NEGET1	-.014	.479*	.018	.026	.032*	.071*	-.016	-.024	-.081*
POSVT1	.144*	-.033	.479*	.024	-.006	-.077*	.013	.048*	.037*
NEGVT1	.004	.036*	-.005	.499*	.004	.050*	-.020	-.016	.020
SNPT1	-.001	.026	.003	-.021	.448*	.001	-.051*	.099*	.004
SNFT1	.043	.069*	-.081*	.018	.102*	.431*	-.005	-.117*	-.046*
DRKPT1	-.009	-.026*	-.002	-.002	-.085*	-.021	.786*	.048*	.028*
DRKFT1	-.052*	-.040*	-.089*	-.000	-.115*	-.038	.008	.426*	.064*
Q-FT1	.004	-.055*	.049*	.024	-.048*	-.022	-.003	.131*	.548*
R^2	.248	.431	.364	.276	.526	.301	.637	.520	.530

Note: 1. POSE = positive expectancies; NEGE = negative expectancies; POSV = positive values; NEGV = negative values; SNP = parents' disapproval; SNF = friend's disapproval; DRKP = parents' drinking; DRKF = friends' drinking; Q-F = quantity-frequency drinking.

2. Numbers in the cells are standardized regression coefficients (β). Please refer to Table B-5 in Appendix C for the non-standardized coefficient (b) and standard error for each coefficient.
3. Underlined coefficients were not equal across the four groups.
4. * $p < .05$

The R^2s indicated that adding the social influence variables into the model improved the fit of model over the alcohol expectancy and value model for the American sample, but not for the Irish sample. This result is consistent with findings from commonality analysis, in which the unique contribution of social influence was not significant for the Irish sample.

Predicting Drinking

Positive expectancies (POSET1), negative expectancies (NEGET1), and positive values (POSVT1) were significant, while negative values (NEGVT1) remained not significant, in predicting changes in drinking. The two modeling variables (DRKPT1 and DRKFT1) and friends' norm (SNFT1) significantly predicted changes in drinking for the four groups. Perceived parents' disapproval (SNPT1) was not significant in predicting changes in drinking for any group after taking into account age, expectancies, values and other social influence. The cross-lagged effects from social influence variables and from expectancies/values to drinking were statistically equal for the four groups. It is interesting to note that the unique contribution of social influence was not significant for the Irish sample, however, LM tests indicated that the cross-lagged effects from SNFT1, DRKPT1 and DRKFT1 to Q-FT2 were statistically equal for the four groups. Therefore, these effects were significant for the Irish sample when the two samples were examined together. In summary, increases in drinking were greater when positive alcohol effects were more likely and more desirable and when negative alcohol effects were less likely. Also, increases in drinking were greater when the adolescent thought that parents and friends drank more often and when friends were less likely to disapprove.

The age effect on changes in drinking was not significant for the Irish sample. However, it was negatively related to changes in drinking for the American sample. In other

words, after taking into account alcohol expectancies, values and social influence, increases in drinking were greater among younger American adolescents than among older American adolescents, whereas Irish adolescents of all ages changed their drinking in a similar fashion.

Predicting Alcohol Expectancies and Values

Some relationships between alcohol expectancies, values and drinking observed in the previous model (to be called Model A) changed in this model. First, both positive and negative expectancies, which were relatively less stable for Irish girls in Model A, were equally stable for the four groups when social influence was included in the model. Second, the cross-lagged effect of POSVT1→ POSET2 was not significant for Irish boys in Model A but became significant and equal for the four groups in the social learning model (to be called Model B). Third, the cross-lagged effect of POSVT1→ NEGET2, which was significant in Model A, became not significant for all four groups in Model B. Fourth, POSET1→POSVT2 became not significant for the two male groups and became equal in the two female groups. Fifth, the age effect on changes in negative expectancies, which was stronger for Irish girls in Model A, became equal for the four groups in Model B. Finally, the significant effect of drinking on changes in positive expectancies (Q-FT1→POSET2) for American girls became not significant in Model B.

Thus, adding social influence variables into the model changed the relationships between alcohol expectancies, values, and drinking. The results also showed that social influence further modified adolescent alcohol expectancies, particularly through friends' influence. Both friends' disapproval (SNFT1) and modeling of drinking (DRKFT1) at T1 were negatively associated with positive expectancies at T2. That is, increases in positive expectancies (POSET2) were greater when perceived disapproval by friends at T1 (SNFT1)

was less strong and when friends were perceived to drink (DRKFT1) less often at T1. However, the effect of (SNFT1→POSET2) was not significant for Irish girls and the effect of (DRKFT1→POSET2) was not significant for American girls.

The negative relationship between perceived friends' drinking (DRKFT1) and later positive expectancies (POSET2) appeared puzzling. Therefore, the regression procedure was examined again using forced entry method. That is, variables that were hypothesized to predict later positive expectancies were entered the regression model one by one. Although the findings were slightly different among the four groups, in general, it was positive expectancies, negative expectancies or positive values that affected the direction of the relationship between DRKFT1 and POSET2. In other words, when earlier expectancies or values were controlled, the relationship between DRKFT1 and POSET2 changed from positive to negative. That is, increase in positive expectancies was less for those reported friends drinking more often at T1. This may be a ceiling effect, i.e., positive expectancies for those reported friends drinking more often at T1 have been stabilized at a high level. This negative association was not found in the model for American girls. The relationship between DRKFT1 and POSET2 for American girls remained positive, although it later became not significant.

Social influence appeared to have a greater impact on negative expectancies for adolescents of this age group. In general, negative expectancies (NEGET2) were perceived as less likely when friends' disapproval was less strong (SNFT1), parents drank more often (DRKPT1) and friends drank more often (DRKFT1). While the four groups were equal in most of these cross-lagged effects, the effect of DRKFT1→NEGET2 was stronger for Irish boys.

Interestingly, it was found only for Irish boys that changes in negative expectancies were significantly affected by perceived parental disapproval (SNPT1). For Irish boys, negative expectancies were less likely when parental disapproval was stronger. A positive association, although not significant, between these two variables were found for the other three groups. Again, prediction of changes in negative expectancies for Irish boys was examined using regression procedure with forced entry method. The results showed that when earlier negative expectancies (NEGET1) were added in to the equation, the relationship between SNPT1 and NEGET2 changed from positive to negative. That is, increase in negative expectancies was less for those Irish boys who reported stronger parental disapproval at T1.

Predicting Perceived Social Influence

LM tests indicated that the four social influence variables varied in stability. Moreover, the four groups were not equally stable on these four variables. Overall, the American sample was more stable on the social influence variables than were the Irish sample. Moreover, American boys and girls were equally stable on the four social influence variables, whereas Irish boys were generally less stable on these four variables than were Irish girls.

Perceived parents' disapproval (SNPT2) was equally predicted by its stability and by perceived parents' drinking (DRKPT1) for the four groups. That is, those who reported parents drinking more often in the prior year decreased more in perceived parental disapproval. For Irish girls, changes in perceived parents' disapproval were also predicted by both perceived friends' disapproval (SNFT1) and perceived drinking by friends (DRKFT1). These two cross-lagged effects (SNFT1→SNPT2 and DRKFT1→SNPT2) were not significant in the models for the other three groups. Thus, increases in perceived parental disapproval

were greater for Irish girls when friends' disapproval was stronger and friends drank less often in the prior year.

Changes in perceived parents' disapproval (SNPT2) were also predicted by the two expectancy variables for all four groups. In other words, increases in perceived parents' disapproval were greater when negative expectancies (NEGET1) were more likely at T1. The cross-lagged effect of NEGET1→SNPT2 was statistically equal for the four groups. Perceived parents' disapproval, however, decreased more when positive alcohol effects (POSET1) were perceived as more likely at T1 for the American sample and for Irish boys. On the contrary, Irish girls increased more on perceived parental disapproval when positive expectancies were more likely at T1.

Perceived friends' disapproval (SNFT2) was equally predicted by its stability, positive expectancies (POSET1), negative expectancies (NEGET1) and positive values (POSVT1) for the four groups. Thus, perceived friends' disapproval increased more when negative alcohol effects were perceived as more likely but decreased more when positive alcohol effects were perceived as more likely and more desirable at T1. These three cross-lagged effects were equal for the four groups. Changes in perceived friends' disapproval was also predicted by negative values (NEGVT1) for the two female groups. That is, perceived friends' disapproval increased more for girls when negative alcohol effects were less desirable. This effect was not significant for boys in the two samples. Finally, for American girls, perceived friends' disapproval also decreased more when friends were perceived to drink more often (DRKFT1) in the prior year.

Perceived drinking by parents (DRKPT2) was equally predicted for the four groups by its stability and perceived parents' disapproval (SNPT1). Thus, perceived parents' drinking

decreased more when adolescents perceived stronger parental disapproval at T1. The four groups were equal in the cross-lagged effect of SNPT1→DRKPT2. For Irish boys, perceived parental drinking also increased more when negative alcohol effects were more desirable (NEGVT1) at T1.

Perceived drinking by friends (DRKFT2) was commonly predicted by its stability, perceived friends' disapproval (SNFT1), perceived drinking by parents (DRKPT1) and positive values (POSVT1) for the four groups. Moreover, American boys and girls and Irish girls were equally stable on perceived drinking by friends, whereas Irish boys were relatively less stable on this variable. The cross-lagged effects of SNFT1→DRKFT2, DRKPT1→DRKFT2 and POSVT1→DRKFT2 were statistically equal for the four groups. Thus, perceived friends' drinking increased more when friends' disapproval was less strong, parents drank more often, and positive alcohol effects were more desirable.

Two female-only effects were noteworthy. Increases in perceived friends' drinking were greater when perceived parental disapproval at T1 (SNPT1) was stronger for Irish girls. This effect was not significant for adolescents in the other three groups. Increases in perceived friends' drinking were greater when positive expectancies (POSET1) were perceived as more likely for American girls at T1. This effect was significant only for American girls.

Evidence showed that drinking further modified perceived social influence for adolescents of this age group. Perceived parents' disapproval (SNPT2) decreased more when adolescents drank more at T1. Whereas perceived friends' drinking (DRKFT2) increased more when adolescents' drinking were higher at T1. These two cross-lagged effects were equal for the four groups. Changes in perceived friends' disapproval and perceived parents'

drinking were not significantly affected by earlier drinking.

Age was a significant predictor in changes in some social influence variables. For the two samples, increases in perceived parental drinking were greater among younger adolescents than among older adolescents. This age effect was equal for boys and girls in the two samples. However, increases in perceived friends' drinking were greater among older adolescents than among younger adolescents in the Irish sample. This age effect was not significant in the American sample.

C. Planned Behavior Model

The planned behavior model tested whether attitudes, subjective norms and perceived behavior control significantly predicted later drinking. The planned behavior model in the present study differs from Ajzen's in two ways. In Ajzen's (1989) planned behavior theory, behavior is directly predicted by behavioral intention and perceived behavior control, while intention is a function of attitude and subjective norms. In the present planned behavior model, attitudes (i.e., alcohol expectancies and values) and subjective norms were allowed to directly predict drinking. The results from alcohol expectancy/value model and social learning model have shown that expectancies, values, and subjective norms directly predicted drinking. In addition, age, earlier drinking, and the inverse Mills ratio were also included in the model as predictors of later drinking.

Attitudes. The US-Irish project did not directly measure "attitudes" toward drinking by asking respondents questions about their affective responses (i.e., "like-dislike" or "pleasant-unpleasant") regarding alcohol use. However, some existing studies suggested that alcohol expectancies, to some extent, are equivalent to attitudes toward drinking. Leigh (1989) suggested that alcohol expectancies can be considered the cognitive component of attitudes toward drinking. In a study that compared the utility of three alcohol expectancy instruments, Leigh (1989) found that when the regression model included an attitude measure that closely corresponded to the drinking measure, the contribution of expectancies became smaller than if the attitude measure corresponded less well to the drinking measure. In another study, Stacy et al. (1990) investigated the relationship between expectancies, attitudes and drinking using Ajzen and Fishbein's (1980) theory of reasoned action model. The results, to some extent, were in line with Leigh's argument. In Stacy et al.'s model,

attitudes were predicted by positive and negative expectancies. Attitudes then directly predicted intention to drink and indirectly predicted future drinking. The results showed that positive expectancies also significantly and directly predicted intention to drink, but had no direct impact on future drinking. The path from negative expectancies to intention became significant only when the path from attitudes to intention was dropped from the model. The fit of model was similar when either negative expectancy→ intention or attitudes→intention was dropped from the model. This finding suggested that positive and negative expectancies together can replace attitudes in Ajzen and Fishbein's behavior model. Based on these empirical findings, alcohol expectancies and values were used in the present study to represent attitudes toward drinking.

"Perceived control of drinking" was measured by asking the respondent, on a 5-point scale, how likely that they would not be able to stop drinking (or become an alcoholic) if they were to drink 2 or 3 whole drinks of alcoholic beverages. A high score on this measure indicates that the respondent perceived high self-control of his or her own drinking.

Irish adolescents generally reported that being "unable to stop drinking" was less likely than American adolescents did. In addition, Irish boys reported it less likely than Irish girls did. On the contrary, American girls reported it less likely than American boys did. Older adolescents also reported it less likely than younger adolescents did (Table C-1).

Table C-1: Analysis of covariance and age-adjusted means for perceived behavior control

Item and effect	F	d.f.	p	Age-adjusted Mean
Perceived Control of Drinking				
Sample	86.12	1,3952	.000	US boys=4.03
Gender	.31	1,3952	.580	US girls=4.09
Age (β = .12)	53.40	1,3952	.000	Irish boys=4.44
Sample x gender	4.83	1,3952	.028	Irish girls=4.35

Commonality analyses were performed to examine the unique contributions of variables in the model. As is shown in Table C-2, the unique contribution of "perceived behavioral control" was significant only for American girls, but very small. It was not significant for the other three groups. Consistent with the findings in the social learning model, the unique contribution of social influence (i.e., subjective norms) was significant for the American sample, but not for the Irish sample. The analyses here further pointed out that unique contribution of subjective norms was only significant for American boys.

Table C-2: Commonality analyses for planned behavior model

	R^2 change	F change	d.f.	Sig. of F change
US male				
Age, Mills, Q-FT1	.492	214.379	(3,663)	.000
+ expectancies, values	.026	8.915	(4,659)	.000
+ norms	.009	6.056	(2,657)	.002
+ control	.000	.160	(1,656)	.689
US female				
Age, Mills, Q-FT1	.464	212.952	(3,737)	.000
+ expectancies, values	.022	7.828	(4,733)	.000
+ norms	.004	2.602	(2,731)	.075
+ control	.004	5.598	(1,730)	.018
Irish male				
Age, Mills, Q-FT1	.471	181.621	(3,611)	.000
+ expectancies, values	.022	6.664	(4,607)	.000
+ norms	.002	1.308	(2,605)	.271
+ control	.000	.239	(1,604)	.625
Irish female				
Age, Mills, Q-FT1	.518	254.804	(3,711)	.000
+ expectancies, values	.014	5.413	(4,707)	.000
+ norms	.002	1.546	(2,705)	.214
+ control	.000	.025	(1,704)	.874

Note: Shaded rows are the unique contribution of "perceived behavior control".

The bivariate correlation was used to further examine the associations between variables (Table C-3). All variables except "perceived behavior control" (CNTRLT1 and CNTRLT2) have been discussed in the previous models. Therefore, only the correlation

Table C-3: Bivariate correlation for variables in planned behavior model

US Male	POSE T1	NEGE T1	POSV T1	NEGV T1	SNP T1	SNF T1	CNTRL T1	Q-F T1	POSE T2	NEGE T2	POSV T2	NEGV T2	SNP T2	SNF T2	CNTRL T2	Q-F T2
POSET1	1.000															
NEGET1	-.124*	1.000														
POSVT1	.515*	-.229*	1.000													
NEGVT1	.080*	-.031	.013	1.000												
SNPT1	-.116*	.393*	-.163*	-.112*	1.000											
SNFT1	-.329*	.497*	-.341*	-.112*	.422*	1.000										
CNTRLT1	.082*	-.458*	.140*	-.072	-.126*	-.260*	1.000									
Q-FT1	.293*	-.537*	.353*	.185*	-.345*	-.454*	.179*	1.000								
POSET2	.563*	-.110*	.418*	.030	-.119*	-.250*	.096*	.196*	1.000							
NEGET2	-.214*	.662*	-.308*	-.005	.371*	.476*	-.358*	-.452*	-.101*	1.000						
POSVT2	.361*	-.165*	.574*	-.025	-.120*	-.315*	.103*	.245*	.508*	-.206*	1.000					
NEGVT2	.040	-.011	-.022	.411*	-.049	-.036	-.054	.083*	.015	.053	-.076*	1.000				
SNPT2	-.157*	.370*	-.168*	-.082*	.679*	.368*	-.146*	-.336*	-.091*	.439*	-.141*	-.091*	1.000			
SNFT2	-.318*	.372*	-.317*	-.094*	.303*	.656*	-.180*	-.361*	-.303*	.451*	-.356*	-.126*	.383*	1.000		
CNTRLT2	.110*	-.263*	.147*	-.015	-.112*	-.231*	.470*	.145*	.067	-.491*	.145*	-.165*	-.151*	-.224*	1.000	
Q-FT2	.320*	-.452*	.354*	.130*	-.317*	-.447*	.186*	.701*	.310*	-.488*	.334*	.126*	-.342*	-.468*	.154*	1.000

US Female	POSE T1	NEGE T1	POSV T1	NEGV T1	SNP T1	SNF T1	CNTRL T1	Q-F T1	POSE T2	NEGE T2	POSV T2	NEGV T2	SNP T2	SNF T2	CNTRL T2	Q-F T2
POSET1	1.000															
NEGET1	-.222*	1.000														
POSVT1	.585*	-.169*	1.000													
NEGVT1	.126*	-.030	.019	1.000												
SNPT1	-.211*	.331*	-.140*	-.095*	1.000											
SNFT1	-.458*	.435*	-.353*	-.106*	.415*	1.000										
CNTRLT1	.161*	-.444*	.098*	.005	-.206*	-.280*	1.000									
Q-FT1	.456*	-.444*	.349*	.165*	-.338*	-.492*	.235*	1.000								
POSET2	.595*	-.193*	.500*	.039	-.161*	-.400*	.161*	.329*	1.000							
NEGET2	-.286*	.647*	-.172*	-.041	.277*	.385*	-.340*	-.411*	-.224*	1.000						
POSVT2	.503*	-.142*	.662*	.025	-.124*	-.323*	.124*	.276*	.620*	-.131*	1.000					
NEGVT2	.010	.018	-.055	.434*	-.003	-.008	-.049	.034	.022	.013	-.016	1.000				
SNPT2	-.203*	.264*	-.154*	-.106*	.675*	.361*	-.128*	-.319*	-.179*	.297*	-.131*	-.029	1.000			
SNFT2	-.355*	.352*	-.283*	-.032	.323*	.663*	-.242*	-.369*	-.430*	.438*	-.331*	-.025	.426*	1.000		
CNTRLT2	.202*	-.331*	.057	.014	-.183*	-.285*	.492*	.184*	.184*	-.451*	.120*	.023	-.137*	-.317*	1.000	
Q-FT2	.411*	-.383*	.326*	.140*	-.256*	-.435*	.257*	.679*	.444*	-.442*	.355*	.074*	-.282*	-.456*	.178*	1.000

Note: POSE = positive expectancies; NEGE = negative expectancies; POSV = positive values; NEGV = negative values; SNP = parents' disapproval; SNF = friends' disapproval; CNTRL = perceived control of drinking; Q-F = quantity-frequency drinking; * $p < .05$

Table C-3: (continued)

Irish Male	POSE T1	NEGE T1	POSV T1	NEGV T1	SNP T1	SNF T1	CNTRL T1	Q-F T1	POSE T2	NEGE T2	POSV T2	NEGV T2	SNP T2	SNF T2	CNTRL T2	Q-F T2
POSET1	1.000															
NEGET1	-.089*	1.000														
POSVT1	.403*	-.115*	1.000													
NEGVT1	.028	.051	.024	1.000												
SNPT1	-.038	.495*	-.120*	.011	1.000											
SNFT1	-.256*	.370*	-.308*	-.024	.308*	1.000										
CNTRLT1	.167*	-.484*	.159*	-.006	-.274*	-.286*	1.000									
Q-FT1	.165*	-.512*	.269*	.125*	-.418*	-.353*	.269*	1.000								
POSET2	.469*	-.014	.242*	.069	.006	-.179*	.135*	.046	1.000							
NEGET2	-.135*	.622*	-.170*	.091*	.362*	.346*	-.310*	-.398*	-.025	1.000						
POSVT2	.303*	-.020	.634*	.062	-.041	-.289*	.102*	.189*	.396*	-.068	1.000					
NEGVT2	.030	.088*	-.026	.340*	.018	.008	-.076	.042	.052	.148*	-.040	1.000				
SNPT2	-.090*	.454*	-.129*	.060	.679*	.291*	-.264*	-.382*	-.044	.460*	-.102*	.107*	1.000			
SNFT2	-.217*	.283*	-.268*	-.049	.225*	.479*	-.206*	-.260*	-.263*	.360*	-.327*	.033	.336*	1.000		
CNTRLT2	.175*	-.310*	.094*	-.042	-.131*	-.228*	.409*	.165*	.174*	-.514*	.108*	-.060	-.241*	-.243*	1.000	
Q-FT2	.225*	-.441*	.253*	.050	-.351*	-.334*	.229*	.680*	.144*	-.422*	.251*	.064	-.365*	-.315*	.202*	1.000

Irish Female	POSE T1	NEGE T1	POSV T1	NEGV T1	SNP T1	SNF T1	CNTRL T1	Q-F T1	POSE T2	NEGE T2	POSV T2	NEGV T2	SNP T2	SNF T2	CNTRL T2	Q-F T2
POSET1	1.000															
NEGET1	-.118*	1.000														
POSVT1	.588*	-.105*	1.000													
NEGVT1	.087*	.079*	.044	1.000												
SNPT1	-.107*	.420*	-.115*	-.044	1.000											
SNFT1	-.356*	.440*	-.389*	-.133*	.378*	1.000										
CNTRLT1	.098*	-.493*	.098*	-.154*	-.171*	-.209*	1.000									
Q-FT1	.339*	-.453*	.348*	.212*	-.379*	-.452*	.173*	1.000								
POSET2	.444*	-.037	.327*	.066	.026	-.122*	.048	.159*	1.000							
NEGET2	-.172*	.599*	-.156*	.072	.322*	.390*	-.336*	-.376*	-.058	1.000						
POSVT2	.420*	-.031	.561*	.070	-.002	-.232*	.060	.232*	.535*	-.077*	1.000					
NEGVT2	.077*	.093*	.053	.524*	-.023	-.015	-.135*	.126*	.059	.153*	.029	1.000				
SNPT2	-.100*	.430*	-.111*	-.007	.659*	.404*	-.123*	-.375*	.026	.438*	-.035	.019	1.000			
SNFT2	-.251*	.313*	-.303*	-.042	.188*	.518*	-.128*	-.333*	-.249*	.364*	-.372*	-.011	.347*	1.000		
CNTRLT2	.113*	-.235*	.134*	-.096*	-.109*	-.176*	.340*	.132*	.115*	-.450*	.111*	-.219*	-.196*	-.183*	1.000	
Q-FT2	.316*	-.415*	.303*	.161*	-.307*	-.416*	.171*	.709*	.243*	-.444*	.267*	.164*	-.393*	-.425*	.201*	1.000

Note: POSE = positive expectancies; NEGE = negative expectancies; POSV = positive values; NEGV = negative values; SNP = parents' disapproval; SNF = friends' disapproval; CNTRL = perceived control of drinking; Q-F = quantity-frequency drinking; * $p < .05$

coefficients between "perceived behavioral control" and other variables are discussed here. As is shown in Table C-3, "perceived behavioral control" was not strongly associated with other variables, either cross-sectional or longitudinal. Relatively stronger associations were found between behavioral control and negative alcohol expectancies for the four groups. Specifically, greater perceived behavioral control was associated with lower likelihood of negative expectancies.

Structural equation modeling was used to further examine the interactive processes between variables in the planned behavior model. Table C-4 presents the initial model and the results of the cross-group comparison are summarized in Table C-5.

Table C-4: Planned behavior model: Initial model and equality constraints

Predictor	Dependent Variable							
	POSE T2	NEGE T2	POSV T2	NEGV T2	SNP T2	SNF T2	CNTRL T2	Q-F T2
Control								
Age	x	x	x	x	x	x	x	x
Mills	x	x	x	x	x	x	x	x
Attitude								
POSET1	x	x	x	x	x	x	x	x
NEGET1	x	x	x	x	x	x	x	x
POSVT1	x	x	x	x	x	x	x	x
NEGVT1	x	x	x	x	x	x	x	x
Norms								
SNPT1	x	x	x	x	x	x	x	x
SNFT1	x	x	x	x	x	x	x	x
CNTRLT1	x	x	x	x	x	x	x	x
Q-FT1	x	x	x	x	x	x	x	x

Note: 1. POSE = positive expectancies; NEGE = negative expectancies; POSV = positive values; NEGV = negative values; SNP = parents' disapproval; SNF = friend's disapproval; CNTRL = perceived self-control of drinking; Q-F = quantity-frequency drinking.
2. All but the shaded structural coefficients were tested for equivalence across the four groups.

Table C-5: Planned behavior model: Results of cross-group comparisons

US male	Dependent Variables							
Predictor	POSET2	NEGET2	POSVT2	NEGVT2	SNPT2	SNFT2	CNTRLT2	Q-FT2
Age	-.053*	-.047*	-.106*	-.071*	-.107*	.010	.008	-.036
Mills	.041	-.012	-.039	-.052	-.000	.035	.044	-.020
POSET1	.447*	-.053*	.065*	.016	-.036*	-.035*	.066*	.070*
NEGET1	.003	.514*	.032	.011	.040*	.057*	-.064*	-.070*
POSVT1	.173*	-.030	.517*	-.022	-.005	-.055*	-.034	.035*
NEGVT1	.008	.040*	-.004	.386*	.005	-.012	-.021	.024
SNPT1	.000	.014	.001	-.023	.589*	-.003	.008	-.005
SNFT1	-.046	.095*	-.074*	.014	.046*	.584*	-.055*	-.071*
CNTRLT1	.038	-.050*	.020	-.040*	.035*	-.002	.421*	.024
Q-FT1	-.011	-.087*	.047*	.049*	-.075*	-.034*	-.004	.596*
R^2	.341	.467	.363	.162	.488	.442	.232	.512

US female	Dependent Variables							
Predictor	POSET2	NEGET2	POSVT2	NEGVT2	SNPT2	SNFT2	CNTRLT2	Q-FT2
Age	-.050*	-.047*	-.103*	.039	-.105*	.008	.008	-.038
Mills	-.030	.047	-.088*	.130*	.046	.027	-.049	-.008
POSET1	.450*	-.057*	.151*	.024	-.038*	-.032*	.067*	.079*
NEGET1	.003	.502*	.030	.015	.039*	.048*	-.060*	-.073*
POSVT1	.172*	-.031	.529*	-.033	-.005	-.050*	-.034	.039*
NEGVT1	.005	.031*	-.003	.412*	.004	.051*	-.015	.019
SNPT1	.000	.014	.001	-.033	.588*	.053*	.007	-.005
SNFT1	-.138*	.111*	-.085*	.023	.054*	.582*	-.150*	-.089*
CNTRLT1	.035	-.050*	.020	-.057*	.035*	-.002	.401*	.026
Q-FT1	-.009	-.077*	.041*	-.045	-.065*	-.026*	-.003	.557*
R^2	.421	.448	.480	.197	.477	.452	.264	.503

Note: 1. POSE = positive expectancies; NEGE = negative expectancies; POSV = positive values; NEGV = negative values; SNP = parents' disapproval; SNF = friend's disapproval; CNTRL = perceived self-control of drinking; Q-F = quantity-frequency drinking.

2. Numbers in the cells are standardized regression coefficients (β). Please see Table C-5 in Appendix C for non-standardized coefficient (b) and standard error for each coefficient.
3. Underlined coefficients were statistically not equal for the four group.
4. * $p < .05$.

Table C-5: (continued)

Irish male	Dependent Variables							
Predictor	POSET2	NEGET2	POSVT2	NEGVT2	SNPT2	SNFT2	CNTRLT2	Q-FT2
Age	-.062*	-.060*	-.143*	-.097*	-.133*	.026	.011	.067*
Mills	.017	.106*	.019	.010	.124*	.072	-.047	.037
POSET1	.422*	-.055*	.072*	.018	-.037*	-.078*	.078*	.071*
NEGET1	.003	.485*	.032	.011	.037*	.115*	-.069*	-.065*
POSVT1	.052	-.028	.520*	-.022	-.004	-.112*	-.036	.032*
NEGVT1	.006	.036*	-.004	.363*	.005	-.023	-.021	.021
SNPT1	.000	.015	.001	-.027	.492*	-.007	.010	-.006
SNFT1	-.024	.055*	-.125*	.009	.026*	.344*	-.036*	-.041*
CNTRLT1	.028	-.041*	.017	-.035*	-.056*	-.004	.389*	.019
Q-FT1	-.010	-.086*	.050*	.051*	-.072*	-.072*	-.004	.574*
R^2	.215	.446	.399	.155	.532	.264	.210	.480

Irish female	Dependent Variables							
Predictor	POSET2	NEGET2	POSVT2	NEGVT2	SNPT2	SNFT2	CNTRLT2	Q-FT2
Age	-.057*	-.189*	-.114*	-.087*	-.239*	.015	.011	.063*
Mills	-.038	.018	-.043	.013	.026	.060	-.088*	-.059*
POSET1	.358*	-.057*	.067*	.019	.044	-.051*	.086*	.078*
NEGET1	.003	.391*	.029	.011	.036*	.072*	-.073*	-.069*
POSVT1	.169*	-.031	.511*	-.025	-.005	-.077*	.059	.037*
NEGVT1	.006	.033*	-.003	.482*	.004	-.013	-.020	.021
SNPT1	.000	.014	.001	-.026	.458*	-.004	.010	-.006
SNFT1	.041	.080*	-.060*	.013	.126*	.429*	-.056*	-.063*
CNTRLT1	.031	-.043*	.017	-.038*	.029*	-.003	.265*	.022
Q-FT1	-.009	-.080*	.042*	.049*	-.067*	-.043*	-.004	.577*
R^2	.209	.429	.343	.278	.519	.300	.155	.532

Note: 1. POSE = positive expectancies; NEGE = negative expectancies; POSV = positive values; NEGV = negative values; SNP = parents' disapproval; SNF = friend's disapproval; CNTRL = perceived self-control of drinking; Q-F = quantity-frequency drinking.

2. Numbers in the cells are standardized regression coefficients (β). Please see Table C-5 in Appendix C for non-standardized coefficient (b) and standard error for each coefficient.
3. Underlined coefficients were statistically not equal for the four group.
4. * $p < .05$.

The results only partially supported the planned behavior theory. Consistent with the previous analyses, positive expectancies (POSET1), negative expectancies (NEGET1) and positive values (POSVT1) significantly predicted changes in drinking. In addition, perceived friends' disapproval, but not parents' disapproval, significantly predicted changes in drinking. Perceived behavioral control (CNTRLT1) did not significantly predict changes in drinking for any group. This model also poorly predicted changes in perceived control of drinking (CNTRLT2). Analyses for this model stopped here because it becomes similar to the social learning model (i.e., a social learning model with no behavioral modeling) when behavioral control is dropped.

D. Problem Behavior Model

The problem behavior model examined the association between drinking and the psychological development during adolescence. In this model, drinking is a function of the individual's personal factors (self-esteem, unconventionality, religiosity) and perceived environment (perceived parents' and friends' disapproval of drinking, perceived friends' models of drinking). Perceived drinking by parents was not included because it was not considered important in adolescent drinking by the problem behavior theory. A variable representing general deviance was also included in the model in order to examine the relationship between drinking and the general deviant orientation.

Self-esteem. Three groups of variables were used to measure self-esteem. They correspond to three areas of adolescent life from which self-esteem can be gained: family, schooling or work, and peers. Each area of self-esteem was measured with four questions. However, the area of "school or work" was not included in the present study because too many missing data were found in the measures. The Chronbach's α for family- and peer-related self-esteem were .79 and .64 for the American sample, and .76 and .62, respectively, for the Irish sample. Indices of family- and peer-related self-esteem were each computed by taking the mean of the four measures.

Unconventionality. Social unconventionality was measured by asking the respondents how much they agree or disagree (on 5-point scales) with three statements regarding obeying rules at school (or at work), obeying the law in general and doing what their parents asked them to do. The first two items, in fact, measured the orientation of lawlessness and the third item, independence from parents' authority. Considering that these two psychological orientations may have different impacts on adolescent behavior, an index

of lawlessness was computed by taking the mean of the first two items and the third item by itself represents independence from parents' authority. Higher scores on these two measures indicate less law-abidance (or more lawlessness) and greater independence.

Religiosity. Religiosity was measured with three questions asking the respondent how often he/she attended church or religious services, how much he/she liked or disliked church or religious services, and how important religion was to him/her personally. Chronbach's α was .80 for the American sample and .76 for the Irish sample. An index of religiosity was computed by standardizing each of these items and then taking their mean. A higher score on religiosity indicates that the respondent is more religious.

General deviance. General deviance was measured by using a deviance scale, consisting of behaviors that are considered potentially deviant or problematic for young people. These behaviors range from relatively minor (e.g., lying to parents, lying to teachers or bosses, cheating in school) to relatively serious (e.g., stealing, shoplifting, fist fight and vandalism). The respondent was asked how often (none -- more than 12 times) in the previous year he or she had engaged in each of the behaviors.

The school survey questionnaire has two more items (i.e., cutting classes and staying out all night without permission) than the mail survey does. The correlation between the full scale and the scale without these two items was .97 for the American school sample, and .98 for the Irish school sample. In addition, Chronbach's α for the full scale was .78 for the American sample and .82 for the Irish sample, slightly better than .77 (US) and .81 (Irish) for the scales without these two items. Therefore, it was decided not to drop these two items from the scale used in the school survey. In other words, the scale of deviant behavior for school survey has 10 items, while the mail survey has only 8 items. Each item was first re-

coded into number of times. A measure of "general deviance" was then computed by taking the mean of the 10 behavior items for school survey, and of the 8 items for mail survey. Because the data were skewed, the mean scores were further log transformed prior to analyses. A higher score on the general deviant behavior indicates that the respondent engaged in more deviant behaviors.

A series of 2 (sample) by 2 (gender) analyses of covariance, adjusting for age, were performed to these measures to examine whether the two samples differed in these aspects. As is shown in Table D-1, adolescents scored similarly in family-related self-esteem regardless of sample, gender and age. As regards peer-related self-esteem, boys scored higher than girls did. Also, older adolescents scored higher in peer-related self-esteem than younger adolescents did.

The results showed that the two samples did not differ in their attitudes toward rules at school or work. However, American adolescents were generally less law-abiding than were Irish adolescents. In addition, boys were less law-abiding than girls within each sample. Both attitudes toward rules at work or school and law varied with age, indicating that adolescents became more law-abiding as they aged. Finally, it is interesting to note that both Irish and American adolescents (boys and girls and of all ages) shared a similar attitude toward parents' authority.

With regard to religiosity, Irish adolescents reported attending church services more often than did American adolescents. However, Irish adolescents were also less favorable toward church services and rated religion less important than did American adolescents. Overall, girls were more religious than were boys within each sample. Moreover, greater gender differences were found in all three religiosity items in the Irish sample than in the

American sample. That is, among the four groups, Irish girls reported attending church services most often, whereas church services were least favorable and least important for Irish boys. Also, older adolescents reported attending church services less often, but,

Table D-1: Analyses of covariance and age-adjusted means for variables of self-esteem, unconventionality, religiosity and deviance

Item and effect	F	d.f.	p	Age-adjusted mean			
				US		IRISH	
				boy	girl	boy	girl
Self-esteem							
1. Family				4.13	4.12	4.13	4.17
Sample	1.04	1,3898	.307				
Gender	.52	1,3898	.473				
Age	1.29	1,3898	.256				
Sample x gender	1.33	1,3898	.249				
2. Peer				3.55	2.42	2.71	2.43
Sample	1.25	1,3900	.264				
Gender	11.33	1,3900	.001				
Age ($\beta = .06$)	14.04	1,3900	.000				
Sample x gender	3.68	1,3900	.055				
Unconventionality							
1. Obey rules at school or work				2.65	2.42	2.71	2.43
Sample	1.15	1,3748	.283				
Gender	60.13	1,3748	.000				
Age ($\beta = -.09$)	24.75	1,3748	.000				
Sample x gender	.96	1,3748	.329				
2. Obey the law				2.71	2.34	2.53	2.23
Sample	14.27	1,3748	.000				
Gender	94.76	1,3748	.000				
Age ($\beta = -.05$)	9.14	1,3748	.003				
Sample x gender	1.35	1,3748	.245				
3. Do what parents say				2.82	2.87	2.89	2.81
Sample	.02	1,3748	.889				
Gender	.08	1,3748	.776				
Age	.64	1,3748	.424				
Sample x gender	3.49	1,3748	.062				

Table D-1: (continued)

Item and effect	F	d.f.	p	Age-adjusted mean			
				US		IRISH	
				boy	girl	boy	girl
Religiosity							
1. Church attendance				3.31	3.45	3.76	4.44
Sample	115.01	1,3851	.000				
Gender	42.00	1,3851	.000				
Age (β = -.12)	51.74	1,3851	.000				
Sample x gender	18.13	1,3851	.000				
2. Like going to church services				2.96	3.19	2.51	2.90
Sample	94.74	1,3851	.000				
Gender	76.56	1,3851	.000				
Age (β = .05)	8.17	1,3851	.004				
Sample x gender	5.28	1,3851	.022				
3. Importance of religion in daily life				3.76	4.02	3.50	4.02
Sample	6.75	1,3851	.009				
Gender	68.05	1,3851	.000				
Age	2.35	1,3851	.126				
Sample x gender	7.37	1,3851	.007				
Deviance				3.1	2.7	3.3	2.4
Sample	1.77	1,3900	.183				
Gender	182.73	1,3900	.000				
Age (β = -.11)	42.20	1,3900	.000				
Sample x gender	28.35	1,3900	.000				

interestingly, were more favorable toward church services than younger adolescents. Adolescents of all ages did not differ in the importance of religion.

As regards general deviance, overall, boys reported more problem behaviors than did girls. Gender difference was greater in the Irish sample than in the American sample. That is, Irish boys reported the greatest number of problem behaviors, whereas Irish girls reported the smallest number of problem behaviors among the four groups. Moreover, younger adolescents reported more problem behaviors than did older adolescents.

A commonality analysis (Table D-2) indicated that the unique contributions of the problem behavior variables after earlier drinking, age and the inverse Mills ratio were taken into account, although small, were significant for all of the four groups. The increased R^2s were relatively greater in the two American groups than in the Irish groups.

Table D-2: Commonality analyses for the variables in the problem behavior model

	R^2 change	F change	d.f.	Sig. of F change
US male				
Age, Mills, Q-FT1	.496	219.14	(3,668)	.000
+ problem behavior variables	.047	7.48	(9,659)	.000
US female				
Age, Mills, Q-FT1	.465	214.07	(3,738)	.000
+ problem behavior variables	.028	4.49	(9,729)	.000
Irish male				
Age, Mills, Q-FT1	.463	174.19	(3,607)	.000
+ problem behavior variables	.017	2.174	(9,598)	.022
Irish female				
Age, Mills, Q-FT1	.526	260.86	(3,704)	.000
+ problem behavior variables	.020	3.34	(9,695)	.001

Note: shaded rows are unique contribution of the variables.

The associations between variables were examined through the bivariate correlation (Table D-3). The cross-sectional correlation coefficients between the predictors and the two behavior variables were greater than the longitudinal correlation coefficients. Later drinking was moderately related to unconventionality (LAWT1 and INDEPT1), perceived disapproval by parents (SNPT1) and disapproval by friends (SNFT1). The correlation coefficients between drinking and self-esteem and religiosity were relatively small. Later deviance was also moderately related to unconventionality (LAWT1 and INDEPT1) and earlier drinking (Q-FT1). The correlation coefficients between religiosity (RELIG) and behaviors (drinking and general deviance) were greater for the Irish sample than for the American sample. Moreover, they were greater for girls than for boys in each sample. However, the correlation generally

Table D-3: Bivariate correlation for variables in problem behavior model

US Male	LAW T1	INDEP T1	PEER T1	HOME T1	RELIG T1	SNP T1	SNF T1	DRKF T1	DEV T1	Q-F T1	LAW T2	INDEP T2	PEER T2	HOME T2	RELIG T2	SNP T2	SNF T2	DRKF T2	DEV T2	Q-F T2
LAWT1	1.000																			
INDEPT1	.603*	1.000																		
PEERT1	.037	-.098*	1.000																	
HOMET1	-.220*	-.368*	.306*	1.000																
RELIGT1	-.194*	-.231*	.065	.095*	1.000															
SNPT1	-.200*	-.118*	-.057	.054	.130*	1.000														
SNFT1	-.312*	-.212*	.012	.071	.137*	.418*	1.000													
DRKFT1	.289*	.100*	.132*	-.060	-.072	-.355*	-.525*	1.000												
DEVT1	.474*	.343*	.098*	-.228*	-.117*	-.045	-.224*	.327*	1.000											
Q-FT1	.380*	.215*	.207*	-.112*	-.117*	-.347*	-.449*	.667*	.455*	1.000										
LAWT2	.639*	.427*	.045	-.149*	-.122*	-.097*	-.241*	.156*	.396*	.278*	1.000									
INDEPT2	.460*	.556*	-.050	-.257*	-.122*	-.060	-.193*	.060	.300*	.136*	.574*	1.000								
PEERT2	.059	-.087*	.686*	.243*	.076	-.006	.006	.132*	.143*	.156*	.097*	-.010	1.000							
HOMET2	-.211*	-.291*	.244*	.632*	.078*	.046	.095*	-.098*	-.234*	-.162*	-.178*	-.315*	.348*	1.000						
RELIGT2	-.223*	-.233*	.043	.109*	.856*	.160*	.165*	-.070	-.124*	-.145*	-.180*	-.183*	.074	.110*	1.000					
SNPT2	-.154*	-.069	-.040	.027	.134*	.684*	.371*	-.332*	-.032	-.337*	-.124*	-.037	.017	.052	.175*	1.000				
SNFT2	-.217*	-.129*	.026	.068	.132*	.298*	.648*	-.399*	-.190*	-.354*	-.256*	-.204*	.019	.072	.183*	.393*	1.000			
DRKFT2	.213*	.062	.151*	-.011	-.090*	-.297*	-.436*	.659*	.267*	.500*	.208*	.098*	.149*	-.018	-.129*	-.367*	-.538*	1.000		
DEVT2	.334*	.234*	.041	-.184*	-.066	.086*	-.150*	.092*	.649*	.240*	.495*	.412*	.135*	-.231*	-.101*	.067	-.195*	.154*	1.000	
Q-FT2	.331*	.190*	.162*	-.087*	-.081*	-.316*	-.442*	.581*	.417*	.698*	.370*	.168*	.193*	-.105*	-.117*	-.346*	-.465*	.625*	.325*	1.000

LAW=lawlessness; INDEP=independence from parents; PEER=peer-related self-esteem; HOME=family-related self-esteem; RELIG=religiosity; SNP=perceived parents' disapproval of drinking by respondent; SNF=perceived friends' disapproval of drinking by respondent; DRKF=perceived drinking by friends; DEV=general deviant behavior; Q-F=quantity-frequency drinking.

* $p<.05$

Table D-3: (continued)

US Female	LAW T1	INDEP T1	PEER T1	HOME T1	RELIG T1	SNP T1	SNF T1	DRKF T1	DEV T1	Q-F T1	LAW T2	INDEP T2	PEER T2	HOME T2	RELIG T2	SNP T2	SNF T2	DRKF T2	DEV T2	Q-F T2
LAWT1	1.000																			
INDEPT1	.511*	1.000																		
PEERT1	.031	-.094*	1.000																	
HOMET1	-.277*	-.371*	.303*	1.000																
RELIGT1	-.171*	-.262*	.078*	.139*	1.000															
SNPT1	-.142*	-.106*	-.011	.040	.170*	1.000														
SNFT1	-.316*	-.242*	-.050	.125*	.309*	.402*	1.000													
DRKFT1	.297*	.215*	.086*	-.139*	-.247*	-.317*	-.550*	1.000												
DEVT1	.459*	.419*	-.010	-.333*	-.145*	-.095*	-.295*	.292*	1.000											
Q-FT1	.390*	.285*	.107*	-.187*	-.243*	-.328*	-.492*	.613*	.427*	1.000										
LAWT2	.644*	.432*	-.010	-.172*	-.239*	-.091*	-.267*	.196*	.392*	.264*	1.000									
INDEPT2	.392*	.507*	-.089*	-.228*	-.230*	-.083*	-.193*	.127*	.352*	.177*	.550*	1.000								
PEERT2	.064	-.026	.653*	.214*	.069	-.029	-.063	.078*	.045	.156*	.017	-.076*	1.000							
HOMET2	-.199*	-.278*	.311*	.645*	.093*	.014	.056	-.063	-.261*	-.098*	-.219*	-.307*	.381*	1.000						
RELIGT2	-.174*	-.245*	.098*	.132*	.828*	.176*	.266*	-.219*	-.133*	-.190*	-.298*	-.282*	.089*	.133*	1.000					
SNPT2	-.123*	-.109*	-.025	-.011	.210*	.671*	.363*	-.329*	-.054	-.319*	-.129*	-.081*	-.071	-.041	.200*	1.000				
SNFT2	-.247*	-.219*	-.022	.103*	.303*	.317*	.668*	-.481*	-.253*	-.372*	-.278*	-.211*	-.036	.045	.290*	.427*	1.000			
DRKFT2	.276*	.225*	.068	-.116*	-.233*	-.285*	-.507*	.628*	.267*	.521*	.258*	.185*	.082*	-.030	-.243*	-.324*	-.583*	1.000		
DEVT2	.356*	.327*	-.035	-.211*	-.132*	-.011	-.171*	.092*	.635*	.205*	.455*	.423*	-.033	-.286*	-.156*	.041	-.182*	.135*	1.000	
Q-FT2	.359*	.288*	.098*	-.156*	-.231*	-.243*	-.434*	.497*	.375*	.681*	.361*	.250*	.106*	-.091*	-.227*	-.280*	-.459*	.599*	.308*	1.000

LAW=lawlessness; INDEP=independence from parents; PEER=peer-related self-esteem; HOME=family-related self-esteem; RELIG=religiosity; SNP=perceived parents' disapproval of drinking by respondent; SNF=perceived friends' disapproval of drinking by respondent; DRKF=perceived drinking by friends; DEV=general deviant behavior; Q-F=quantity-frequency drinking.

* $p<.05$

Table D-3: (continued)

Irish Male	LAW T1	INDEP T1	PEER T1	HOME T1	RELIG T1	SNP T1	SNF T1	DRKF T1	DEV T1	Q-F T1	LAW T2	INDEP T2	PEER T2	HOME T2	RELIG T2	SNP T2	SNF T2	DRKF T2	DEV T2	Q-F T2
LAWT1	1.000																			
INDEPT1	.533*	1.000																		
PEERT1	.049	-.011	1.000																	
HOMET1	-.372*	-.392*	.246*	1.000																
RELIGT1	-.303*	-.313*	.019	.265*	1.000															
SNPT1	-.053	-.114*	-.132*	-.012	.159*	1.000														
SNFT1	-.208*	-.253*	-.146*	.083*	.218*	.321*	1.000													
DRKFT1	.184*	.238*	.165*	-.122*	-.165*	-.485*	-.438*	1.000												
DEVT1	.489*	.441*	.092*	-.333*	-.296*	-.045	-.263*	.274*	1.000											
Q-FT1	.312*	.295*	.217*	-.125*	-.243*	-.422*	-.363*	.564*	.434*	1.000										
LAWT2	.576*	.381*	.040	-.239*	-.255*	.042	-.153*	.095*	.372*	.216*	1.000									
INDEPT2	.391*	.473*	.023	-.254*	-.216*	-.019	-.167*	.066	.283*	.167*	.561*	1.000								
PEERT2	-.017	.016	.638*	.201*	.021	-.127*	-.132*	.136*	.017	.202*	.039	-.005	1.000							
HOMET2	-.261*	-.266*	.221*	.507*	.229*	.036	.082*	-.121*	-.253*	-.106*	-.336*	-.336*	.325*	1.000						
RELIGT2	-.240*	-.264*	.019	.200*	.736*	.067	.147*	-.140*	-.237*	-.180*	-.254*	-.212*	.029	.202*	1.000					
SNPT2	-.050	-.088*	-.126*	-.035	.136*	.678*	.308*	-.450*	-.034	-.369*	.067	-.014	-.141*	-.028	.065	1.000				
SNFT2	-.147*	-.161*	-.133*	.053	.127*	.235*	.503*	-.325*	-.176*	-.261*	-.155*	-.164*	-.135*	.005	.144*	.341*	1.000			
DRKFT2	.133*	.201*	.178*	-.063	-.134*	-.451*	-.396*	.636*	.261*	.497*	.059	.073	.148*	-.102*	-.124*	-.457*	-.394*	1.000		
DEVT2	.354*	.284*	.072	-.194*	-.216*	.152*	-.174*	.046	.607*	.256*	.498*	.380*	.077	-.191*	-.266*	.171*	-.174*	.097*	1.000	
Q-FT2	.220*	.276*	.172*	-.087*	-.211*	-.358*	-.344*	.436*	.312*	.673*	.230*	.238*	.238*	-.089*	-.206*	-.353*	-.318*	.554*	.291*	1.000

LAW=lawlessness; INDEP=independence from parents; PEER=peer-related self-esteem; HOME=family-related self-esteem; RELIG=religiosity; SNP=perceived parents' disapproval of drinking by respondent; SNF=perceived friends' disapproval of drinking by respondent; DRKF=perceived drinking by friends; DEV=general deviant behavior; Q-F=quantity-frequency drinking.

* $p<.05$

Table D-3: (continued)

Irish Female	LAW T1	INDEP T1	PEER T1	HOME T1	RELIG T1	SNP T1	SNF T1	DRKF T1	DEV T1	Q-F T1	LAW T2	INDEP T2	PEER T2	HOME T2	RELIG T2	SNP T2	SNF T2	DRKF T2	DEV T2	Q-F T2
LAWT1	1.000																			
INDEPT1	.551*	1.000																		
PEERT1	-.020	-.062	1.000																	
HOMET1	-.422*	-.386*	.238*	1.000																
RELIGT1	-.287*	-.294*	.112*	.308*	1.000															
SNPT1	-.108*	-.131*	-.002	.112*	.263*	1.000														
SNFT1	-.279*	-.322*	-.029	.162*	.195*	.379*	1.000													
DRKFT1	.249*	.275*	.119*	-.212*	-.265*	-.396*	-.525*	1.000												
DEVT1	.510*	.443*	-.012	-.397*	-.302*	-.065	-.258*	.291*	1.000											
Q-FT1	.446*	.362*	.071	-.334*	-.323*	-.382*	-.450*	.590*	.481*	1.000										
LAWT2	.601*	.406*	.002	-.264*	-.231*	.014	-.193*	.090*	.408*	.270*	1.000									
INDEPT2	.429*	.533*	-.020	-.285*	-.204*	-.023	-.206*	.114*	.334*	.239*	.540*	1.000								
PEERT2	.004	-.003	.592*	.197*	-.015	-.037	-.075*	.169*	.041	.172*	-.020	-.061	1.000							
HOMET2	-.321*	-.284*	.222*	.589*	.204*	.069	.087*	-.067	-.280*	-.224*	-.356*	-.347*	.308*	1.000						
RELIGT2	-.229*	-.250*	.085*	.235*	.737*	.175*	.160*	-.158*	-.257*	-.258*	-.282*	-.253*	.040	.271*	1.000					
SNPT2	-.093*	-.167*	-.035	.068	.212*	.663*	.401*	-.447*	-.049	-.370*	-.012	-.050	-.083*	.013	.170*	1.000				
SNFT2	-.177*	-.252*	.022	.075*	.160*	.187*	.515*	-.309*	-.205*	-.331*	-.227*	-.217*	-.039	.113*	.220*	.346*	1.000			
DRKFT2	.168*	.215*	.137*	-.072	-.192*	-.288*	-.477*	.639*	.202*	.474*	.090*	.131*	.139*	-.068	-.190*	-.430*	-.477*	1.000		
DEVT2	.382*	.296*	.010	-.268*	-.234*	.051	-.149*	.101*	.635*	.319*	.506*	.385*	.025	-.327*	-.269*	.062	-.204*	.111*	1.000	
Q-FT2	.354*	.352*	.080*	-.253*	-.274*	-.304*	-.418*	.473*	.385*	.715*	.287*	.284*	.134*	-.243*	-.300*	-.395*	-.427*	.541*	.354*	1.000

LAW=lawlessness; INDEP=independence from parents; PEER=peer-related self-esteem; HOME=family-related self-esteem; RELIG=religiosity; SNP=perceived parents' disapproval of drinking by respondent; SNF=perceived friends' disapproval of drinking by respondent; DRKF=perceived drinking by friends; DEV=general deviant behavior; Q-F=quantity-frequency drinking.

* $p<.05$

was small. Self-esteem (PEER and HOME) correlated poorly with either behavior. However, it appeared that family-related self-esteem (HOME) was more closely associated with general deviance and drinking than was peer-related self-esteem (PEER) for girls. Whereas, for boys, family-related self-esteem was more closely related to deviance, while peer-related self-esteem was more closely associated with drinking.

The correlation between drinking and general deviance was moderate. However, for adolescents of all four groups, the correlation between earlier deviance (DEVT1) and later drinking (Q-FT2) was relatively stronger than that between earlier drinking (Q-FT1) and later deviance (DEVT2). It is also interesting to note that the cross-sectional correlation between drinking and deviance decreased one year later for all four groups. These findings suggest that those who reported more problem behaviors may drink more alcohol later; however, increases in drinking do not necessarily make a person more deviant. Or, an individual may engage in more problem behaviors as their drinking increases. However, the magnitude of influence is smaller than the impact of deviance on drinking.

Structural equation modeling procedure was again performed to further examine the lagged relationships between variables. The model specification procedure was performed with slight difference for this model. Although all predictors were retained in the two equations that predicted later drinking and deviance regardless of their significance, only the significant predictors were added to the equations that predicted personal and environment factors for the sake of model parsimony. LM tests and Wald tests were used to search for model specification and to ascertain significant predictors for personal and environmental factors. This process was continued till an adequate model was obtained. That is, all of the significant effects were added into the model. Once satisfactory models were obtained for

Table D-4: Problem behavior model: Initial model and equality constraints

Predictors	Dependent Variables									
	LAW T2	INDEP T2	PEER T2	HOME T2	RELIG T2	SNP T2	SNF T2	DRKF T2	DEV T2	Q-F T2
AGE	x	x	x	x	x	x	x	x	x	x
MILLS	x	x	x	x	x	x	x	x	x	x
LAWT1	x	x		x					x	x
INDEPT1	x	x							x	x
PEERT1			x	x				x	x	x
HOMET1			x	x		x			x	x
RELIGT1	x	x			x	x	x		x	x
SNPT1					x	x		x	x	x
SNFT1	x					x	x	x	x	x
DRKFT1					x	x	x	x	x	x
DEVT1	x	x		x				x	x	x
Q-FT1			x			x	x	x	x	x

Note: 1. LAW = lawlessness; INDEP = independence from parents; PEER = peer-related self-esteem; HOME = family-related self-esteem; RELIG = religiosity; SNP = parents' disapproval; SNF = friends' disapproval; DRKF = friends' drinking; DEV = general deviance; Q-F = quantity-frequency drinking;
2. All but the shaded structural coefficients were tested for equivalence across the four groups.

each group, a multi-group analysis was then undertaken. Table D-4 presents the initial model and Table D-5 summarizes the results of the cross-group comparison.

Predicting Drinking

Personal factors and perceived environment significantly predicted later drinking. In general, those who were more independent from parents (INDEPT1), had higher peer-related self-esteem (PEERT1), perceived less parents' (SNPT1) and friends' disapproval (SNFT1), reported more friends' drinking (SNFT1), and reported more problem behaviors (DEVT1) increased drinking more one year later. All of these effects, except SNPT1→Q-FT2, were statistically equal for all four groups. Perceived parental disapproval (SNPT1) did not significantly predict changes in drinking for American girls, but did it for the other three groups. Age effect was not significant on changes in drinking in this model for any group.

Table D-5: Problem behavior model: Results of cross-group comparisons

US male	Dependent Variables (T2)									
Predictors	LAW	INDEP	PEER	HOME	RELIG	SNP	SNF	DRKF	DEV	Q-F
Age	-.137*	-.068*	-.023	-.040*	.043*	-.124*	.018	.048*	-.310*	.010
Mills	.030	.066	.016	-.049	-.039	.007	.036	-.059	.131*	-.013
LAWT1	.500*	.164*		-.053*					.032*	.012
INDEPT1	.065*	.385*							-.008	.043*
PEERT1			.626*	.109*				.043*	.004	.035*
HOMET1			.061*	.561*		-.041*			-.016	-.003
RELIGT1	-.043*	-.034*			.841*	.049*	.029*		-.014	-.006
SNPT1					.035*	.579*		-.010	.018	-.033*
SNFT1	-.049*					.074*	.596*	-.140*	-.044*	-.088*
DRKFT1					-.001	-.026	-.055*	.441*	-.012	.078*
DEVT1	.073*	.056*		-.075*				.062*	.488*	.063*
Q-FT1			.077*			-.062*	-.041*	.118*	.036*	.559*
R^2	.424	.327	.444	.415	.729	.493	.420	.445	.551	.532

US female	Dependent Variables (T2)									
Predictors	LAW	INDEP	PEER	HOME	RELIG	SNP	SNF	DRKF	DEV	Q-F
Age	-.147*	-.174*	-.023	-.037*	-.034	-.121*	.015	.053*	-.341*	.011
Mills	-.024	-.024	.016	-.000	-.053*	.028	.039	-.012	.109*	.004
LAWT1	.509*	.147*		-.047*					.033*	.013
INDEPT1	.073*	.382*							-.009	.049*
PEERT1			.607*	.098*				.046*	.004	.036*
HOMET1			.068*	.580*		-.045*			-.019	-.004
RELIGT1	-.047*	-.033*			.822*	.048*	.024*		-.015	-.006
SNPT1					.034*	.575*		-.011	.020	.028
SNFT1	-.062*					.086*	.572*	-.182*	-.057*	-.112*
DRKFT1					-.001	-.022	-.144*	.413*	-.011	.072*
DEVT1	.069*	.047*		-.061*				.060*	.476*	.060*
Q-FT1			.068*			-.055*	-.031*	.116*	.035*	.536*
R^2	.428	.317	.411	.426	.693	.481	.466	.437	.546	.489

Note: 1. LAW = lawlessness; INDEP = independence from parents; PEER = peer-related self-esteem; HOME = family-related self-esteem; RELIG = religiosity; SNP = parents' disapproval; SNF = friends' disapproval; DRKF = friends' drinking; DEV = general deviance; Q-F = quantity-frequency drinking;

2. Numbers in the cells are standardized regression coefficients (β). Please see Table D-5 in Appendix C for non-standardized coefficient (b) and standard error for each coefficient.
3. Underlined coefficients were statistically not equal for the four groups.
4. * $p < .05$.

Table D-5: (continued)

Irish male	Dependent Variables (T2)									
Predictors	LAW	INDEP	PEER	HOME	RELIG	SNP	SNF	DRKF	DEV	Q-F
Age	-.078*	-.086*	-.031	-.060*	.057*	-.153*	.046	.249*	-.165*	.013
Mills	.162*	.034	-.006	-.017	.028	.111*	.066	-.036	.238*	.015
LAWT1	.493*	.164*		-.063*					.036*	.012
INDEPT1	.063*	.382*							-.009	.042*
PEERT1			.627*	.122*				.051*	.004	.032*
HOMET1			.064*	.429*		-.039*			-.017	-.003
RELIGT1	-.041*	-.033*			.744*	.045*	.056*		-.015	-.005
SNPT1					-.067*	.503*		-.014	.023	-.036*
SNFT1	-.029*					.043*	.414*	-.104*	-.029*	-.051*
DRKFT1					-.073*	-.022	-.101*	.338*	-.012	.068*
DEVT1	.069*	.054*		-.085*				.073*	.526*	.059*
Q-FT1			.080*			-.059*	-.083*	.144*	.040*	.537*
R^2	.426	.295	.439	.286	.556	.531	.266	.505	.521	.463

Irish female	Dependent Variables (T2)									
Predictors	LAW	INDEP	PEER	HOME	RELIG	SNP	SNF	DRKF	DEV	Q-F
Age	-.178*	-.080*	-.028	.072*	.052*	-.135*	.026	.204*	-.169*	.012
Mills	.057	.038	.026	.053	.020	.069*	.066*	-.078*	.128*	-.080*
LAWT1	.493*	.147*		-.048*					.036*	.011
INDEPT1	.074*	.399*							-.010	.045*
PEERT1			.597*	.103*				.045*	.005	.033*
HOMET1			.065*	.516*		-.040*			-.021	-.003
RELIGT1	-.045*	-.033*			.725*	.043*	.034*		-.016	-.006
SNPT1					.039*	.476*		.090*	.025	-.037*
SNFT1	-.049*					.062*	.450*	-.139*	-.050*	-.081*
DRKFT1					-.001	-.127*	-.063*	.436*	-.013	.072*
DEVT1	.072*	.050*		-.067*				-.005	.545*	.057*
Q-FT1			.160*			-.056*	-.051*	.127*	.044*	.554*
R^2	.428	.296	.408	.363	.533	.507	.270	.509	.469	.523

Note: 1. LAW = lawlessness; INDEP = independence from parents; PEER = peer-related self-esteem; HOME = family-related self-esteem; RELIG = religiosity; SNP = parents' disapproval; SNF = friends' disapproval; DRKF = friends' drinking; DEV = general deviance; Q-F = quantity-frequency drinking;

2. Numbers in the cells are standardized regression coefficients (β). Please see Table D-5 in Appendix C for non-standardized coefficient (b) and standard error for each coefficient.
3. Underlined coefficients were statistically not equal for the four groups.
4. * $p < .05$.

Personal Factors and Perceived Environment

Drinking also had reciprocal impacts on personal factors and perceived social environment. Drinking positively affected changes in peer-related self-esteem (PEERT2) for all subjects. That is, those who drank more alcohol at T1 increased more in peer-related self-esteem later. This effect was, however, greatest for Irish girls. For all four groups, increases in drinking also weakened the perceived disapproval by either parents (SNPT2) or friends (SNFT2). Finally, increases in drinking also increased perceived friends' drinking (DRKFT2). The impacts of drinking on social influence variables in this model were similar to the findings in the social learning model. However, drinking did not significantly predicted changes in perceived friends' disapproval in the social learning model. This effect was significant in the problem behavior model.

Some findings regarding the stability in personal factors and perceived social environment are noteworthy. Adolescents in the four groups were equal in the stability of lawlessness, independence, and peer-related self-esteem, but differed in family-related self-esteem. The two American gender groups and Irish girls were more stable on the family-related self-esteem than were Irish boys. More interestingly, religiosity was found more stable in the American sample than in the Irish sample. This finding may reflect the decreasing influence of the Catholic Church in Ireland. Perceived parents' and friends' disapproval of drinking were more stable in the American sample than in the Irish sample. The two American groups and Irish girls were more stable on perceived friends' drinking than were Irish boys.

Problem Behaviors

The results for predicting changes in problem behaviors may have been affected by

the drinking specificity of the environmental variables. In general, those who were less law-abiding (LAWT1), reported friends drinking more often (DRKFT1) and drank more (Q-FT1) in the prior year reported more problem behaviors later. These cross-lagged effects were statistically equal for the four groups. Age effect was also significant in predicting changes in problem behavior. It was found that, for all four groups, older adolescents reported a smaller increase in problem behaviors than did younger adolescents. This age effect was greater for the Irish sample than for the American sample. No significant gender difference in changes in problem behaviors was found within each sample.

General deviance also in turn affected personal factors and perceived environment. Those who reported more problem behaviors in the prior year increased more in lawlessness (LAWT2), independence from parents (INDEPT2), but decreased more in family-related self-esteem (HOMET2) one year later. The four groups were equal in these cross-lagged effects. Moreover, those who reported more deviant behaviors also reported more drinking by friends (DRKFT2) in the two American groups and Irish boys, but not in Irish girls. That is, problem behaviors were not significantly related to changes in perceived friends' drinking for Irish girls.

E. A Reformulated Social Learning Model

The utility of the major concepts from each theoretical model in predicting drinking was mostly confirmed. Alcohol expectancies and values, social influence variables and problem behavior variables all significantly predicted drinking in their own specific model. The reciprocal relationship from drinking was also confirmed for most of the variables in the models. Drinking subsequently modifies beliefs about drinking, affects personal factors and changes the perception of one's social environment.

Yet, some major concepts failed to predict changes in drinking. The major concepts in these theoretical models that did not significantly predict later drinking were "perceived behavior control" in the planned behavior model and unconventionality and religiosity in the problem behavior model. However, unconventionality did significantly predict changes in general deviance, which was found closely associated with drinking. Therefore, unconventionality may indirectly affect changes in drinking via general deviance.

The analyses also distinguished the differential effects of the elements in some major concepts in predicting drinking. For example, effect of negative values was not significant in any model that included attitudes. Moreover, its associations with other variables were very limited. These findings suggest that the utility of negative values in predicting drinking for these adolescents may be minimal. In addition, perceived parents' disapproval was not significant in either the social learning model or planned behavior model, but it was significant in the problem behavior model for three out of four groups. These findings suggest that influence of parents' disapproval may be significant, but small. Finally, the family-related self-esteem did not predict changes in drinking for any group, but it did significantly predict changes in general deviance for all of the four groups. Again, family-

related self-esteem may indirectly affect later drinking through its association with other variables.

The reformulated social learning model proposed here was constructed based on Bandura's (1977, 1986) social learning model and the findings from the four models discussed in this chapter. Only the significant predictors from each model were included in this reformulated social learning model. In addition, availability of alcohol was added into the model because the existing studies showed that perceived availability of alcohol is significantly associated with high level of drinking by adolescents (e.g., Jones-Webb, Toomey, Short, Murray, Wagenaar, & Wolfson, 1997; Morgan & Grube, 1994b; Smart, 1979). That is, drinking increases when alcohol is perceived as more available. Availability of alcohol, to some extent, is also closely related to the concept of behavioral control for adolescents who intend to use alcohol.

This model hypothesizes that drinking is a function of the interaction of an individual's personality, attitudes toward drinking, perceived social environment and drinking. Personality measures included orientations of lawlessness and independence and peer-related self-esteem. Attitudes contained three components: positive expectancies, negative expectancies and positive values. Perceived social environment included perceived parents' and friends' disapproval of drinking, perceived parents' and friends' modeling of drinking, and perceived availability of alcohol. Other variables included in the model were age, earlier drinking, deviant behavior and the inverse Mills ratio.

Availability of alcohol. The respondent was asked to evaluate on a 8-point scale (very easy--very difficult) indicating how easy or difficult for them to obtain alcoholic beverage. The question was asked specifically for each kind of alcoholic beverages.

Measures of availability for beer, wine, wine cooler and liquor (spirits) were first examined using a 2 (sample) by 2 (gender) multivariate analysis of variance (MANOVA), adjusting for age. Because cider was only measured at the Irish site, it was separately analyzed for the Irish sample using analysis of variance. The results are summarized in Table E-1. In the Irish sample, boys generally perceived every alcoholic beverage as more available to them than girls did. However, boys than girls in the American sample perceived wine cooler and liquor as more available. In contrast, there was no difference in the perceived availability of beer and wine for the two genders in the American sample. As is expected, wine cooler was more available to the American sample than to the Irish sample. Hard liquor or spirits,

Table E-1: Analyses of covariance and age-adjusted means for availability of alcohol

Item and effect	F	d.f.	p	Age-adjusted Means
Beer				
Sample	.18	1,3929	.673	US boys=4.51
Gender	6.23	1,3929	.013	US girls=4.51
Age (β = .25)	219.30	1,3929	.000	Irish boys=4.59
Sample x gender	7.72	1,3929	.005	Irish girls=4.45
Wine				
Sample	.50	1,3929	.481	US boys=4.50
Gender	9.77	1,3929	.002	US girls=4.49
Age (β = .24)	204.20	1,3929	.000	Irish boys=4.56
Sample x gender	8.02	1,3929	.005	Irish girls=4.40
Wine cooler				
Sample	11.08	1,3929	.001	US boys=4.45
Gender	3.13	1,3929	.077	US girls=4.47
Age (β = .27)	263.16	1,3929	.000	Irish boys=4.42
Sample x gender	6.19	1,3929	.013	Irish girls=4.30
Liquor (spirits)				
Sample	8.44	1,3929	.001	US boys=4.34
Gender	9.36	1,3929	.002	US girls=4.30
Age (β = .25)	222.81	1,3929	.000	Irish boys=4.49
Sample x gender				Irish girls=4.34
Cider				
Gender	6.71	1,2070	.001	Irish boys=4.48
Age (β = .33)	261.61	1,2070	.000	Irish girls=4.38

however, was more available to the Irish sample than to the American sample. And finally, older adolescents viewed alcohol, overall, more available than younger adolescents did.

These alcohol-specific availability measures were then subjected to one principal axis factor analysis with oblique rotations to obtain a score to represent availability of alcohol in the data analyses. The factor analyses suggested that a single factor could adequately represent these measures. Standardized Bartlett factor scores were calculated to represent availability of alcohol. Table E-2 presents the results of the factor analysis for availability.

Table E-2: Factor pattern matrix for availability of alcohol

US			IRISH		
Beverage	1992	1993	Beverage	1992	1993
Beer	.92	.93	Beer	.92	.89
Wine	.93	.94	Wine	.93	.92
Wine cooler	.88	.92	Wine cooler	.89	.85
Liquor	.84	.86	Spirits	.92	.91
			Cider	.90	.88
% variance explained	79%	83%	% variance explained	83%	80%

Simultaneous structural equation analyses were used to estimate the initial model. Separate structural equation modeling was first estimated for the four groups. For the sake of model parsimony, effects of exogenous variables were added to the model only if these effects were significant and consistent with prior analyses. All baseline variables were allowed to covary freely with one another. The covariance between the residuals of all dependent variables was added into the model only when it was significantly different from 0. LM tests were used to ascertain what effects should be added to the model to improve fit of model. Wald tests were used to ascertain what effects could be dropped from the model. This process was continued until all the significant effects were added into the model and the

non-significant effects were dropped from the model. Multi-group comparisons were then undertaken. The initial models contained all possible cross-lagged effects found in the four separate models and assumed all of these effects were equal for the four groups. LM tests were used to evaluate the equivalence of each path coefficient across the four groups. Table E-3 presents the initial model and Table E-4 summarizes the results of the cross-group comparisons.

Predicting Drinking

The final model fit the data well, [$\chi^2_{(712)} = 767.78$, $p = .07$, Bentler-Bonnet Normed Fit Index = .980 and Comparative Fit Index = .998]. The results generally supported the hypothesis that personality, attitudes, and perceived social environment significantly predict drinking. The results also showed that adolescents in the four groups were equally stable in their drinking. In addition, each of the cross-lagged effects that significantly predicted changes in drinking was statistically equal for the four groups, after controlling for all other effects.

However, not every effect in this model was significant. In the domain of personality, independent from parental authority (INDEPT1) was significantly and positively related to changes in drinking. That is, greater increases in drinking were related to a more independent personality trait. Orientation toward lawlessness (LAWT1) and peer-related self-esteem (PEERT1), which were significant in the problem behavior model, did not predict changes in drinking in this model, after controlling for all other effects.

Consistently, positive and negative expectancies (POSET1 and NEGET1) significantly predicted changes in drinking. However, positive values (POSVT1), which was significant in the social learning model, became not significant in this model. In general, those who

Table E-3: A reformulated social learning model: Initial model and equality constraints

	Dependent variables												
Predictors	LAW T2	INDEP T2	PEER T2	POSE T2	NEGE T2	POSV T2	SNP T2	SNF T2	DRKP T2	DRKF T2	AVAIL T2	DEV T2	Q-F T2
AGE	x	x	x	x	x	x	x	x	x	x	x	x	x
MILLS	x	x	x	x	x	x	x	x	x	x	x	x	x
LAWT1	x	x	x			x			x				
INDEPT1	x	x											x
PEERT1			x		x	x			x	x	x		
POSET1	x			x	x	x	x				x	x	x
NEGET1			x		x	x		x					x
POSVT1				x	x	x		x		x	x		
SNPT1					x		x		x	x	x		x
SNFT1				x	x	x	x	x		x	x		
DRKPT1					x		x		x	x		x	
DRKFT1			x		x		x	x		x			x
AVAILT1				x		x			x		x		x
DEVT1	x	x							x	x		x	x
Q-FT1	x		x				x			x		x	x

Note: 1. All but the shaded path coefficients were tested for equivalence for the four groups.
2. Boxed coefficients became insignificant for all of the four groups at the end of the cross group comparison. These structural paths were subsequently dropped from the models.

Table E-4: A reformulated social learning model: results of cross-group comparison

US male	Dependent variables												
Predictor	LAW T2	INDEP T2	PEER T2	POSE T2	NEGE T2	POSV T2	SNP T2	SNF T2	DRKP T2	DRKF T2	AVAIL T2	DEV T2	Q-F T2
AGE	-.138*	-.067*	-.056*	-.061*	-.046*	-.106*	-.097*	.017	-.036*	.044	-.045	-.314*	.006
MILLS	.040	.058	-.005	.034	-.029	-.025	.021	.020	-.032	-.059	-.001	.126*	-.009
LAWT1	.499*	.165*	-.013			.012			.011				
INDEPT1	.076*	.393*											.049*
PEERT1			.636*		-.055*	-.064*			.022	.042*	.090*		
POSET1	-.002			.429*	-.046*	.036	-.028				.103*	.032*	.074*
NEGET1			-.034		.540*			.054*					-.078*
POSVT1				.174*	-.039*	.514*		-.052*		.040*			
SNPT1							.568*		-.038*	-.003			
SNFT1				-.026	.086*	-.085*	.069*	.571*		-.117*	-.063*		
DRKPT1							-.099*		.829*	.038*			
DRKFT1					-.086*		-.001	-.058*		.453*			.088*
AVAILT1				.058*		.016			.031*		.499*		.041*
DEVT1	.066*	.057*							-.031*	.052*		.501*	.049*
Q-FT1	.036*		.066*				-.060*			.092*		.043*	.541*
R^2													.529

Note: 1. Underlined coefficients are statistically not equal for the four groups.
2. Numbers in the cells are standardized regression coefficients (β). Please refer to Table E-4 in Appendix C for non-standardized coefficient (b) and standard errors for each coefficient. * $p < .05$
3. LAW = lawlessness; INDEP = independence; PEER = peer-related self-esteem; POSE = positive expectancies; NEGE = negative expectancies; POSV = positive values; SNP = parents' disapproval; SNF = friends' disapproval; DRKP = parents' drinking; DRKF = friends' drinking; AVAIL = availability of alcohol; DEV = general deviance; Q-F = quantity-frequency drinking.

Table E-4: (continued)

US female	Dependent variables												
Predictors	LAW T2	INDEP T2	PEER T2	POSE T2	NEGE T2	POSV T2	SNP T2	SNF T2	DRKP T2	DRKF T2	AVAIL T2	DEV T2	Q-F T2
AGE	-.147*	-.177*	-.057*	-.057*	-.047*	-.102*	-.096*	.014	-.035*	.047	-.044	-.347*	.007
MILLS	-.038	-.030	-.004	-.030	.042	-.079*	.056	.041	-.008	-.028	-.045	.108*	.010
LAWT1	.506*	.148*	-.013			.011			.059*				
INDEPT1	.084*	.388*											.055*
PEERT1			.621*		-.054*	-.060*			.021	.043*	.003		
POSET1	.079*			.428*	-.050*	.155*	-.029				.109*	.038*	.084*
NEGET1			-.033		.533*			.044*					-.081*
POSVT1				.171*	-.042*	.520*		-.046*		.045*			
SNPT1							.563*		-.037*	-.003			
SNFT1				-.127*	.103*	-.096*	.080*	.559*		-.147*	-.073*		
DRKPT1							-.099*		.814*	.042*			
DRKFT1					-.073*		-.001	-.144*		.410*			.079*
AVAILT1				.065*		.019			.037*		.508*		.053*
DEVT1	.062*	.048*							-.027*	.050*		.490*	.047*
Q-FT1	.034*		.059*				-.052*			.150*		.042*	.508*
R^2													.507

Note: 1. Underlined coefficients are statistically not equal for the four groups.
2. Numbers in the cells are standardized regression coefficients (β). Please refer to Table E-4 in Appendix C for non-standardized coefficient (b) and standard errors for each coefficient. * $p < .05$
3. LAW = lawlessness; INDEP = independence; PEER = peer-related self-esteem; POSE = positive expectancies; NEGE = negative expectancies; POSV = positive values; SNP = parents' disapproval; SNF = friends' disapproval; DRKP = parents' drinking; DRKF = friends' drinking; AVAIL = availability of alcohol; DEV = general deviance; Q-F = quantity-frequency drinking.

perceived positive consequences as more likely and negative consequences as less likely later increased their drinking by a greater magnitude.

And finally, in the perceived social environment, friends' modeling of drinking (DRKFT1) and perceived availability of alcohol (AVAILT1) significantly predicted changes in drinking, whereas subjective norms (SNPT1 and SNFT1) and parental modeling of drinking (DRKPT1) did not. Thus, those who perceived friends drank more often and alcohol was more available increased their drinking more in the following year.

In general, independence from parental authority, anticipation of alcohol effects, perceived friends' drinking, and perceived availability of alcohol significantly contributed to increases in drinking for adolescents of this age group. Adolescent problem behaviors were also found to be associated with drinking. Those who reported more problem behaviors in the prior year increased their drinking more in the following year. The impacts of these factors on changes in drinking appeared equal for adolescents in different countries and of different genders. Independence, positive expectancies, negative expectancies, perceived friends' drinking and perceived availability of alcohol thus appear to be robust in explaining the variance in changes in drinking for adolescents of this age group and in different socio-cultural contexts.

Reciprocal Effects of Alcohol

The results showed that increases in lawlessness (LAWT2) were greater when prior drinking was higher. However, increases in peer-related self-esteem (PEERT2) were greater when prior drinking was higher. Those who drank more in the prior year also decreased more in perceived parents' disapproval (SNPT2), increased more in perceived friends' drinking (DRKFT2), and increased more in reported problem behaviors (DEVT2) in the

following year. All of these cross-lagged effects except Q-FT1→DRKFT2 were statistically equal for the four groups. Drinking had a greater impact on the perceived drinking by friends for American girls than for the other three groups.

Some effects of drinking observed in the prior models were either not found or changed in this model. First, changes in alcohol expectancies and values were significantly affected by drinking in the alcohol expectancy and value model and in the social learning model. These effects were not found in this model. Second, the effect of drinking on changes in perceived friends' drinking was statistically equal for the four groups in the social learning model. This effect was greater for American girls in the present model. Third, drinking did not affect changes in the orientation of lawlessness in the problem behavior model. Its impact on changes in the orientation of lawlessness became significant in this model and was statistically equal for the four groups. Fourth, the significant effect of drinking on the perceived friends' disapproval in the problem behavior model was not found in this model. However, this result was in line with the findings in the prior social learning model. Fifth, the impact of drinking on changes in peer-related self-esteem, which was not statistically equal for the four groups, was equal in this model.

Age Effect

Overall, changes in personality traits were greater among younger adolescents than among older adolescents. However, differences in changes in personality among the four groups were observed. First, a smaller age effect on the orientation of lawlessness was found for Irish boys. That is, increases in lawlessness were greater for younger adolescents, particularly younger Irish boys. Second, a greater age effect on independence from parental authority was found for American girls. Thus, increases in independence were greater for

younger adolescents, particularly younger American girls. Lastly, age effect on peer-related self-esteem was not significant for Irish boys. Thus, increases in peer-related self-esteem were also greater for younger adolescents in the American sample and for Irish girls, whereas this age effect was not significant for Irish boys.

Changes in positive expectancies and positive values were statistically equal for adolescents of all ages after controlling for all other effects. In addition, neither sample nor gender difference in these two aspects was significant. However, overall, decreases in negative expectancies were greater for younger adolescents than for older adolescents in all four groups. This effect was greater for Irish girls than for the other three groups.

Changes in perceived social environment also changed with age. Adolescents of all ages in the four groups did not differ in decreases in perceived friends' disapproval, whereas decreases in perceived parental disapproval were greater for younger adolescents, particularly younger Irish adolescents. The age effect on modeling of drinking was also different for the four groups. In general, increases in perceived parental drinking were greater for younger adolescents. This age difference, however, was not significant for Irish boys. As regards friends' drinking, no significant age effect was found for the two American groups, whereas a positive age effect was found for the two Irish groups. That is, older Irish adolescents reported a greater increases of drinking by friends than did younger Irish adolescents. Similarly, a significant and positive age effect on availability of alcohol was found only for the Irish sample. Moreover, this age effect was greater for Irish boys. That is, increases in perceived availability of alcohol were greater for older Irish adolescents, particularly older Irish boys, than for younger adolescents. The distinctive age effects on perceived friends' drinking and availability of alcohol observed in the Irish sample may be

because of a lower legal drinking age in Ireland.

As regards behavior, the age effect on changes in drinking was not significant, whereas it was significant on changes in general deviance for the four groups. Moreover, age had a greater impact on changes in general deviance for boys than for girls. Therefore, when all other effects were controlled, boys and girls of all ages and of two samples did not differ from each other in changes in drinking. However, younger adolescents in the two samples reported greater increases in general deviance than did older adolescents. Moreover, the age difference in general deviance was greater for boys than for girls.

Differences between Models

Although changes in drinking for the four groups were predicted by the same variables and these effects were equal for the four groups. However, it appeared that the interactive processes underlying adolescent drinking were different for the four groups. Table E-5 presents the similarities and differences in the interactive processes that affected changes in drinking for boys and girls in the two samples. The shaded coefficients indicate the differences among the four groups as a result of LM tests. In other words, the interactive processes underlying drinking for adolescents in these four groups differed in the shaded structural paths and were similar in those structural paths that are not shaded. Table E-6 further illustrates how the four groups differed in each of these structural paths. In summary, factors that immediately predicted changes in drinking for adolescents in the two samples were robust in their predictive power; many differences, however, were found in the interactive processes underlying drinking. More similarities were found between boys and girls in the American sample than in the Irish sample. The model for Irish girl appeared to be the most different among the four models.

Table E-5: A reformulated social learning model: Similarities and differences among the four groups

	Dependent variables												
Predictors	LAW T2	INDEP T2	PEER T2	POSE T2	NEGE T2	POSV T2	SNP T2	SNF T2	DRKP T2	DRKF T2	AVAIL T2	DEV T2	Q-F T2
AGE	x	x	x	x	x	x	x	x	x	x	x	x	x
LAWT1	x	x	x			x			x				
INDEPT1	x	x											x
PEERT1			x		x	x			x	x	x		
POSET1	x			x	x	x	x				x	x	x
NEGET1			x		x			x					x
POSVT1				x	x	x		x		x			
SNPT1							x		x	x			
SNFT1				x	x	x	x	x		x	x		
DRKPT1							x		x	x			
DRKFT1					x		x	x		x			x
AVAILT1				x		x			x		x		x
DEVT1	x	x							x	x		x	x
Q-FT1	x		x				x			x		x	x

Note: Shaded coefficients were not equal for the four groups.

Table E-6: A reformulated social learning model: Group differences

Difference	Illustration
Age→LAWT2	[USM = USF = IRF] > IRM
Age→INDEPT2	[USM = IRM = IRF] < USF
Age→PEERT2	[USM = USF = IRF] > IRM
Age→NEGET2	[USM = USF = IRM] < IRF
Age→SNPT2	[USM = USF] < [IRM = IRF]
Age→DRKPT2*	[USM = USF = IRF] ≠ IRM
Age→DRKFT2	[USM = USF] < [IRM = IRF]
Age→AVAILT2	[USM = USF] < IRM < IRF
Age→DEVT2	[USM = USF] > [IRM = IRF]
LAWT1→PEERT2	IRM only
LAWT1→POSVT2	IRM only
LAWT1→DRKPT2	USF only
PEERT1→NEGET2	[USM = USF = IRM], IRF = not significant
PEERT1→POSVT2	[USM = USF = IRM], IRF = not significant
PEERT1→DRKPT2	IRF only
PEERT1→AVAILT2	[USM = IRM = IRF], USF = not significant
POSET1→LAWT2	USF only
POSET1→POSVT2	[USF = IRF], not significant for boys
POSET1→SNPT2	IRF only
POSET1→AVAILT2	[USM = USF = IRF], IRM = not significant
NEGET1→PEERT2	IRF only
NEGET1→NEGET2	[USM = USF = IRM] > IRF
POSVT1→POSET2	[USM = USF] > [IRM = IRF]
POSVT1→SNFT2	[USM = USF = IRM] < IRF
SNPT1→SNPT2	[USM = USF] > [IRM = IRF]
SNPT1→DRKFT2	[USM = IRM = IRF] < USF
SNFT1→POSET2	USF only
SNFT1→POSVT2	[USM = USF = IRM], IRF = not significant
SNFT1→SNFT2	[USM = USF] > [IRM = IRF]
DRKPT1→DRKPT2	[USM = USF] > [IRM = IRF]
DRKFT1→SNPT2	IRF only
DRKFT1→SNFT2	[USM = IRM = IRF] < USF
DRKFT1→DRKFT2	[USM = USF = IRF] > IRM
AVAILT1→POSVT2	IRM only
AVAILT1→DRKPT2*	[USM = USF = IRF] ≠ IRM
AVAILT1→AVAILT2	[USM = IRM = IRF] > USF
DEVT1→DRKPT2	[USM = USF = IRM], IRF = not significant
DEVT1→DRKFT2	[USM = USF = IRM], IRF = not significant
Q-FT1→DRKFT2	[USM = IRM = IRF] < USF

Note: USM = US boys; USF = US girls; IRM = Irish boys; IRF = Irish girls.
* Direction of the relationship is opposite.

The differences in the structural paths of Age→SNPT2, Age→DRKFT2, Age→DEVT2, POSVT1→POSET2, and in the stability of perceived parental disapproval, perceived friends disapproval and perceived drinking by parents can be considered as sample differences because no gender but sample differences were found in these relationships. Differences in other structural paths reflect either gender differences within each culture or differential gender differences between the two cultures. However, differential gender differences can also be considered as expressions of cultural influence on gender roles within each society. For example, positive expectancies (POSET1) significantly affected changes in perceived parental disapproval (SNPT2) only for Irish girls. That is, for Irish girls, when positive expectancies were more likely, increases in perceived parental disapproval were greater. This effect was not significant for other groups. This finding may reflect a more conservative attitude held by the Irish parents regarding drinking by their young daughters.

Finally, the reformulated model was re-estimated without the inverse Mills ratio in the model. This procedure was to examine how biased the model estimation could be if the selection bias was not adjusted. Table E-7 summarizes the results of this procedure. The fit of model, [$\chi^2_{(764)} = 958.46$, $p < .001$, Bentler-Bonnet Normed Fit Index = .974 and Comparative Fit Index = .995], was not as good as the model with the inverse Mills ratio. The results showed that although dropping the inverse Mills ratio from the model did not changes the significance of the variables that predicted changes in drinking, some significant differences in the interactive processes were observed. The differences centered on the effects of age and negative expectancies. The prediction of positive values may be mostly affected if the inverse Mills ratio were not included in the model to adjust for selection bias.

Table E-7: A reformulated social learning model: with vs. without the inverse Mills ratio

Predictors	Dependent variables												
	LAW T2	INDEP T2	PEER T2	POSE T2	NEGE T2	POSV T2	SNP T2	SNF T2	DRKP T2	DRKF T2	AVAIL T2	DEV T2	Q-F T2
AGE	x	x	x	x	x	x	x	x	x	x	x	x	x
LAWT1	x	x	x			x			x				
INDEPT1	x	x											x
PEERT1			x		x	x			x	x	x		
POSET1	x			x	x	x	x				x	x	x
NEGET1			x		x	x		x					x
POSVT1				x	x	x		x		x	x		
SNPT1							x		x	x	x		
SNFT1				x	x	x	x	x		x	x		
DRKPT1							x		x	x			
DRKFT1					x		x	x		x			x
AVAILT1				x		x			x		x		x
DEVT1	x	x							x	x		x	x
Q-FT1	x		x				x			x		x	x

Note: 1. The shaded coefficients indicate that the results for these coefficients were different in the model without the Mills ratio.
2. The boxed coefficient was not significant for any group in the model with the Mills ratio and later dropped from the model. This boxed coefficient was significant for Irish boys in the model without the inverse Mills ratio.

Chapter 7: Summary and Conclusion

Alcohol is a legal and popular beverage in most countries. While most countries have enforced a minimum drinking age and many other rules to regulate drinking by young people, most young people have tried alcohol long before they reach the legal drinking age. Adolescent drinking has been widely studies in the United States. Many theories have been developed to understand this behavior in the American context. The present study, attempting to provide a better understanding of the social processes underlying adolescent drinking, first examined adolescent drinking using four widely-used behavior theories: social learning theory, alcohol expectancy theory, planned behavior theory and problem behavior theory. Finally, a reformulated social learning model was constructed by integrating the findings from these four models. Adolescent drinking and its association with adolescent problem behaviors were examined again using this reformulated social learning model. In addition, using the multi-national and longitudinal data, this study also assessed the cultural generalizability of these central concepts in understanding adolescent drinking.

As is expected, Irish adolescents and American adolescents differed in their alcohol use in terms of prevalence, frequency and quantity. Although the Irish sample, on average, was one-year younger than the American sample, more Irish adolescents reported lifetime and yearly alcohol use in 1992. In addition, more Irish adolescents were current drinkers.

On average, Irish adolescent drinkers did not drink as much as American adolescent drinkers did per typical drinking occasion. In particular, American boys drank more than American girls or Irish adolescents. However, more Irish adolescents reported feeling drunk and engaging in excessive drinking (i.e., 5 or more drinks in a row) in the 30 days prior to the

survey. Irish drinkers also drank more often than did American drinkers. These findings suggest a bipolar drinking pattern in the Irish sample. That is, while many Irish did not drink much, if at all, those who engaged in drinking drank more and more often. It is thus possible that the differences between the two samples can be largely attributed to the heavier drinking practices in the Irish sample, particularly among Irish boys.

Not surprisingly, the models discussed in the present study consistently showed that earlier drinking was the major predictor of later drinking. Similarly, all other variables in the models were the major predictors of themselves. These findings indicate that beliefs of and attitudes toward drinking, perceived social environment (or social influence) and behaviors (including drinking and other deviant behaviors) are all relatively stable for adolescents of this age group.

However, the four groups were similar on the stability of some variables and differed from each other on the stability of some other variables. Thus, for example, the four groups were equally stable on personal factors (lawlessness, independence, and peer-related self-esteem), positive expectancies, positive values, general deviance and Q-F drinking. However, they differed on the stability of negative expectancies (least stable for Irish girls), perceived parents' disapproval (US > Irish), perceived friends' disapproval (US > Irish), perceived parents' drinking (US > Irish), perceived friends' drinking (least stable for Irish boys) and availability of alcohol (least stable for US girls).

Although being stable, adolescent drinking was influenced by many personal and social factors. The alcohol expectancy and value model and the social learning model both confirmed the predictive power of positive alcohol expectancies, negative alcohol expectancies and positive values in predicting changes in drinking. Negative values had a

minimal impact on changes in drinking for young people of this age group. However, when personality traits, availability of alcohol and deviant behaviors were included in the model, the effect of positive values became not significant. Therefore, effects of positive expectancies and negative expectancies appeared to be consistent and important in predicting adolescent drinking. In general, those who perceived positive consequences as more likely and negative consequences as less likely increased their drinking more than did other young people.

In the social learning model, perceived parental disapproval was a significant predictor of changes in drinking, whereas perceived friends' disapproval was not. However, both of perceived parental disapproval and friends' disapproval were significant predictor of changes in drinking in the problem behavior model. Nevertheless, these two subjective norm variables did not significantly predicted changes in drinking in the reformulated model.

As regards modeling of drinking, only friends' drinking was significant in predicting changes in drinking. Parental drinking was not a significant predictor of changes in drinking. These results supported one of the hypotheses in the problem behavior model, i.e., friends', not parental, modeling of drinking significantly affects adolescent drinking. The significant effect of peer modeling also supported the argument about the relative importance of parental and peer influences and channel of influence (e.g., Biddle et al., 1980). In particular, for young people of this age group, peer influence on drinking is more important than parental influence. Moreover, peer influence is more through behavior modeling than norms. However, as was suggested by Kandel (1996), parents may have their influence through children's selection of friends. In the present study, those who reported parents drinking more often in the prior year reported friends drinking more often one year later, suggesting

that parents' drinking practices may have some impact on adolescents' association with friends.

However, the fact that parental disapproval failed to predict changes in adolescent drinking is also possible because parental norms contradict with perceived parental drinking. This study showed that while most adolescents reported that parents would disapprove their drinking, they also reported that most of their parents drank alcohol ($r = -.19$ to $-.31$). On the contrary, perceived friends' disapproval is more consistent with perceived friends' drinking. That is, most adolescents reported that friends would not disapprove their drinking, they also reported that friends drank ($r = -.29$ to $-.58$).

Subjective norms thus did not have a significant contribution to changes in drinking. Nevertheless, this finding is not in contradiction with the social learning literature, but suggests that some variables were more relevant to changes in drinking for young people of this age group. Subjective norms, in the reformulated social learning model, were significantly associated with alcohol expectancies and values (or attitudes), perceived modeling of drinking and availability of alcohol. Therefore, its impact on later drinking may be mediated through other factors. Still, the results showed that the association between perceived parental disapproval and other variables was small, indicating that perceived friends' norms were more closely related to adolescent drinking than were parental norms.

The impacts of independence and an orientation of general deviance suggested by the problem behavior theory were also significantly related to changes in drinking for young people in both Ireland and the United States. However, religiosity, which is suggested by the problem behavior theory to be an important mechanism of social control, was not significantly related to changes in either general deviance or drinking for these adolescents.

It is especially surprising to find an insignificant relationship between religion and problem behaviors for the Irish sample. Ireland is a predominantly Catholic country and traditionally the Catholic Church has been an important influence on people's life. The insignificant effect of religion found in the present study may reflect the decreasing influence of the Catholic Church in the Irish society. In fact, Irish adolescents, particularly boys, reported that religion was less important and were less favorable toward it than were American adolescents.

The relationships between drinking and personality traits are rather interesting. It seems that adolescents have distinguished the minimum drinking age law from rules at work, at school and other laws. On the one hand, the analyses of covariance showed that adolescents became more law-abiding; on the other hand, prevalence of drinking increases as adolescents became older. Moreover, lawlessness did not have a direct impact on changes in drinking. However, drinking subsequently increased the orientation of lawlessness. Similarly, peer-related self-esteem did not significantly contribute to increases of drinking, whereas drinking subsequently increased peer-related self-esteem. In contrast, although independence from parental authority significantly contributed to increases in drinking, drinking did not subsequently increase the sense of independence. Development toward independence appeared to be the most significant personal factor in predicting increases of drinking for adolescents in the two samples. Two other related findings also supported the development toward independence that characterizes adolescence: an insignificant effect of perceived parental disapproval and a very low stability in the variable of independence. The sense of independence is developing among the adolescents in this study, particularly among those younger adolescents. It is possible that as an adolescent becomes more independent, parental norms become less important.

The results, to some extent, also supported the general deviance among the heavier drinkers suggested by the problem behavior theory. Although this study did not compare casual drinkers against heavy drinkers, the results showed that increases of drinking were positively related to involvement in other deviant behaviors. That is, those who reported more deviant behaviors in the prior year increased their drinking more in the following year. Moreover, those who drank more in the prior year reported more deviant behaviors in the following year.

The variable of "perceived behavior control" in the planned behavior model did not significantly predict later drinking for these adolescents. It is possible that perceived self control of drinking as measured in this study (i.e., "cant' stop drinking/ become an alcoholic") is not relevant to most adolescents because, on average, they consumed 2-3 drinks of alcohol per drinking episode. It is also possible that wording such as "become an alcoholic" or "can't stop drinking" is not relevant to them because most adolescents have only experimented with alcohol. However, this study suggests that subjective availability of alcohol may serve as a better indicator of behavioral control for underage drinkers. That is, young people are more likely to use alcohol when alcohol is perceived as more available.

In summary, independence, alcohol expectancies, friends' modeling of drinking, perceived availability of alcohol, and general deviance appear robust in predicting changes in drinking for adolescents of this age group. Moreover, these effects appeared to be equal for adolescents in the two different countries and of two genders. Therefore, the utility of these factors for understanding youthful drinking is robust in terms of socio-cultural generalizability. However, the results also showed many sample, gender and sample by gender differences in the interactive processes underlying adolescent drinking. There were

more similarities in these processes between American boys and girls than between Irish boys and girls. The social processes underlying drinking by Irish girls appeared to be most different compared to those for American adolescents and for Irish boys.

For example, as is expected, boys and girls were not different from each other in terms of prevalence of drinking. However, overall, boys started drinking at a younger age, engaged in heavy drinking more often, felt drunk more often, and consumed more alcohol per drinking episode than girls did. Although drinking by Irish adolescents surpassed American adolescents, the expected greater gender gap was not found in this study. This suggests that gender roles in Ireland may have changed since the earlier studies (Grube & Morgan, 1986; Morgan & Grube, 1994).

Age appeared to be a very important moderating factor in almost every aspect of these interactive processes. In general, greater changes were found in younger adolescents. Moreover, it appeared that the changes were in a direction to catch up with older adolescents. It was shown that during this one-year interval, younger adolescents experienced greater increases in unconventionality, favorable attitudes toward drinking and general deviance but greater decreases in perceived social disapproval than did older adolescents. This finding is very important to the study of adolescent drinking. It indicates that personality, beliefs of or attitudes toward alcohol use, perceived social environment and even drinking are relatively stable for older adolescents. In contrast, these domains are undergoing relatively greater changes for younger adolescents.

In general, older adolescents had a higher peer-related self-esteem, had more positive expectations and fewer negative expectations about drinking, perceived less social disapproval, reported friends drinking more often and believed alcohol was more available.

All of these indicate that, gradually, the adolescent personality is developed toward more independence and such that their perceptions of the social environment evolve to resemble adult society. From the perspective of increasing peer-related self-esteem, adolescent drinking is by no means an anti-social behavior. On the contrary, it is a conforming behavior because, in adolescents' social world, parents are drinking, so are friends. Therefore, older adolescents hold attitudes that are more favorable toward drinking.

Another age effect is the impact of minimum drinking age. Although adolescents in the two samples started drinking at a similar age, number of abstainers decreased more rapidly with age in the Irish sample than in the American sample. The higher prevalence rates and more rapid increases in prevalence of drinking found in the Irish sample, particularly Irish boys, may be due to a lower minimum drinking age. In 1993, about 40% of the Irish sample could legally drink. The minimum drinking age of 18 may have made older Irish adolescents rush to drink alcohol, as it was suggested by the findings that older Irish adolescents reported that friends drank much more often and alcohol was much more available than did younger Irish adolescents in this one-year interval. However, the minimum drinking age can not adequately explain the practice of heavier drinking and more frequent intoxication observed in Irish drinkers. It is very likely that the drinking pattern observed in this Irish sample is a reflection of Irish drinking culture because it coincides with the stereotyped Irish drinking (e.g., Bales, 1962; Walsh, 1987a, b).

However, a higher minimum drinking age does not effectively deter American youth from drinking altogether. It may help those adolescents who never drink remain abstinent. However, for those who desire to drink, a higher minimum age appeared to have a very limited intervening effect. The data showed that American youth started drinking at a similar

age as Irish youth did. Empirical studies also consistently showed that persons under age 21 continued to drink alcohol, despite its illegality (e.g., Johnston, et al., 1998). It was suggested that since young people found it harder to buy alcohol, they tended to drink less in public places and more in private places. Also, underage persons often obtain alcohol through indirect sources instead of purchasing it directly through on-sale premises. Studies, however, also showed that raising age significantly ameliorated the problem of drinking and driving (Douglass, 1980; Hughes and Dodder, 1992; O'Malley & Wagenaar, 1991). Nevertheless, it is not clear whether the decreases in drinking and driving were a result of reduction in drinking or an increased recognition of the danger of driving under influence by the young people. Interestingly, the age effects on perceived availability of alcohol were greater in the Irish sample, particularly for Irish girls. In large part this may be a result of the lower minimum drinking age in Ireland.

The present study showed that beliefs and behavior of drinking are relatively stable once they are developed. In addition, greater changes are observed among younger adolescents in almost every factors in predicting changes in drinking. Given these findings, studies on younger adolescents are recommended for the design and implementation of prevention programs that target drinking by younger people before their drinking practice and beliefs of drinking are stabilized. Such studies would provide greater insights into how these beliefs and behaviors gradually developed.

Moreover, as it is shown in the literature, it appears that young people are more open to messages that target alcohol-related problem behaviors such as drinking and driving than to messages that target general underage. The failure in the latter case has been seen in the school drug education in the United States. School drug education, corresponding to a

national policy of zero tolerance of underage drinking and acknowledging the powerful peer influence on adolescent substance use, has been designed to enhance adolescents' social skills and efficacy beliefs to say "no" to drugs and their drug-using peers. However, evidence shows that school drug education either fails to deter adolescents from using alcohol or has only short-term and small effects on underage drinking (Back, 1998; Gorman, 1998). Therefore, this study suggests that prevention programs should focus on underage alcohol-related problem behaviors and risk reduction, rather than on no alcohol use. Moreover, educational or prevention programs should take into account cultural, age and gender differences in the processes underlying the development of drinking beliefs and behaviors. Thus, for example, prior drinking was more closely related to later perceived friends' drinking for American girls than for American boys or Irish adolescents. This suggests that perceptions of peer drinking may be more a result of rationalization processes for American girls. Consequently, American girls may be more affected by normative education programs that correct misperceptions of drinking.

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Appendix A

Survey Samples, Administration and Response Rates for the US Sample

School	Grade*	Wave 1			Wave 2			Wave 3		
		Eligible	Consent	Participate (%)[c]	Eligible	Consent	Participate (%)	Eligible	Consent	Participate (%)
1	9	279	229	221 (79)	246	207	184 (75)	233	194	181 (78)
2	10	328	204	189 (58)	264	164	157 (59)	243	238	176 (72)
3	12	268	180	154 (57)	288	-[d]	215 (75)	284	-	200 (70)
4	12	216	164	116 (54)	216	-	147 (68)	212	-	144 (68)
5	11	94	54	52 (55)	89	65	61 (69)	95	-	68 (72)
6	10	303	220	200 (66)	295	227	221 (75)	243	-	199 (82)
	11	245	160	153 (62)	243	-	150 (62)	292	-	244 (84)
7	12	350	227	175 (50)	386	-	279 (72)	379	-	253 (67)
8	9	186	89	76 (41)	89	49	44 (49)	80	78	71 (89)
9	10	414	214	192 (46)						
10	11	318	187	147 (46)	235	112	78 (33)	234	-	160 (68)
11	9	427	275	251 (59)	394	274	253 (64)	362	260	230 (64)
12[a]	10				13	4	4 (31)			
13[a]	10				63	30	19 (30)	44	41	15 (34)
14[b]	11				185	105	90 (49)	189	107	79 (42)

Note:

a. Some students from School 8 were transferred to School 12 and 13 due to school restructure. Also, due to small number of eligible students at School 12 and none of the Wave 2 participants were participants at Wave 1, therefore, School 12 was dropped from the survey in the third year.
b. School 14 was to replace School 9 that withdrew from the survey at Wave 2.
c. Percentages in the parentheses are response rates (= participate/eligible).
d. Schools that did not have information under "consent" were mail surveys.
*. Grade refers to the starting grade level for each school.

Appendix B

Oblique Rotated Factor Pattern for Alcohol Expectancies and Values

Item	US males, 1992			
	Factor 1	Factor 2	Factor 3	Factor 4
Positive expectancies				
Feel relaxed	-.00	-.02	-.08	.64
Feel happy	-.07	-.02	-.12	.87
Worry less	.06	.05	.19	.65
Feel outgoing	.03	-.03	.06	.70
Have fun	.06	.04	-.07	.72
Negative expectancies				
Trouble with police	.00	.05	.68	-.02
Harm health	-.07	.02	.67	-.02
Hangover	-.01	-.04	.76	-.01
Do something regretful	.03	-.01	.77	.09
Feel sick	-.00	-.06	.75	-.09
Positive values				
Feel relaxed	.80	.05	-.04	.03
Feel happy	.92	-.01	-.03	-.02
Worry less	.79	-.01	.11	.01
Feel outgoing	.79	-.01	-.02	.01
Have fun	.83	-.02	-.08	.01
Negative values				
Trouble with police	.00	.69	.08	-.03
Harm health	-.05	.70	.01	.01
Hangover	.03	.70	-.04	-.05
Do something regretful	.07	.68	-.05	.06
Feel sick	-.06	.78	-.02	.02
% variance explained	57%			

Appendix B

(continued)

Item	US males, 1993			
	Factor 1	Factor 2	Factor 3	Factor 4
Positive expectancies				
Feel relaxed	.01	-.11	-.07	.61
Feel happy	-.04	.02	-.07	.88
Worry less	.06	.04	.16	.71
Feel outgoing	.05	.01	.07	.68
Have fun	.01	.05	-.09	.78
Negative expectancies				
Trouble with police	.07	.09	.68	-.04
Harm health	-.07	.04	.69	.01
Hangover	.01	-.05	.75	-.05
Do something regretful	-.02	-.02	.75	.13
Feel sick	-.06	-.08	.77	-.07
Positive values				
Feel relaxed	.79	-.02	-.05	.05
Feel happy	.95	.02	-.05	-.08
Worry less	.82	.01	.11	-.01
Feel outgoing	.79	.00	-.01	.05
Have fun	.74	-.06	-.09	.10
Negative values				
Trouble with police	.03	.73	.08	-.05
Harm health	-.03	.77	.03	.01
Hangover	-.02	.72	-.03	.00
Do something regretful	.07	.71	-.03	.03
Feel sick	-.08	.76	-.06	.01
% variance explained	59%			

Appendix B

(continued)

Item	US females, 1992			
	Factor 1	Factor 2	Factor 3	Factor 4
Positive expectancies				
Feel relaxed	-.02	-.13	.01	.60
Feel happy	-.05	-.14	.00	.84
Worry less	.01	.14	.03	.67
Feel outgoing	.13	.09	-.03	.63
Have fun	.10	-.06	-.01	.71
Negative expectancies				
Trouble with police	-.06	.60	.04	-.02
Harm health	-.07	.57	-.01	-.04
Hangover	.00	.76	.01	-.01
Do something regretful	.06	.72	.00	.10
Feel sick	.01	.71	-.04	-.08
Positive values				
Feel relaxed	.77	-.07	.02	.09
Feel happy	.96	-.04	-.03	-.04
Worry less	.86	.08	.00	-.02
Feel outgoing	.83	-.01	.02	.02
Have fun	.84	-.05	-.01	.03
Negative values				
Trouble with police	.02	.00	.54	-.09
Harm health	.04	.01	.55	-.02
Hangover	-.06	.00	.73	.02
Do something regretful	-.00	.01	.49	.09
Feel sick	-.03	-.03	.75	.02
% variance explained	54%			

Appendix B

(continued)

Item	US females, 1993			
	Factor 1	Factor 2	Factor 3	Factor 4
Positive expectancies				
Feel relaxed	.08	-.14	-.03	.53
Feel happy	-.06	-.10	.03	.89
Worry less	.04	.13	.03	.63
Feel outgoing	.07	.07	-.07	.72
Have fun	.05	-.10	.04	.77
Negative expectancies				
Trouble with police	-.03	.64	.04	-.04
Harm health	-.06	.59	.02	-.07
Hangover	-.07	.75	-.05	.06
Do something regretful	.07	.73	.00	.10
Feel sick	.05	.74	-.03	-.12
Positive values				
Feel relaxed	.76	-.07	-.00	.09
Feel happy	.96	-.02	.02	-.06
Worry less	.87	.09	.02	-.04
Feel outgoing	.74	.00	-.02	.10
Have fun	.83	-.07	-.03	.04
Negative values				
Trouble with police	.00	.03	.61	-.04
Harm health	.04	-.02	.74	-.09
Hangover	-.02	.02	.64	.06
Do something regretful	.03	-.04	.58	.02
Feel sick	-.05	.02	.73	.06
% variance explained	56%			

Appendix B

(continued)

Item	Irish males, 1992			
	Factor 1	Factor 2	Factor 3	Factor 4
Positive expectancies				
Feel relaxed	-.01	-.26	-.05	.54
Feel happy	-.10	.00	.02	.82
Worry less	.04	.19	.02	.66
Feel outgoing	.19	.08	-.04	.53
Have fun	.13	-.06	.08	.60
Negative expectancies				
Trouble with police	-.02	.64	.11	.02
Harm health	-.08	.65	-.03	-.02
Hangover	.01	.74	-.03	.05
Do something regretful	.07	.72	.01	.02
Feel sick	-.03	.74	-.06	-.07
Positive values				
Feel relaxed	.69	-.12	.07	.07
Feel happy	.91	-.04	.01	-.06
Worry less	.63	.10	.02	.02
Feel outgoing	.72	.02	-.04	.02
Have fun	.74	-.05	-.05	.02
Negative values				
Trouble with police	.06	.03	.59	-.01
Harm health	.01	-.02	.62	-.03
Hangover	-.00	-.01	.60	.02
Do something regretful	.01	-.01	.64	-.02
Feel sick	-.09	.00	.67	.04
% variance explained	48%			

Appendix B

(continued)

Item	Irish males, 1993			
	Factor 1	Factor 2	Factor 3	Factor 4
Positive expectancies				
Feel relaxed	.01	-.16	.03	.58
Feel happy	-.07	-.04	.04	.82
Worry less	.14	.23	.02	.55
Feel outgoing	.08	.09	-.05	.65
Have fun	.07	.03	-.01	.68
Negative expectancies				
Trouble with police	.03	.72	.11	-.10
Harm health	-.06	.66	.03	-.03
Hangover	-.04	.76	-.02	.07
Do something regretful	.02	.73	.00	.09
Feel sick	-.03	.79	-.05	-.02
Positive values				
Feel relaxed	.71	-.11	.03	.08
Feel happy	.88	-.07	-.05	.02
Worry less	.72	.09	.06	-.04
Feel outgoing	.72	.06	-.03	.06
Have fun	.75	-.11	-.03	.04
Negative values				
Trouble with police	.05	.08	.63	-.07
Harm health	.06	.03	.60	-.07
Hangover	-.07	-.03	.63	.12
Do something regretful	.08	-.05	.72	-.02
Feel sick	-.14	.01	.68	.09
% variance explained	52%			

Appendix B

(continued)

Item	Irish females, 1992			
	Factor 1	Factor 2	Factor 3	Factor 4
Positive expectancies				
Feel relaxed	.03	.02	-.29	.46
Feel happy	-.07	-.04	-.06	.83
Worry less	.05	.03	.19	.58
Feel outgoing	.10	-.00	.08	.57
Have fun	.12	.06	-.05	.62
Negative expectancies				
Trouble with police	-.03	.15	.68	-.03
Harm health	-.08	.02	.63	-.03
Hangover	.01	-.03	.74	.03
Do something regretful	.07	.00	.69	.12
Feel sick	-.02	-.08	.77	-.08
Positive values				
Feel relaxed	.69	-.02	-.10	.07
Feel happy	.87	.01	-.08	-.02
Worry less	.83	.05	.10	-.07
Feel outgoing	.73	-.03	.05	.03
Have fun	.75	-.04	-.07	.07
Negative values				
Trouble with police	-.03	.70	.04	-.02
Harm health	-.04	.76	-.00	-.04
Hangover	.04	.67	-.06	.03
Do something regretful	.02	.68	.02	.04
Feel sick	.01	.74	-.01	.00
% variance explained	53%			

Appendix B

(continued)

Item	Irish females, 1993			
	Factor 1	Factor 2	Factor 3	Factor 4
Positive expectancies				
Feel relaxed	-.05	-.25	-.04	.61
Feel happy	-.05	.01	.00	.85
Worry less	.10	.19	.02	.53
Feel outgoing	.18	.13	.00	.51
Have fun	.17	.00	.09	.57
Negative expectancies				
Trouble with police	.01	.65	.14	-.05
Harm health	-.13	.59	-.05	.03
Hangover	-.02	.72	-.04	.01
Do something regretful	.11	.66	.04	.04
Feel sick	-.05	.77	-.04	-.04
Positive values				
Feel relaxed	.73	-.11	-.03	.07
Feel happy	.90	-.04	-.00	-.02
Worry less	.73	.09	.03	.02
Feel outgoing	.72	-.00	-.04	.08
Have fun	.83	-.05	-.01	-.02
Negative values				
Trouble with police	-.01	.04	.65	.00
Harm health	-.06	-.01	.68	.02
Hangover	.06	-.05	.63	-.04
Do something regretful	.01	-.04	.70	.03
Feel sick	-.04	.05	.66	.00
% variance explained	51%			

Appendix C

Non-Standardized Regression Coefficients and Standard Errors

Table A-7: Alcohol expectancy and value model

US male	Dependent Variables				
Predictors	POSET2	NEGET2	POSVT2	NEGVT2	Q-FT2
Age	-.046	-.037	-.082	-.029	-.033
	(.015)	(.016)	(.013)	(.014)	(.018)
Mills	.351	-.093	-.331	-.266	-.208
	(.278)	(.275)	(.276)	(.327)	(.277)
POSET1	.447	-.075	.078	.011	.089
	(.020)	(.017)	(.018)	(.018)	(.016)
NEGET1	-.029	.547	-.004	.025	-.103
	(.018)	(.019)	(.017)	(.017)	(.016)
POSVT1	.167	-.044	.501	-.050	.049
	(.021)	(.018)	(.020)	(.020)	(.017)
NEGVT1	.006	.036	-.003	.376	.026
	(.018)	(.016)	(.016)	(.020)	(.016)
Q-FT1	-.020	-.102	.059	.021	.604
	(.022)	(.019)	(.018)	(.019)	(.018)

Note: Standard errors are given in parentheses.

US female	Dependent Variables				
Predictors	POSET2	NEGET2	POSVT2	NEGVT2	Q-FT2
Age	-.046	-.037	-.082	-.029	-.033
	(.015)	(.016)	(.013)	(.014)	(.018)
Mills	-.392	.471	-.840	.460	-.096
	(.288)	(.283)	(.265)	(.245)	(.274)
POSET1	.447	-.075	.169	.011	.089
	(.020)	(.017)	(.026)	(.018)	(.016)
NEGET1	-.029	.547	-.004	.025	-.103
	(.018)	(.019)	(.017)	(.017)	(.016)
POSVT1	.167	-.044	.501	-.050	.049
	(.021)	(.018)	(.020)	(.020)	(.017)
NEGVT1	.006	.036	-.003	.376	.026
	(.018)	(.016)	(.016)	(.020)	(.016)
Q-FT1	.062	-.102	.059	.021	.604
	(.032)	(.019)	(.018)	(.019)	(.018)

Note: Standard errors are given in parentheses.

Table A-7: (contiuned)

Irish male	Dependent Variables				
Predictors	POSET2	NEGET2	POSVT2	NEGVT2	Q-FT2
Age	-.046	-.037	-.082	-.029	.047
	(.015)	(.016)	(.013)	(.014)	(.016)
Mills	.087	.670	.063	.163	.235
	(.235)	(.201)	(.184)	(.224)	(.206)
POSET1	.447	-.075	.078	.011	.089
	(.020)	(.017)	(.018)	(.018)	(.016)
NEGET1	-.029	.547	-.004	.025	-.103
	(.018)	(.019)	(.017)	(.017)	(.016)
POSVT1	.076	-.044	.581	-.050	.049
	(.041)	(.018)	(.032)	(.020)	(.017)
NEGVT1	.006	.036	-.003	.376	.026
	(.018)	(.016)	(.016)	(.020)	(.016)
Q-FT1	-.020	-.102	.059	.021	.604
	(.022)	(.019)	(.018)	(.019)	(.018)

Note: Standard errors are given in parentheses.

Irish female	Dependent Variables				
Predictors	POSET2	NEGET2	POSVT2	NEGVT2	Q-FT2
Age	-.046	-.134	-.082	-.029	.047
	(.015)	(.025)	(.013)	(.014)	(.016)
Mills	-.214	.185	-.313	.158	-.428
	(.230)	(.215)	(.211)	(.210)	(.186)
POSET1	.321	-.075	.078	.011	.089
	(.031)	(.017)	(.018)	(.018)	(.016)
NEGET1	-.029	.443	-.004	.025	-.103
	(.018)	(.033)	(.017)	(.017)	(.016)
POSVT1	.167	-.044	.501	.021	.049
	(.021)	(.018)	(.020)	(.031)	(.017)
NEGVT1	.006	.036	-.003	.540	.026
	(.018)	(.016)	(.016)	(.035)	(.016)
Q-FT1	-.020	-.102	.059	.021	.604
	(.022)	(.019)	(.018)	(.019)	(.018)

Note: Standard errors are given in parentheses.

Table B-5: Social learning model

US male	Dependent Variables								
Predictor	POSET2	NEGET2	POSVT2	NEGVT2	SNPT2	SNFT2	DRKPT2	DRKFT2	Q-FT2
Age	-.040	-.052	-.081	-.028	-.140	.017	-.017	.017	-.037
	(.016)	(.014)	(.014)	(.015)	(.017)	(.011)	(.008)	(.012)	(.018)
Mills	.301	-.251	-.335	-.252	-.108	.314	-.169	-.277	-.158
	(.377)	(.268)	(.274)	(.327)	(.327)	(.253)	(.147)	(.182)	(.273)
POSET1	.412	-.055	.034	.012	-.051	-.033	-.012	-.000	.070
	(.019)	(.017)	(.021)	(.018)	(.023)	(.012)	(.010)	(.010)	(.016)
NEGET1	-.014	.493	.018	.025	.042	.051	-.010	-.014	-.082
	(.019)	(.018)	(.017)	(.018)	(.021)	(.014)	(.009)	(.010)	(.017)
POSVT1	.146	-.034	.481	-.046	-.008	-.055	.008	.028	.038
	(.019)	(.018)	(.020)	(.020)	(.021)	(.014)	(.010)	(.010)	(.017)
NEGVT1	.005	.043	-.006	.377	.007	-.024	-.015	-.011	.024
	(.018)	(.016)	(.016)	(.020)	(.020)	(.014)	(.010)	(.009)	(.016)
SNPT1	-.001	.021	.003	-.015	.586	.001	-.025	.002	.003
	(.015)	(.015)	(.014)	(.014)	(.022)	(.011)	(.007)	(.009)	(.013)
SNFT1	-.094	.081	-.094	.019	.042	.519	-.004	-.077	-.053
	(.022)	(.019)	(.019)	(.019)	(.026)	(.021)	(.010)	(.011)	(.018)
DRKPT1	-.014	-.043	-.003	-.002	-.182	-.025	.808	.045	.047
	(.023)	(.022)	(.021)	(.022)	(.026)	(.017)	(.013)	(.012)	(.021)
DRKFT1	-.088	-.070	-.035	-.000	-.005	-.046	.009	.418	.110
	(.038)	(.036)	(.038)	(.034)	(.043)	(.026)	(.018)	(.020)	(.032)
Q-FT1	.004	-.057	.050	.022	-.064	-.016	-.002	.076	.557
	(.022)	(.021)	(.020)	(.021)	(.025)	(.015)	(.011)	(.011)	(.020)
US female	Dependent Variables								
Predictor	POSET2	NEGET2	POSVT2	NEGVT2	SNPT2	SNFT2	DRKPT2	DRKFT2	Q-FT2
Age	-.040	-.052	-.081	-.028	-.140	.017	-.017	.017	-.037
	(.016)	(.014)	(.014)	(.015)	(.017)	(.011)	(.008)	(.012)	(.018)
Mills	-.296	.353	-.842	.481	.429	.445	-.016	-.106	-.114
	(.283)	(.279)	(.265)	(.246)	(.342)	(.297)	(.157)	(.173)	(.271)
POSET1	.412	-.055	.146	.012	-.051	-.033	.022	.042	.070
	(.019)	(.017)	(.022)	(.018)	(.023)	(.012)	(.016)	(.016)	(.016)
NEGET1	-.014	.493	.018	.025	.042	.051	-.010	-.014	-.082
	(.019)	(.018)	(.017)	(.018)	(.021)	(.014)	(.009)	(.010)	(.017)
POSVT1	.146	-.034	.481	-.046	-.008	-.055	.008	.028	.038
	(.019)	(.018)	(.020)	(.020)	(.021)	(.014)	(.010)	(.010)	(.017)
NEGVT1	.005	.043	-.006	.377	.007	.042	-.015	-.011	.024
	(.018)	(.016)	(.016)	(.020)	(.020)	(.021)	(.010)	(.009)	(.016)
SNPT1	-.001	.021	.003	-.015	.586	.001	-.025	.002	.003
	(.015)	(.015)	(.014)	(.014)	(.022)	(.011)	(.007)	(.009)	(.013)
SNFT1	-.094	.081	-.094	.019	.042	.519	-.004	-.077	-.053
	(.022)	(.019)	(.019)	(.019)	(.026)	(.021)	(.010)	(.011)	(.018)
DRKPT1	-.014	-.043	-.003	-.002	-.182	-.025	.808	.045	.047
	(.023)	(.022)	(.021)	(.022)	(.026)	(.017)	(.013)	(.012)	(.021)
DRKFT1	.071	-.070	-.035	-.000	-.005	-.238	.009	.418	.110
	(.053)	(.036)	(.038)	(.034)	(.043)	(.054)	(.018)	(.020)	(.032)
Q-FT1	.004	-.057	.050	.022	-.064	-.016	-.002	.076	.557
	(.022)	(.021)	(.020)	(.021)	(.025)	(.015)	(.011)	(.011)	(.020)

Note: Standard errors are given in parentheses.

Table B-5: (continued)

Irish male	Dependent Variables								
Predictor	POSET2	NEGET2	POSVT2	NEGVT2	SNPT2	SNFT2	DRKPT2	DRKFT2	Q-FT2
Age	-.040	-.052	-.081	-.028	-.140	.017	-.017	.084	.032
	(.016)	(.014)	(.014)	(.015)	(.017)	(.011)	(.008)	(.010)	(.017)
Mills	.037	.669	.113	.201	.839	.211	-.042	-.061	.238
	(.236)	(.201)	(.184)	(.225)	(.234)	(.108)	(.101)	(.103)	(.206)
POSET1	.412	-.055	.034	.012	-.051	-.033	-.012	-.000	.070
	(.019)	(.017)	(.021)	(.018)	(.023)	(.012)	(.010)	(.010)	(.016)
NEGET1	-.014	.493	.018	.025	.042	.051	-.010	-.014	-.082
	(.019)	(.018)	(.017)	(.018)	(.021)	(.014)	(.009)	(.010)	(.017)
POSVT1	.146	-.034	.589	-.046	-.008	-.055	.008	.028	.038
	(.019)	(.018)	(.031)	(.020)	(.021)	(.014)	(.010)	(.010)	(.017)
NEGVT1	.005	.043	-.006	.377	.007	-.024	.034	-.011	.024
	(.018)	(.016)	(.016)	(.020)	(.020)	(.014)	(.017)	(.009)	(.016)
SNPT1	-.001	-.063	.003	-.015	.461	.001	-.025	.002	.003
	(.015)	(.027)	(.014)	(.014)	(.022)	(.011)	(.007)	(.009)	(.013)
SNFT1	-.094	.081	-.094	.019	.042	.247	-.004	-.077	-.053
	(.022)	(.019)	(.019)	(.019)	(.026)	(.027)	(.010)	(.011)	(.018)
DRKPT1	-.014	-.043	-.003	-.002	-.182	-.025	.729	.045	.047
	(.023)	(.022)	(.021)	(.022)	(.026)	(.017)	(.026)	(.012)	(.021)
DRKFT1	-.088	-.205	.083	-.000	-.005	-.046	.009	.307	.110
	(.038)	(.058)	(.051)	(.034)	(.043)	(.026)	(.018)	(.028)	(.032)
Q-FT1	.004	-.057	.050	.022	-.064	-.016	-.002	.076	.557
	(.022)	(.021)	(.020)	(.021)	(.025)	(.015)	(.011)	(.011)	(.020)
Irish female	Dependent Variables								
Predictor	POSET2	NEGET2	POSVT2	NEGVT2	SNPT2	SNFT2	DRKPT2	DRKFT2	Q-FT2
Age	-.040	-.052	-.081	-.028	-.140	.017	-.017	.084	.032
	(.016)	(.014)	(.014)	(.015)	(.017)	(.011)	(.008)	(.010)	(.017)
Mills	-.288	.347	-.342	.174	.597	.248	-.009	-.340	-.445
	(.229)	(.203)	(.210)	(.210)	(.239)	(.159)	(.101)	(.108)	(.186)
POSET1	.412	-.055	.146	.012	.080	-.033	-.012	-.000	.070
	(.019)	(.017)	(.022)	(.018)	(.035)	(.012)	(.010)	(.010)	(.016)
NEGET1	-.014	.493	.018	.025	.042	.051	-.010	-.014	-.082
	(.019)	(.018)	(.017)	(.018)	(.021)	(.014)	(.009)	(.010)	(.017)
POSVT1	.146	-.034	.481	.022	-.008	-.055	.008	.028	.038
	(.019)	(.018)	(.020)	(.031)	(.021)	(.014)	(.010)	(.010)	(.017)
NEGVT1	.005	.043	-.006	.540	.007	.042	-.015	-.011	.024
	(.018)	(.016)	(.016)	(.035)	(.020)	(.021)	(.010)	(.009)	(.016)
SNPT1	-.001	.021	.003	-.015	.461	.001	-.025	.045	.003
	(.015)	(.015)	(.014)	(.014)	(.022)	(.011)	(.007)	(.012)	(.013)
SNFT1	.049	.081	-.094	.019	.152	.356	-.004	-.077	-.053
	(.038)	(.019)	(.019)	(.019)	(.047)	(.026)	(.010)	(.011)	(.018)
DRKPT1	-.014	-.043	-.003	-.002	-.182	-.025	.808	.045	.047
	(.023)	(.022)	(.021)	(.022)	(.026)	(.017)	(.013)	(.012)	(.021)
DRKFT1	-.088	-.070	-.152	-.000	-.256	-.046	.009	.418	.110
	(.038)	(.036)	(.053)	(.034)	(.070)	(.026)	(.018)	(.020)	(.032)
Q-FT1	.004	-.057	.050	.022	-.064	-.016	-.002	.076	.557
	(.022)	(.021)	(.020)	(.021)	(.025)	(.015)	(.011)	(.011)	(.020)

Note: Standard errors are given in parentheses.

Table C-5: Planned behavior model

US male	Dependent Variables							
Predictor	POSET2	NEGET2	POSVT2	NEGVT2	SNPT2	SNFT2	CNTRLT2	Q-FT2
Age	-.040	-.038	-.080	-.057	-.108	.007	.006	-.030
	(.015)	(.015)	(.014)	(.017)	(.019)	(.010)	(.014)	(.018)
Mills	.337	-.108	-.322	-.462	-.003	.295	.373	-.184
	(.277)	(.270)	(.274)	(.334)	(.333)	(.253)	(.301)	(.275)
POSET1	.426	-.055	.063	.017	-.047	-.034	.065	.075
	(.020)	(.017)	(.019)	(.018)	(.023)	(.012)	(.018)	(.016)
NEGET1	.003	.492	.029	.010	.048	.052	-.058	-.070
	(.021)	(.020)	(.019)	(.019)	(.023)	(.015)	(.020)	(.018)
POSVT1	.167	-.031	.509	-.023	-.006	-.055	-.034	.038
	(.020)	(.018)	(.018)	(.018)	(.022)	(.014)	(.021)	(.017)
NEGVT1	.007	.039	-.004	.372	.006	-.011	-.019	.024
	(.018)	(.016)	(.016)	(.019)	(.020)	(.013)	(.017)	(.016)
SNPT1	.000	.011	.001	-.019	.620	-.002	.006	-.004
	(.015)	(.014)	(.013)	(.014)	(.022)	(.011)	(.014)	(.013)
SNFT1	-.042	.093	-.069	.014	.057	.547	-.051	-.073
	(.028)	(.018)	(.019)	(.019)	(.025)	(.020)	(.023)	(.018)
CNTRLT1	.034	-.049	.019	-.039	.043	-.002	.391	.025
	(.018)	(.017)	(.017)	(.017)	(.022)	(.014)	(.020)	(.016)
Q-FT1	-.009	-.082	.042	.046	-.088	-.031	-.003	.588
	(.020)	(.019)	(.019)	(.023)	(.023)	(.014)	(.020)	(.018)

US female	Dependent Variables							
Predictor	POSET2	NEGET2	POSVT2	NEGVT2	SNPT2	SNFT2	CNTRLT2	Q-FT2
Age	-.040	-.038	-.080	.022	-.108	.007	.006	-.030
	(.015)	(.015)	(.014)	(.023)	(.019)	(.010)	(.014)	(.018)
Mills	-.278	.448	-.819	.879	.558	.287	-.467	-.072
	(.282)	(.282)	(.264)	(.279)	(.348)	(.302)	(.317)	(.272)
POSET1	.426	-.055	.142	.017	-.047	-.034	.065	.075
	(.020)	(.017)	(.027)	(.018)	(.023)	(.012)	(.018)	(.016)
NEGET1	.003	.492	.029	.010	.048	.052	-.058	-.070
	(.021)	(.020)	(.019)	(.019)	(.023)	(.015)	(.020)	(.018)
POSVT1	.167	-.031	.509	-.023	-.006	-.055	-.034	.038
	(.020)	(.018)	(.018)	(.018)	(.022)	(.014)	(.021)	(.017)
NEGVT1	.007	.039	-.004	.372	.006	.073	-.019	.024
	(.018)	(.016)	(.016)	(.019)	(.020)	(.036)	(.017)	(.016)
SNPT1	.000	.011	.001	-.019	.620	.049	.006	-.004
	(.015)	(.014)	(.013)	(.014)	(.022)	(.025)	(.014)	(.013)
SNFT1	-.113	.093	-.069	.014	.057	.547	-.126	-.073
	(.025)	(.018)	(.019)	(.019)	(.025)	(.020)	(.028)	(.018)
CNTRLT1	.034	-.049	.019	-.039	.043	-.002	.391	.025
	(.018)	(.017)	(.017)	(.017)	(.022)	(.014)	(.020)	(.016)
Q-FT1	-.009	-.082	.042	-.034	-.088	-.031	-.003	.588
	(.020)	(.019)	(.019)	(.031)	(.023)	(.014)	(.020)	(.018)

Note: Standard errors are given in parentheses.

Table C-5: (continued)

Irish male	Dependent Variables							
Predictor	POSET2	NEGET2	POSVT2	NEGVT2	SNPT2	SNFT2	CNTRLT2	Q-FT2
Age	-.040	-.038	-.080	-.057	-.108	.007	.006	.045
	(.015)	(.015)	(.014)	(.017)	(.019)	(.010)	(.014)	(.017)
Mills	.103	.646	.100	.058	.969	.196	-.241	.239
	(.236)	(.200)	(.183)	(.230)	(.241)	(.108)	(.198)	(.206)
POSET1	.426	-.055	.063	.017	-.047	-.034	.065	.075
	(.020)	(.017)	(.019)	(.018)	(.023)	(.012)	(.018)	(.016)
NEGET1	.003	.492	.029	.010	.048	.052	-.058	-.070
	(.021)	(.020)	(.019)	(.019)	(.023)	(.015)	(.020)	(.018)
POSVT1	.058	-.031	.509	-.023	-.006	-.055	-.034	.038
	(.040)	(.018)	(.018)	(.018)	(.022)	(.014)	(.021)	(.017)
NEGVT1	.007	.039	-.004	.372	.006	-.011	-.019	.024
	(.018)	(.016)	(.016)	(.019)	(.020)	(.013)	(.017)	(.016)
SNPT1	.000	.011	.001	-.019	.474	-.002	.006	-.004
	(.015)	(.014)	(.013)	(.014)	(.022)	(.011)	(.014)	(.013)
SNFT1	-.042	.093	-.186	.014	.057	.259	-.051	-.073
	(.028)	(.018)	(.046)	(.019)	(.025)	(.027)	(.023)	(.018)
CNTRLT1	.034	-.049	.019	-.039	-.086	-.002	.391	.025
	(.018)	(.017)	(.017)	(.017)	(.044)	(.014)	(.020)	(.016)
Q-FT1	-.009	-.082	.042	.046	-.088	-.031	-.003	.588
	(.020)	(.019)	(.019)	(.023)	(.023)	(.014)	(.020)	(.018)

Irish female	Dependent Variables							
Predictor	POSET2	NEGET2	POSVT2	NEGVT2	SNPT2	SNFT2	CNTRLT2	Q-FT2
Age	-.040	-.136	-.080	-.057	-.223	.007	.006	.045
	(.015)	(.024)	(.014)	(.017)	(.029)	(.010)	(.014)	(.017)
Mills	-.251	.124	-.290	.082	.228	.287	-.472	-.399
	(.230)	(.212)	(.211)	(.213)	(.256)	(.157)	(.195)	(.186)
POSET1	.335	-.055	.063	.017	.054	-.034	.065	.075
	(.033)	(.017)	(.019)	(.018)	(.036)	(.012)	(.018)	(.016)
NEGET1	.003	.397	.029	.010	.048	.052	-.058	-.070
	(.021)	(.033)	(.019)	(.019)	(.023)	(.015)	(.020)	(.018)
POSVT1	.167	-.031	.509	-.023	-.006	-.055	.048	.038
	(.020)	(.018)	(.018)	(.018)	(.022)	(.014)	(.029)	(.017)
NEGVT1	.007	.039	-.004	.522	.006	-.011	-.019	.024
	(.018)	(.016)	(.016)	(.035)	(.020)	(.013)	(.017)	(.016)
SNPT1	.000	.011	.001	-.019	.474	-.002	.006	-.004
	(.015)	(.014)	(.013)	(.014)	(.022)	(.011)	(.014)	(.013)
SNFT1	.046	.093	-.069	.014	.191	.353	-.051	-.073
	(.039)	(.018)	(.019)	(.019)	(.045)	(.026)	(.023)	(.018)
CNTRLT1	.034	-.049	.019	-.039	.043	-.002	.237	.025
	(.018)	(.017)	(.017)	(.017)	(.022)	(.014)	(.030)	(.016)
Q-FT1	-.009	-.082	.042	.046	-.088	-.031	-.003	.588
	(.020)	(.019)	(.019)	(.023)	(.023)	(.014)	(.020)	(.018)

Note: Standard errors are given in parentheses.

Table D-5: Problem behavior model

US male	Dependent Variables (T2)									
Predictors	LAW	INDEP	PEER	HOME	RELIG	SNP	SNF	DRKF	DEV	Q-F
Age	-.100	-.052	-.011	-.020	.027	-.125	.013	.026	-.063	.009
	(.012)	(.014)	(.008)	(.009)	(.010)	(.017)	(.010)	(.012)	(.004)	(.014)
Mills	.244	.562	.085	-.272	-.273	.074	.300	-.344	.296	-.118
	(.250)	(.289)	(.165)	(.177)	(.152)	(.329)	(.257)	(.185)	(.064)	(.266)
LAWT1	.502	.175		-.037					.009	.015
	(.018)	(.022)		(.012)					(.004)	(.020)
INDEPT1	.061	.381							-.002	.047
	(.015)	(.019)							(.004)	(.016)
PEERT1			.624	.114				.047	.002	.061
			(.016)	(.016)				(.014)	(.005)	(.024)
HOMET1			.060	.572		-.083			-.006	-.005
			(.014)	(.021)		(.027)			(.005)	(.023)
RELIGT1	-.049	-.041			.839	.077	.034		-.004	-.008
	(.017)	(.020)			(.015)	(.024)	(.014)		(.004)	(.018)
SNPT1					.023	.607		-.005	.004	-.029
					(.009)	(.021)		(.008)	(.003)	(.014)
SNFT1	-.044					.093	.555	-.091	-.011	-.092
	(.013)					(.022)	(.027)	(.011)	(.004)	(.017)
DRKFT1					-.001	-.047	-.076	.425	-.004	.121
					(.018)	(.042)	(.026)	(.020)	(.006)	(.031)
DEVT1	.284	.232		-.203				.176	.535	.288
	(.069)	(.084)		(.049)				(.047)	(.017)	(.079)
Q-FT1			.044			-.074	-.037	.074	.009	.558
			(.010)			(.023)	(.014)	(.011)	(.004)	(.019)

US female	Dependent Variables (T2)									
Predictors	LAW	INDEP	PEER	HOME	RELIG	SNP	SNF	DRKF	DEV	Q-F
Age	-.100	-.143	-.011	-.020	-.023	-.125	.013	.026	-.063	.009
	(.012)	(.027)	(.008)	(.009)	(.016)	(.017)	(.010)	(.012)	(.004)	(.014)
Mills	-.189	-.229	.093	-.002	-.405	.340	.413	-.068	.238	.033
	(.236)	(.337)	(.171)	(.189)	(.183)	(.343)	(.297)	(.174)	(.060)	(.262)
LAWT1	.502	.175		-.037					.009	.015
	(.018)	(.022)		(.012)					(.004)	(.020)
INDEPT1	.061	.381							-.002	.047
	(.015)	(.019)							(.004)	(.016)
PEERT1			.624	.114				.047	.002	.061
			(.016)	(.016)				(.014)	(.005)	(.024)
HOMET1			.060	.572		-.083			-.006	-.005
			(.014)	(.021)		(.027)			(.005)	(.023)
RELIGT1	-.049	-.041			.839	.077	.034		-.004	-.008
	(.017)	(.020)			(.015)	(.024)	(.014)		(.004)	(.018)
SNPT1					.023	.607		-.005	.004	.023
					(.009)	(.021)		(.008)	(.003)	(.021)
SNFT1	-.044					.093	.540	-.091	-.011	-.092
	(.013)					(.022)	(.029)	(.011)	(.004)	(.017)
DRKFT1					-.001	-.047	-.279	.425	-.004	.121
					(.018)	(.042)	(.059)	(.020)	(.006)	(.031)
DEVT1	.284	.232		-.203				.176	.535	.288
	(.069)	(.084)		(.049)				(.047)	(.017)	(.079)
Q-FT1			.044			-.074	-.037	.074	.009	.558
			(.010)			(.023)	(.014)	(.011)	(.004)	(.019)

Note: Standard errors are given in parentheses.

Table D-5: (continued)

Irish male	Dependent Variables (T2)									
Predictors	LAW	INDEP	PEER	HOME	RELIG	SNP	SNF	DRKF	DEV	Q-F
Age	-.045	-.052	-.011	-.020	.027	-.125	.013	.083	-.023	.009
	(.019)	(.014)	(.008)	(.009)	(.010)	(.017)	(.010)	(.010)	(.003)	(.014)
Mills	.896	.197	-.020	-.054	.129	.869	.183	-.115	.325	.096
	(.197)	(.211)	(.112)	(.120)	(.139)	(.238)	(.110)	(.104)	(.042)	(.207)
LAWT1	.502	.175		-.037					.009	.015
	(.018)	(.022)		(.012)					(.004)	(.020)
INDEPT1	.061	.381							-.002	.047
	(.015)	(.019)							(.004)	(.016)
PEERT1			.624	.114				.047	.002	.061
			(.016)	(.016)				(.014)	(.005)	(.024)
HOMET1			.060	.371		-.083			-.006	-.005
			(.014)	(.028)		(.027)			(.005)	(.023)
RELIGT1	-.049	-.041			.746	.077	.034		-.004	-.008
	(.017)	(.020)			(.019)	(.024)	(.014)		(.004)	(.018)
SNPT1					-.038	.489		-.005	.004	-.029
					(.019)	(.022)		(.008)	(.003)	(.014)
SNFT1	-.044					.093	.316	-.091	-.011	-.092
	(.013)					(.022)	(.027)	(.011)	(.004)	(.017)
DRKFT1					-.092	-.047	-.076	.294	-.004	.121
					(.039)	(.042)	(.026)	(.029)	(.006)	(.031)
DEVT1	.284	.232		-.203				.176	.535	.288
	(.069)	(.084)		(.049)				(.047)	(.017)	(.079)
Q-FT1			.044			-.074	-.037	.074	.009	.558
			(.010)			(.023)	(.014)	(.011)	(.004)	(.019)

Irish female	Dependent Variables (T2)									
Predictors	LAW	INDEP	PEER	HOME	RELIG	SNP	SNF	DRKF	DEV	Q-F
Age	-.100	-.052	-.011	.031	-.027	-.125	.013	.083	-.023	.009
	(.012)	(.014)	(.008)	(.013)	(.010)	(.017)	(.010)	(.012)	(.003)	(.014)
Mills	.300	.235	.098	.213	.101	.607	.319	-.301	.167	-.535
	(.159)	(.204)	(.116)	(.134)	(.134)	(.243)	(.161)	(.174)	(.039)	(.183)
LAWT1	.502	.175		-.037					.009	.015
	(.018)	(.022)		(.012)					(.004)	(.020)
INDEPT1	.061	.381							-.002	.047
	(.015)	(.019)							(.004)	(.016)
PEERT1			.624	.114				.047	.002	.061
			(.016)	(.016)				(.014)	(.005)	(.024)
HOMET1			.060	.496		-.083			-.006	-.005
			(.014)	(.028)		(.027)			(.005)	(.023)
RELIGT1	-.049	-.041			.746	.077	.034		-.004	-.008
	(.017)	(.020)			(.019)	(.024)	(.014)		(.004)	(.018)
SNPT1					.023	.489		.041	.004	-.029
					(.009)	(.022)		(.012)	(.003)	(.014)
SNFT1	-.044					.093	.367	-.091	-.011	-.092
	(.013)					(.022)	(.026)	(.011)	(.004)	(.017)
DRKFT1					-.001	-.281	-.076	.425	-.004	.121
					(.018)	(.027)	(.026)	(.020)	(.006)	(.031)
DEVT1	.284	.232		-.203				-.014	.535	.288
	(.069)	(.084)		(.049)				(.077)	(.017)	(.079)
Q-FT1			.092			-.074	-.037	.074	.009	.558
			(.017)			(.023)	(.014)	(.011)	(.004)	(.019)

Note: Standard errors are given in parentheses.

Table E-4: (continued)

Irish female	Dependent Variables												
Predictor	LAW T2	INDEP T2	PEER T2	POSE T2	NEGE T2	POSV T2	SNP T2	SNF T2	DRKP T2	DRKF T2	AVAIL T2	DEV T2	Q-F T2
Age	-.100	-.051	-.027	-.045	-.127	-.080	-.188	.013	-.022	.089	.168	-.024	.005
	(.013)	(.014)	(.009)	(.014)	(.026)	(.012)	(.023)	(.010)	(.008)	(.009)	(.023)	(.004)	(.013)
Mills	.279	.246	.150	-.245	.063	-.312	.455	.281	-.074	-.322	-.153	.166	-.541
	(.161)	(.204)	(.118)	(.228)	(.215)	(.210)	(.245)	(.158)	(.104)	(.111)	(.213)	(.038)	(.181)
LAWT1	.503	.176	-.009			.012			.009				
	(.018)	(.022)	(.013)			(.019)			(.011)				
INDEPT1	.070	.387											.053
	(.015)	(.019)											(.014)
PEERT1			.638		.046	.019			-.051	.045	.127		
			(.015)		(.052)	(.048)			(.026)	(.013)	(.027)		
POSET1	-.002			.404	-.048	.146	.068				.090	.008	.080
	(.014)			(.018)	(.017)	(.021)	(.034)				(.017)	(.003)	(.014)
NEGET1			-.068		.429			.048					-.078
			(.018)		(.033)			(.012)					(.015)
POSVT1				.068	-.041	.499		-.108		.027			
				(.027)	(.017)	(.017)		(.022)		(.009)			
SNPT1							.446		-.023	.040			
							(.023)		(.007)	(.012)			
SNFT1				.074	.086	.010	.085	.297		-.074	-.053		
				(.040)	(.019)	(.036)	(.022)	(.021)		(.010)	(.016)		
DRKPT1							-.164		.753	.033			
							(.025)		(.018)	(.011)			
DRKFT1					-.126		-.284	-.079		.426			.134
					(.030)		(.067)	(.024)		(.020)			(.029)
AVAILT1				.059		.017			.026		.477		.048
				(.017)		(.018)			(.009)		(.019)		(.015)
DEVT1	.258	.237							.097	-.029		.548	.223
	(.073)	(.085)							(.077)	(.078)		(.016)	(.075)
Q-FT1	.031		.038				-.070			.056		.010	.531
	(.015)		(.011)				(.023)			(.011)		(.004)	(.019)

Note: Standard errors are given in parentheses.

Appendix D

COMMITTEE ON HUMAN RESEARCH
OFFICE OF RESEARCH AFFAIRS, Box 0962
UNIVERSITY OF CALIFORNIA, SAN FRANCISCO
http://www.ucsf.edu/ora

CHR APPROVAL LETTER

TO: Robert J. Newcomer, Ph.D.
Box 0612

Meng-Jinn Chen, M.A. & M.P.H.
545 Pierce St.
#2213
Albany, CA 94706

RE: Adolescent Drinking: A cross-cultural comparison between US and Ireland

The Committee on Human Research (CHR), the UCSF Institutional Review Board (IRB) holding Department of Health and Human Services Multiple Project Assurance #M-1169, has reviewed and approved this application to involve humans as research subjects. This included a review of all documents attached to the original copy of this letter.

APPROVAL NUMBER: H945-15991-01.This number is a UCSF CHR number and should be used on all correspondence, consent forms and patient charts as appropriate.

APPROVAL DATE: January 27, 1999. **Expedited Review**

EXPIRATION DATE: January 27, 2000. If the project is to continue, it must be renewed *by the expiration date*. See reverse side for details.

ADVERSE EVENT REPORTING: All problems having to do with subject safety must be reported to the CHR within ten working days. All deaths, whether or not they are directly related to study procedures, must be reported. Please review Appendix A of the CHR *Guidelines* for additional examples of adverse events or incidents which must be reported.

MODIFICATIONS: Prior CHR approval is required before implementing any changes in the consent documents or any changes in the protocol which affect subjects.

QUESTIONS: Please contact the office of the Committee on Human Research at (415) 476-1814 or campus mail stop, Box 0962, or by electronic mail at chr@itsa.ucsf.edu.

Sincerely,

James Kahn

James O. Kahn, M.D.
Chairman
Committee on Human Research