ADOLESCENT ALCOHOL USE AS A GOAL-DIRECTED BEHAVIOUR

by

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A Dissertation Submitted in Partial Fulfillment of the
Requirements for the Degree of

DOCTOR OF PHILOSOPHY

in the Department of Psychology

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ABSTRACT

Although excessive alcohol use poses serious risks to individual well-being, drinking alcohol may serve important functions for adolescents. Guided by the developmental action perspective, the present research examined: (a) the subjective functions that alcohol use serves for older adolescents by studying their perceptions of the importance of experiencing and avoiding consequences of drinking; (b) the extent to which these importance ratings predicted levels of alcohol use; and (c) changes in importance ratings and in drinking behaviour following experience with alcohol. In Study 1, the Scale Construction Phase, data collected from 96 young adult university students (mean age = 23.6 years) were used to develop reliable scales measuring the importance of experiencing four positive consequences (Fun, Peer Experience, Relaxation/Coping, Image/Reputation) and avoiding three negative consequences (Physical, Behavioural, Driving-related) of drinking. In Study 2, the Drinking and Social Behaviour Survey, late adolescent university students (mean age = 18.7 years) completed questionnaires on two occasions at the start of the academic year ($\underline{n}$ = 344 at Time 1 and $\underline{n}$ = 169 at Time 2). Three groups of variables were assessed: (a) the importance of experiencing and avoiding consequences of drinking; (b) levels of alcohol use (actual and planned); and (c) frequency of experiencing the seven consequences of drinking. Descriptive analyses examined gender differences in alcohol use and gender and category (i.e., positive vs.

negative) differences in importance ratings and experienced consequences. Explanatory analyses demonstrated that importance ratings of positive and negative consequences predicted concurrent and subsequent changes in alcohol use. Moreover, multiple regression and path analyses (using LISREL) showed that the experience of positive but not negative drinking-related consequences predicted short-term changes in positive and negative importance ratings and in intentions to drink. The discussion focuses on the active role played by the adolescent participants in shaping their own drinking behaviour, and on the relative importance of positive versus negative consequences in motivating or limiting adolescent alcohol use.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Acknowledgements

I would like to acknowledge the assistance and support of several people. To my supervisor, Dr. Nancy Galambos, thank you for all of the guidance, assistance, and advice you provided throughout my graduate education. Thank you also for your pivotal role in getting Dave and I together. Thank you, Dr. Mike Hunter, for your sound design and statistical counsel. To Dr. Pam Duncan, Dr. Elizabeth Lüüs, and Dr. Donald Knowles, thank you for your support and suggestions. Thanks also to Dr. Dawn Howard-Rose, for attending the defense, and to Dr. Patricia East, for serving as the external examiner.

A very big thank you is due to Marc Gaucher and the RAs at Housing Services. Without their (volunteer) work recruiting participants and collecting surveys, this project would have been impossible. To all the students who completed surveys, I offer my sincere appreciation.

To David Almeida, a heartfelt thank you for your nurturance, companionship, and love. Thanks also for being my PR specialist and promoting my ideas at home and abroad. To my Maggs family, Derek, Ruth, David, Bethany, Wesley, and Grace, thank you for your continued warmth, support, and love. Thanks Wes, for telling your friends I had a Ph.D. even before it was true. To my Almeida family, Ken, Patsy, Lori, Neal, Kristi, Randy, Jodi, and Paul, thank you for welcoming me into your family, and for your love, interest, and concern. To all my friends at UVic, who I dare not mention in case I forget someone, thanks for lots of great times--I will miss you.

Dedication

To Nana

Enid Maggs Lindsay

1897-1992

CHAPTER I

INTRODUCTION

Alcohol use among North American youth is very common and shows distinct developmental trends. Levels of alcohol use reach their peak during late adolescence and early adulthood (Health & Welfare Canada, 1988; Jessor, 1986, 1987; Jessor & Jessor, 1977; Sharpe & Lowe, 1989; Siggner, 1988; Silbereisen & Eyferth, 1986). That is, the frequency and quantity of alcohol consumption increases throughout adolescence, then tends to decline as individuals take on adult roles in society (Jessor, 1987; Kandel, 1986; Kandel & Yamaguchi, 1985; Schulenberg, O'Malley, Bachman, & Johnston, 1992). For example, Canada's Health Promotion Survey (Health and Welfare Canada, 1988; Siggner, 1988) found that 72% of 20- to 24-year-olds reported consuming alcohol regularly. Percentages for 15- to 19-year-olds and those over 25 were lower: 52% and 63%, respectively. These figures are consistent with American, British, and German studies demonstrating that alcohol use increases throughout adolescence, peaks, then declines when adult work and family roles are adopted (Barnes, Welte, & Dintcheff, 1992; Grant, Harford, & Grigson, 1988; Jessor, 1986, 1987; Kandel, 1986; Kandel & Yamaguchi, 1985; Miller-Tutzauer, Leonard, & Windle, 1991; Schulenberg et al., 1992; Sharpe & Lowe, 1989; Silbereisen & Eyferth, 1986).

The high prevalence of alcohol use among Canadian adolescents is of great import due to its harmful consequences for individual health and for society. Excessive alcohol consumption carries both short-term risks (e.g., car

accidents) and long-term risks (e.g., cirrhosis of the liver) for individual safety and well-being (Friedman, 1989; Newcomb & Bentler, 1988, 1989). In British Columbia, for example, alcohol is a contributing factor in 500 motor-vehicle deaths annually, as well as 30% of domestic homicides, 45% of drownings, and 70% of accidental poisonings (British Columbia Royal Commission on Health Care and Costs, 1991). Taken together, the Royal Commission estimated the annual financial costs of substance use in B.C. at 2 to 5 billion dollars.

Although it has serious consequences for health, drinking may serve important functions for adolescents (Hurrelmann, 1990). For instance, developmental theorists have argued that adolescents drink in order to oppose adult authority, attempt to cope with stress, attain peer acceptance, satisfy curiosity, or explore personal identities (Jessor, 1987; Silbereisen & Eyferth, 1986). A certain amount of risk-taking and experimentation may be indicative of psychological well-being (Baumrind, 1985, 1987; Shedler & Block, 1990), and may be interpreted as an important strategy for dealing with the developmental tasks associated with the transition to adulthood (Newcomb & Bentler, 1988; Silbereisen & Noack, 1988). Empirical research on adolescents' subjective reasons for drinking points to the importance of immediate gratification as a motivating factor (Johnston & O'Malley, 1986). Thus, from the adolescent's perspective, drinking may be functional, purposeful, and may achieve immediate personal goals.

The developmental action perspective (Brandtstädter, 1984; Chapman &

Skinner, 1985; Silbereisen & Eyferth, 1986) provided the theoretical approach to the present study. According to this perspective, humans actively influence their own health through their behaviour and lifestyle (Friedman, 1989; Hurrelmann, 1990). Because alcohol use can impair health, the process by which individuals manage their own drinking behaviour is of primary interest. In this regard, the general objectives of the present study were to examine: (a) the subjective functions that alcohol use serves for older adolescents by studying their perceptions of the importance of experiencing and avoiding consequences of drinking; (b) the relationship of the importance of experiencing/avoiding consequences of drinking with levels of alcohol use; and (c) change in importance ratings and in drinking behaviour following naturally-occurring experience with alcohol.

The research was accomplished in two main phases. In Study 1, measures were developed to assess the importance of experiencing or avoiding consequences of alcohol use. Study 2 was a survey of 344 university students living in on-campus housing. Questionnaires collected on two occasions three weeks apart assessed participants' levels of alcohol use, importance of experiencing or avoiding consequences of drinking, and the frequency with which they experienced these consequences.

CHAPTER II

REVIEW OF THE LITERATURE

The present chapter discusses the literature relevant to the present study. First, the theoretical perspective that guided the research is introduced. Next, a definition of problem behaviour is proposed, followed by a discussion of the psychosocial antecedents of adolescent alcohol use. Subsequent sections focus on developmental functions of alcohol use and review research on alcohol expectancies. The final sections present the design and the hypotheses that guided the research.

Theoretical Perspective

The developmental action perspective assumes that human development is initiated and directed by the intentions and goals of the developing individuals (Brandtstädter, 1984; Chapman & Skinner, 1985; Hurrelmann, 1989; Lerner & Busch-Rossnagel, 1981; Silbereisen, 1985). That is, humans shape their own development through goal-directed action. The term "action" is used to denote purposive, self-directed behaviour (Silbereisen & Eyferth, 1986).

According to this perspective, humans act in concert with their own beliefs and goals, and longer-term changes in beliefs result from evaluations regarding the success or failure of one's actions (Brandtstädter, 1984; Chapman & Skinner, 1985). It is through repeated action sequences in which behaviours are planned, carried out, and evaluated that change in behaviour occurs. In other words, individual beliefs and goals shape the behaviours (or actions) that

a person will choose to perform. When an action is carried out, the person will evaluate its success or failure relative to the original goals. Actions that are deemed successful will tend to be repeated, whereas actions that do not succeed in achieving the intended results will not.

This research was guided by a developmental action perspective applied to adolescent alcohol use (Silbereisen & Eyferth, 1986). Individuals are assumed to have beliefs about potential consequences that will ensue if they consume alcohol (Bauman, Fisher, Bryan, & Chenoweth, 1985; Hurrelmann, 1990). These beliefs can be said to motivate drinking behaviour (Jessor, 1987). Thus, drinking is conceived of as a rational behaviour that is consistent with individual beliefs and goals. From this perspective, drinking alcohol is a purposive act that individuals may use to maximize pleasurable experiences and minimize unpleasurable ones. Individual differences in the importance of experiencing positive consequences as a result of drinking, as well as individual differences in the importance of avoiding negative consequences, are postulated to predict levels of alcohol use.

Before examining the functions that alcohol use may serve in adolescent development, it is important to put adolescent drinking in context by first defining problem behaviour (of which alcohol use is a representative example), and by reviewing research on the psychosocial antecedents of adolescent alcohol use. The following two sections address these two issues.

Defining Adolescent Problem Behaviour

Although there is a plethora of research and theories about adolescent problem behaviour or risk-taking, there is no generally agreed-upon definition of problem behaviour. Researchers and the general public alike, however, have similar and consistent views about what behaviours engaged in by adolescents should be considered problem behaviours. Behaviours such as smoking, drinking, fighting, sexual activity, driving around aimlessly, hanging out in public places, and any type of defiance of adult authority are common examples (cf., Elliott, Huizinga, & Ageton, 1985; Jessor & Jessor, 1977; Kaplan, Johnson, & Bailey, 1986; Shedler & Block, 1990).

Recent definitions of adolescent problem behaviour typically include at least one of the following two elements: (a) violation of social norms for behaviour; and (b) the risk of negative consequences to the individual or to others. Kaplan et al. (1986) defined deviant behaviour as behaviour that violates conventional normative patterns. Examples of such behaviours are truancy, drug use, theft, and fighting. Implicit in this definition is that the normative patterns are those established by mature, responsible citizens, typically adults. It is arguable that some "deviant" behaviours, such as experimentation with marijuana, are normative for adolescents, in the sense of being engaged in by the majority of adolescents, many without negative consequences (Baumrind, 1985; Newcomb & Bentler, 1989; Shedler & Block, 1990). Thus, it is more accurate to state that adolescent problem behaviours

are acts that violate conventional adult social norms for adolescent behaviour.

Other definitions emphasize the second element, the risk of negative consequences associated with the behaviours (Arnett, 1992; Hurrelmann, 1990). For example, Hurrelmann (1990) defined problem behaviour as personal behaviours that contribute to morbidity and mortality. Examples are smoking, excessive drinking, unprotected or precocious sexual intercourse, and lack of regular participation in sports or exercise. Here the concern is with the well-being of individuals and those around them, rather than with normative patterns of behaviour. Adolescence is described as a period of life characterized by more experimentation and risk-taking than any other, and problem behaviours are interpreted as purposive, goal-directed acts engaged in by adolescents for many functional reasons. However, Hurrelmann (1990) argued that the health risks associated with many such behaviours make it imperative that others (parents, teachers, youth workers, social planners, etc.) seek to provide viable alternative opportunities that can meet adolescents' needs more safely. For this reason, it is essential that researchers determine the functions fulfilled by problem behaviours in order that alternative equivalent options can be substituted or at least made available to adolescents.

Jessor's (1986; Jessor & Jessor, 1977) definition of problem behaviour includes both elements. He defines problem behaviour as behaviour that departs from the norms of the larger adult society, and that tends to elicit a social control response, whether mild criticism, social rejection, or even

incarceration. The focus in this definition is on the social consequences of getting caught or, in other words, the reactions of other individuals (e.g., family, friends, law enforcement officials) to the behaviours in question, rather than to dangers inherent in the behaviours themselves (e.g., accident while driving drunk, sexually transmitted diseases, undesired pregnancy, addiction). Of course, part of the reaction of others to such behaviours is based on perceptions of potential negative consequences of the behaviours themselves, but this is not stated explicitly in Jessor's definition.

In addition to the two elements discussed above (violations of social norms, and negative consequences of the acts), definitions of problem behaviour should also consider possible functions served by problem behaviour for adolescents (Fine, 1988; Hurrelmann, 1990; Jessor, 1987; Maggs & Galambos, 1993; Murray & Perry, 1985). In the short term, adolescents take risks because it is immediately rewarding to do so (Johnston & O'Malley, 1986). For example, the adventure of exploring new behaviours, curiosity about how one will feel, and even the fear of getting caught probably all constitute "reasons" for engaging in problem behaviour. Moreover, despite the serious physical and psychological risks associated with problem behaviours, developmental psychologists have argued that such risk-taking may have important long-term constructive effects on adolescents' development (e.g., Baumrind, 1985; Hurrelmann, 1990; Jessor, 1987; Silbereisen & Noack, 1988). For example, experimenting with problem behaviours may help adolescents to

explore personal identities, participate in peer culture, or cope with stress. Incorporating the above perspectives and conclusions, then, the present investigation defined problem behaviour as acts that violate adult social norms for adolescent behaviour and pose risks to the well-being of the individual or others. These behaviours may also serve positive functions for adolescents.

Alcohol Use as a Representative Problem Behaviour

The present investigation targeted a single problem behaviour in order to conduct a more in-depth analysis of adolescents' beliefs about the functions or consequences of that behaviour as they related to risk-taking in that domain. Alcohol consumption was selected as a representative problem behaviour for two reasons. First, alcohol use is extremely common among North American adolescents (Health & Welfare Canada, 1988, 1989; Johnston, 1985; Schulenberg et al., 1992). In fact, some authors have argued that experimentation with alcohol, like other problem behaviours, has become a normative developmental task for adolescents in Western societies (Baumrind, 1985; Jessor, 1987; Hurrelmann, 1990; B.C. Royal Commission on Health Care and Costs, 1991; Newcomb & Bentler, 1988; Schulenberg et al., 1992; Shedler & Block, 1990). Certainly, it is statistically normative to experiment with alcohol during adolescence (Hawkins, Lishner, Catalano, & Howard, 1986; Murray & Perry, 1985; Johnston, 1985).

Second, alcohol use meets all three definitional criteria for problem behaviours described above. That is, adolescent drinking (a) violates societal

(adult) norms for adolescent behaviour (Jessor, 1987; Silbereisen & Noack, 1988); (b) has possible serious negative consequences (Friedman, 1989; Hurrelmann, 1990; Newcomb & Bentler, 1988); and (c) may serve positive functions for adolescent development (Hurrelmann, 1990; Jessor, 1987; Silbereisen & Noack, 1988).

Psychosocial Antecedents of Alcohol Use

Many factors have been identified as antecedents to adolescent drinking. Age and gender are related to the prevalence of alcohol use (Health & Welfare Canada, 1988; Johnston & O'Malley, 1986), but demographic variables such as socioeconomic status, parental education, and ethnicity account for very little variance in drinking patterns, particularly after personal and socio-environmental variables are taken into consideration (Bachman, Johnston, O'Malley, & Humphrey, 1988; Gordon & McAlister, 1982; Jessor, Chase, & Donovan, 1980; Murray & Perry, 1985).

Personal Factors

Personality and character traits predicting higher levels of alcohol use include a high value on and high expectations for independence, a low value on and low expectations for academic achievement, low religiosity, higher alienation, higher social criticism, more tolerant attitudes toward deviant behaviour, and higher rebelliousness (Chassin, Presson, & Sherman, 1989; Harford & Grant, 1987; Hawkins, Lishner, & Catalano, et al., 1987; Jessor, 1987; Murray & Perry, 1985; Newcomb & McGee, 1991). Characteristics such

as being more open to new experiences, more spontaneous, more socially competent, less conforming, and more creative have also been shown to be related to risk-taking behaviours such as alcohol and marijuana use (but not abuse) (Baumrind, 1985; Chassin et al., 1989; Murray & Perry, 1985; Shedler & Block, 1990).

Social-Environmental Factors

Many studies have also documented consistent social-environmental predictors of substance use. These include parental and peer approval and modeling of alcohol use (Harford & Grant, 1987; Kandel, Kessler, & Margulies, 1978; Elliot et al., 1985; Hawkins et al., 1986; Kandel & Andrews, 1987), low parental and peer support (Jessor, 1986, 1987), pressure from peers and family members to consume substances (Murray & Perry, 1985), and low family, school, and community involvement (Jessor & Jessor, 1977; Kandel & Andrews, 1987; Murray & Perry, 1985; Sharpe & Lowe, 1989).

Problem Behaviour Theory

Jessor's problem behaviour theory (Jessor, 1987, 1992; Jessor & Jessor, 1977) is a social-psychological model that incorporates many of these predictors as psychosocial risk factors for adolescent drinking. Jessor and colleagues (e.g., Jessor, 1986, 1987; Jessor et al., 1980; Jessor & Jessor, 1977) have documented the relationship of a group of personality and environmental variables with numerous measures of adolescent problem behaviour, including alcohol use. Together, the two sets of explanatory variables account for sizeable amounts of

variance in problem behaviour during adolescence. For example, between 16 and 50 percent of the variance in problem drinking (e.g., drunkenness) were explained in one study, depending on the specific outcome variable and the gender of the subjects (Jessor, 1987).

In summary, past research has documented various psychosocial correlates of problem behaviours such as alcohol use. Clearly, levels of alcohol use are predicted by individuals' personal characteristics and by their relationships with other people. However, many of these predictors are quite distal and stable (e.g., religiosity, parental support), and therefore may be resistant to external modification. Intervention programs, therefore, may also need to focus on the more immediate functions of drinking, from the perspective of the adolescent drinker, in order to reduce risky drinking behaviour (Jessor, 1982; Murray & Perry, 1985). Relatively little is known, however, about the more proximal functions that are served by adolescent drinking (Silbereisen & Noack, 1988). For instance, there is very little research on how adolescents make decisions about alcohol use, nor about how they evaluate the costs and benefits of drinking. Thus, the present investigation examined the relationship of adolescents' ratings of the importance of experiencing positive and negative consequences of drinking with their levels of alcohol use.

Functions of Alcohol Use

Although alcohol use may have serious negative consequences for

individual health and well-being, drinking may serve important short- and long-term functions in adolescents' lives (Hurrelmann, 1990; Jessor, 1987; Silbereisen & Noack, 1988). The following section discusses, first, the proposition that problem behaviours such as drinking serve important developmental functions and are in fact indicative of healthy adolescent development. Second, proximal functions of alcohol use are discussed as more immediate motivators of drinking behaviour. The section concludes with a discussion of the limitations of past research in this area.

Developmental Functions of Drinking

Many functions of adolescent drinking have been proposed by developmental theorists (Baumrind, 1985, 1987; Hurrelmann, 1990; Jessor, 1986, 1987; Silbereisen & Eyferth, 1986; Silbereisen & Noack, 1988). These reasons include drinking in order to affirm independence from adult authority, attempt to cope with stress, attain peer acceptance, satisfy curiosity, express solidarity with peers, explore personal identities, or to symbolize a transition to a more mature, adult status. Thus, although alcohol use may have serious consequences for individual health and well-being, many developmental psychologists believe that drinking also may serve important constructive functions in adolescent development.

According to Baumrind (1985, 1987), normal adolescent development is characterized by risk-taking behaviour. She argued that although certain risk-taking activities may "have health-endangering consequences, these same

behaviours may simultaneously accompany healthy, mature personality development" (Baumrind, 1987, p. 98). That is, a certain amount of risk-taking is characteristic of competent adolescents. Results from two longitudinal studies support this argument. Baumrind's (1985) 10-year study of child and adolescent development identified numerous positive personal antecedents of substance use initiation. For instance, girls who were more dominant, purposive, and independent at age 4 had experimented with a larger number of substances by age 14, and boys who were more physically competent at age 4 and more socially confident at age 9 had experimented more by age 14.

Similarly, Shedler and Block's (1990) longitudinal study examining personality antecedents and correlates of late adolescent drug use (marijuana and other substances, not including alcohol) also provided support for the argument that a certain level of risk-taking is characteristic of healthy development. When compared with 18-year-old experimenters (those who had tried marijuana and no more than one other drug), individuals who frequently used drugs at age 18 were relatively maladjusted and emotionally distressed as children, and similarly alienated, emotionally withdrawn, and antisocial as adolescents. Those who were abstainers at age 18, relative to experimenters, were overcontrolled, timid, and closed to new experiences as children, and relatively tense, emotionally constricted, and socially isolated as adolescents. Shedler and Block concluded that adolescents who were relatively well-adjusted as children are likely to experiment with some substances but not to use them

frequently. These two studies illustrate that a certain amount of substance use can coincide with healthy psychosocial development.

Adolescents' use of alcohol may be interpreted as a means of dealing with the developmental challenges of adolescence (Jessor, 1987; Silbereisen & Noack, 1988). Developmental tasks typically faced by North American adolescents include achieving independence from parents, establishing adult relations with peers, adopting a personal set of values and goals, and preparing for adult work and family roles (Dreher & Oerter, 1986; Havighurst, 1972; Palmonari, Pombeni, & Kirchler, 1990). This set of challenges may be summarized as a quest for an autonomous identity and lifestyle (Newcomb & Bentler, 1988). The route to independent adult functioning may be characterized by a considerable amount of experimentation with a range of beliefs, behaviours, and orientations. When behaviours such as alcohol use are viewed in this larger context of normative adolescent development, they may be seen as a strategy for coping with typical age-graded challenges or difficulties (Silbereisen & Noack, 1988). For example, drinking may represent an effort to facilitate interactions with peers, try on adult roles and behaviour, indicate opposition to parental norms, or signify independent behaviour (cf., Jessor, 1986).

Not only may experimentation be <u>indicative</u> of psychological health, certain risk-taking behaviours may also <u>promote</u> healthy development. For example, the pursuit of challenging and pleasurable opportunities may lead to

increased self-confidence and initiative. Baumrind (1985) argued that these positive effects are possible even for behaviours typically judged by adults to be hazardous and undesirable for adolescents, such as substance use and sexual activity. An important caveat to this argument is that this positive or at least benign function of substance use is only postulated for the "highly prevalent, quasi-normative use of legal substances, such as alcohol, in a normal population of adolescents, but not for substance abuse or addiction" (Silbereisen & Noack, 1988, p. 173).

The relationship between normative developmental tasks and the use of substances by adolescents is illustrated by several empirical studies. Magnusson, Stattin, and Allen (1985) demonstrated that early menarche among Swedish adolescents predicted higher levels of marijuana use when girls reached middle adolescence. This earlier experimentation with substances was interpreted by the researchers as an attempt by the adolescents to coordinate their social behaviour (substance use) with their biological development. In another study, Silbereisen and Noack (1988) reported that German adolescents used cigarettes and alcohol and offered them to others as a way of initiating peer contacts in social settings such as discos and shopping centres. When viewed from this perspective, there is some evidence that substance use can be interpreted as a rational, purposive, and instrumental act that aids in the realization of personal goals (Furby & Beyth-Marom, 1992; Jessor, 1987).

Short-Term Functions of Alcohol Use

In addition to their longer-term developmental functions, the use of substances such as alcohol may serve immediate functions in adolescents' lives (Silbereisen & Noack, 1988). Indeed, empirical research on adolescents' subjective reasons for drinking points to the desire for immediate gratification as an important motivating factor. For instance, adolescent respondents in the annual U.S. Monitoring the Future surveys indicated that they drank to have a good time with friends, to feel good, to experiment, to relax, and because it tastes good (Johnston & O'Malley, 1986). Similarly, Larson, Csikzentmihalyi, & Freeman (1984), using an experience-sampling method, found that adolescents reported being in a more positive and sociable mood when they were consuming alcohol than at other times. Thus, from the adolescent's perspective, drinking may be a functional, purposive act that achieves immediate personal goals.

The following section reviews a body of research examining people's beliefs about the effects of alcohol on behaviour, known as alcohol expectancies (Goldman, Brown, & Christiansen, 1987; Leigh, 1989c). Although these studies focus on beliefs about alcohol effects in general rather than on the believed effects of alcohol on research participants themselves, the assumption is that these expectancies serve as motivating factors for the participants' drinking behaviour. That is, when relationships are observed between alcohol expectancies and levels of alcohol use, researchers have

assumed that the participants were guided by their beliefs as they made decisions about how much and how often to drink. To a certain extent, then, this body of research is akin to the idea that alcohol use is a rational behaviour that may serve short- and long-term functions for individuals.

Research on Alcohol Expectancies

In 1973, the Social Research Group at the University of California at Berkeley asked survey respondents, "What effect does alcohol have on you?" (Leigh, 1989c). The possible responses (sleepy, dopey, etc.) soon became known as the "seven dwarves" of alcohol expectancies. Since that time, there has been growing interest in people's beliefs about the effects of alcohol, known as alcohol expectancies, and their relation to drinking behaviour (Bauman, Fisher, & Koch, 1989; Blane & Leonard, 1987; Critchlow, 1986; Goldman et al., 1987). The term expectancy in this context refers to beliefs about outcomes, that is, beliefs about the effects that drinking alcohol has on people (Leigh, 1989c). Although respondents are typically not asked what effects alcohol has on them personally, expectancies are assumed to motivate alcohol use (cf., Brown, Goldman, Inn, & Anderson, 1980; Leigh, 1989c; Southwick, Steele, Marlatt, & Lindell, 1981). Thus, interest in alcohol expectancies is partially based on the premise that they may play a role in the initiation and maintenance of drinking behaviour (Bauman & Bryan, 1980; Goldman et al., 1987). As Leigh (1989c) stated, "the decision to initiate a drinking episode is assumed to be driven at least partly by the individual's

belief that alcohol will serve certain functions or result in certain desirable consequences, such as relief from tension or enhancement of mood" (p. 362).

A related body of research examines the influence of alcohol expectancies as a mediator of alcohol's effects on behaviour (cf., Hull & Bond, 1986). For example, when people become more aggressive or outgoing after drinking alcohol, they may do so because they believe that alcohol has these effects on behaviour rather than because of some direct pharmacological effect of alcohol. This hypothesis, which has often been addressed using the balanced placebo design, is beyond the scope of the present study. Rather, the following section focuses on research that has examined the relationship of alcohol expectancies and drinking behaviour. Before reviewing the research that has addressed this relationship, however, existing measures of alcohol expectancies and their limitations will be discussed.

Measures of Alcohol Expectancies

Several multi-dimensional self-report questionnaires have been developed to measure expectancies about the effects of alcohol. Each was developed by factor analyzing a large number of alcohol effects from surveys of adults with varied drinking histories and habits (Leigh, 1989c). The most commonly used questionnaire is the Alcohol Expectancies Questionnaire (AEQ), developed by Brown, Goldman, Inn, and Andres (1980). This 90-item measure has six subscales assessing positive subjective changes derived from alcohol: (a) Global Positive Transformation; (b) Social/Physical Pleasure; (c)

Sexual Enhancement; (d) Social Assertiveness; (e) Power/Aggression; and (f) Relaxation. Expectancies about negative effects are not measured. Respondents indicate whether they agree that alcohol has each of the 90 effects (scored dichotomously: agree/disagree). The six subscales were created by selecting items that had factor loadings greater than .30 and that were nonredundant (did not load higher on any other factor). Although reliability data were not reported in the original studies (Brown et al., 1980; Brown, Goldman, & Christiansen, 1985), more recent articles have stated that Cronbach's coefficient alpha ranged from .67 to .87 for the six subscales (Goldman, Brown, Christiansen, & Smith, 1991), and the mean 8-week test-retest reliability was .64 (Brown, Christiansen, & Goldman, 1987).

Two adaptations of the AEQ have also been developed. Christiansen, Goldman, and Inn's (1982) AEQ for adolescents (AEQ-A) includes a limited number of items describing negative effects of alcohol. These negative expectancies are averaged in with positive effects to yield six subscales that are very similar to those on the original AEQ. Goldman et al. (1991) reported that Cronbach's coefficient alpha ranges from .67 to .82 for the seven subscales on the AEQ-A. Rohsenow (1983) and Collins, Lapp, and Emmons (1990) also adapted the AEQ by adding items to measure two types of negative alcohol effects: Cognitive/Physical Impairment and Careless Unconcern.

A second measure of alcohol expectancies is Southwick, Steele, Marlatt, and Lindell's (1981) 37-item Alcohol Effects Scale (AES). Respondents to the

AES rate 37 bipolar items (e.g, loud/quiet; outgoing/reserved; rude/polite) to indicate how they would be affected by a moderate and a large amount of alcohol. Using exploratory factor analyses, a three-factor solution was selected as the most interpretable description of the data. The three factors were named: (a) Stimulation/Perceived Dominance, (b) Pleasurable Disinhibition, and (c) Behavioral Impairment. Cronbach's coefficient alpha was reported to be over .80 for each scale. Alcohol use was related to Stimulation/Perceived Dominance and Pleasurable Disinhibition scores, but not to Behavioural Impairment scores.

A third measure of alcohol expectancies is Leigh's (Critchlow, 1987; Leigh, 1987) Effects of Drinking Alcohol Scale (EDA). This 20-item self-report questionnaire has five subscales: (a) Nastiness; (b) Disinhibition; (c) Cognitive/Physical Impairment; (d) Gregariousness; and (e) Depressant effects. These scales were distinguished using exploratory factor analysis, and Cronbach's coefficient alpha ranged from .56 to .83. The scales were related to drinking behaviour, but the magnitude of these relationships was not reported.

Several other measures of individual beliefs about the effects of alcohol and of reasons for drinking have been used. Bauman and colleagues (Bauman & Bryan, 1980, 1983; Bauman et al., 1985; Bauman et al., 1989) have developed a 57-item questionnaire to measure young adolescents' beliefs about the desirability and likelihood of multiple positive and negative consequences of alcohol. This measure yields a single score for each participant; beliefs

about multiple dimensions of consequences are not assessed. Harford and Grant (1987) examined the relationship of drinking styles to four positive functions of drinking: (a) Positive Social Functions; (b) Conformity Social Functions; (c) Personal Effects Functions/Coping; and (d) Status Transforming Functions. Similarly, McCarty and Kaye (1984) explored the links between drinking profiles and four reasons for drinking: (a) Drinking to Avoid/Reduce Negative Affect; (b) Social Drinking; (c) Sensation-seeking; and (d) Personal Enjoyment. Beckman and Beardsley (1981) compared normal versus heavy drinking female college students with respect to three factors measuring reasons to drink: (a) Sociability; (b) Feelings of Powerlessness/Inadequacy; and (c) Escapism. Farber, Khavari, and Douglass (1980) proposed two factors representing reasons to drink: (a) Drinking to Avoid/Escape Negative Feelings, and (b) Drinking for Social Reasons or to Experience Positive Reinforcement. However, each of these scales has important limitations. As mentioned above, Bauman and Bryan's (1980, 1983) measure of subjective expected utility does not measure different dimensions of beliefs. The other scales, where information is reported, have inconsistent reliability (e.g., alphas of .46 to .86, Collins et al., 1990), low factor loadings (e.g., median loading of .47, Farber et al., 1980), and a relatively small percentage of variance accounted for by the factor solutions used to create the subscales (e.g., 27%, Farber et al., 1980; 35.8%, McCarty & Kaye, 1984). (Beckman & Beardsley [1981] provided no measurement information.)

Leigh (1989b) conducted a more systematic examination of the measurement properties of the three primary scales of alcohol expectancies (AEQ, Brown et al., 1980; EDA, Leigh, 1987; AES, Southwick et al., 1980). The extent to which the empirical structure of alcohol expectancies conformed to that proposed by their creators was examined. Using data collected from 534 students (mean age = 19 years), the hypothesized factor structures of the three scales were evaluated in a series of confirmatory factor analyses. Models were tested in which each item was constrained to load on a single factor. Latent variables were permitted to correlate with each other. Although the assertion of such simple structure represented a conservative test, Leigh (1989b) argued it was justified as most research has assumed that the scales measured distinct and independent domains (cf., Brown, 1985; Brown et al., 1987).

The results showed that each of the three scales deviated significantly from their hypothesized structures. The major problem for all three scales centred around discriminant validity. That is, the latent variables of all three measures (AEQ, Brown et al., 1980; AES, Southwick et al., 1981; EDA, Leigh, 1987) had intercorrelations of up to .76, and the modification indices showed that one-third to one-half of the items would have significant cross-factor loadings if they were unconstrained. In addition, subscales on the AES and the EDA had low reliabilities, and many items on the AEQ had very poor face validity. For example, "drinking makes get-togethers more fun" is an item on

the AEQ tension reduction scale; "drinking is like permission to forget problems" is an item on the AEQ power/aggression subscale; Leigh & Stacy, 1991).

On the basis of these analyses, Leigh (1989b) concluded that researchers should recognize that the latent variables assumed to be measured by these scales are not distinct and independent. Moreover, she argued that further scale development and/or refinement were crucial. Specific recommendations for this enterprise included: (a) assessing beliefs about positive and negative consequences; (b) starting with an a priori taxonomy to create logically-distinct subscales, rather than relying on exploratory factor analytic procedures; and (c) conducting longitudinal studies to examine whether changes in expectancies predict changes in behaviour. The present study addressed each of these issues.

Alcohol Expectancies and Drinking Behaviour

The relationship of expectancies about the effects of alcohol with individual drinking behaviour has been the subject of numerous studies. Although most of the scales discussed above do not ask directly about reasons for drinking or even what effects alcohol has on the individual respondents' themselves, expectancies are believed to motivate drinking behaviour (cf., Bauman & Bryan, 1980; Brown et al., 1980; Leigh, 1989c; Southwick et al., 1981). In support of this idea, a statistical prediction of current and past drinking behaviour by alcohol expectancies is a reliable finding of numerous

studies (Bauman & Bryan, 1983; Bauman et al., 1985; Brown, 1985; Brown et al., 1980; Brown et al., 1985; Brown, Creamer, & Stetson, 1987; Christiansen et al., 1982; Collins et al., 1990; Critchlow, 1987; Farber et al., 1980; Leigh, 1989c; Mooney, Fromme, Kivlahan, & Marlatt, 1987; Rohsenow, 1983; Southwick et al., 1981). Moreover, expectancies about alcohol effects have been shown to exist prior to the onset of drinking in school-aged children, and to become increasingly positive with age (Christiansen et al., 1982; Miller, Smith, & Goldman, 1990). However, there are three primary limitations to this previous research.

First, the amount of variance in drinking behaviour or drinking status explained by existing measures of alcohol expectancies is variable and tends to be relatively modest (Furby & Beyth-Marom, 1992). For example, Leigh (1989b) compared the extent to which three scales of alcohol expectancies (AEQ, Brown et al., 1980; AES, Southwick et al., 1981; EDA, Leigh, 1987) predicted various measures of drinking behaviour. Between 10% and 19% of the variance in alcohol use was predicted by the AEQ and by the EDA, however the AES accounted for only 1% of the variance in drinking. Similarly, Bauman and colleagues' (e.g., Bauman et al., 1985; Bauman et al., 1989) measure of subjective expected utility typically predicts less than 15% of the variance in alcohol use, depending on the sample, beverage, and time of measurement. Relations observed in other studies have been of even smaller magnitude. For example, McCarty and Kaye's (1984) four-factor measure of

reasons for drinking accounted for nine percent of the variance in drinking profiles.

Second, relatively few studies have examined expectancies regarding negative consequences of alcohol, although there is some evidence that beliefs about certain negative effects such as cognitive and physical impairment are negatively related to drinking behaviour (Collins et al., 1990; Leigh, 1987, 1989a; McCarty, Morrison, & Mills, 1983; Rohsenow, 1983). Bauman and colleagues' (Bauman & Bryan, 1980, 1983; Bauman et al., 1985; Bauman et al., 1989) measure of subjective expected utility included beliefs about negative as well as positive effects of alcohol. However, these were combined together into one score, thereby not identifying the unique contribution of positive and negative expectancies to the prediction of drinking behaviour. Thus, previous research has neglected potentially important expectancies regarding negative effects by focusing exclusively on positive reinforcement expectancies (Collins et al., 1990; Leigh, 1987, 1989c; Mooney et al., 1987).

Third, very few studies have examined the extent to which expectancies predict future alcohol use (Leigh, 1989c). As almost all studies have been cross-sectional, the direction of causality remains unclear. A notable exception is Bauman et al.'s (1985) longitudinal study of young adolescents' beliefs about consequences of drinking alcohol. The subjective expected utility of 57 consequences of alcohol (the extent to which more good or bad is expected, computed as the product of desirability and likelihood ratings) predicted 2% to

4% of the variance in beer consumption one year later. The lack of longitudinal studies remains an important limitation to this area of research (Brown, 1985; Brown et al., 1987; Critchlow, 1987; Leigh, 1989c).

The present study aimed to address these three weaknesses of past research. Specifically, by first developing reliable scales measuring multiple categories of consequences of drinking, the goal was to demonstrate clear and consistent relationships between individual beliefs and drinking behaviour. Second, both positive and negative consequences were assessed. Third, data were collected at two times of measurement in order to examine the extent to which beliefs predicted future behaviour.

As mentioned previously, measures of alcohol expectancies typically ask respondents to: (a) indicate the effects alcohol has on people generally (e.g., Brown et al., 1980; Collins et al., 1990); or (b) rate the desirability and probability of various consequences happening to them as a result of drinking (e.g., Bauman et al., 1989; Critchlow, 1987). Both approaches assume that observed relationships of these beliefs or opinions with levels of alcohol use are indicative of individual differences in personal motivations to experience the various consequences. The present study used an alternative approach. That is, respondents were asked to indicate how important it was to them individually to experience or avoid various positive and negative consequences of drinking. Other researchers have suggested that the importance of drinking-related consequences may be an interesting and perhaps a powerful predictor

of alcohol use (e.g., Bauman et al., 1989; Leigh, 1989c). A benefit of this strategy was that it assessed more directly the respondents' reasons for drinking and for limiting drinking, rather than inferring these reasons from their beliefs about alcohol's effects on people in general. Although a few studies have examined "reasons for drinking" directly (e.g., Beckman & Beardsley, 1991; McCarty & Kaye, 1984), the measures used in these studies had unknown or very poor measurement properties, as discussed previously.

Design

The present research examined the relationship between university students' ratings of the importance of experiencing or avoiding drinking-related consequences with their levels of alcohol use. The research was conducted in two phases. Study 1 was a Scale Construction Phase in which data collected from 96 university students were used to develop scales measuring seven categories of consequences of drinking. Study 2 was the Drinking and Social Behaviour Survey in which 344 first-year university students completed questionnaires at the start of the school year. Data collected from a subset (n = 169) of the same group of participants three weeks following the primary study permitted the analysis of hypotheses regarding changes in importance ratings and in alcohol use following experience with alcohol.

Three groups of variables were assessed: (a) the importance of experiencing four positive consequences of drinking and of avoiding three negative consequences of drinking; (b) levels of alcohol use (actual and

planned); (c) frequency of experiencing the four positive and three negative consequences as a result of drinking.

The main analyses centred around two themes: (a) descriptive analyses examined gender differences in alcohol use and gender and category (e.g., positive vs. negative consequence) differences in the importance ratings and experienced consequences; and (b) explanatory analyses examined the concurrent and longitudinal relationships between importance ratings, levels of alcohol use, and experienced consequences.

Hypotheses

The following section presents the hypotheses that guided the research. Hypotheses 1 and 2 were tested in Study 1, the Scale Construction Phase, and Hypotheses 3 to 10 were evaluated in Study 2, the Drinking and Social Behaviour Survey. Each hypothesis is followed by a brief discussion of its underlying rationale.

Study 1: Scale Construction Phase

The purpose of Study 1 was to develop a set of reliable scales to measure older adolescents' ratings of the importance of experiencing positive consequences of drinking and of avoiding negative consequences of drinking. The goal was to develop a set of items that: (a) was suggested by adolescent and young adult consultants; and (b) measured multiple categories of consequences of drinking reliably.

Prior to Study 1, a large number of items representing possible positive

and negative consequences of drinking were written by the researcher based on previous research (e.g., Bauman et al., 1985; Johnson & O'Malley, 1986) and in consultation with older adolescent and young adult consultants. Based on these items, seven logically distinct categories of consequences of drinking were defined: having Fun, sharing in Peer Experience, Relaxation/Coping, Image/Reputation, Physical effects, Behavioural effects, and Driving-related consequences (see Table 1 for definitions). The first 4 categories of consequences were defined as being positive consequences, and the final 3 were defined as being negative. Expert raters coded 78 of these items into the 7 categories (see Chapter 3 for a more detailed description of this process).

Insert Table 1 about here

The subjects for the Scale Construction Phase were 96 students enrolled in courses at the University of Victoria who were aged 30 years or younger. These participants completed questionnaires concerning their alcohol use, opportunity to drink, and the importance and probability of experiencing or avoiding the seven categories of consequences of drinking. Table 2 presents a summary of the hypotheses guiding Study 1 and Study 2.

Insert Table 2 about here

Hypothesis 1

Hypothesis. Importance ratings of the items representing each of the seven categories of consequences will form seven internally consistent scales (Fun, Peer Experience, Relaxation/Coping, Image/Reputation, Physical, Behavioural, and Driving-Related consequences).

Rationale. If the set of items selected to measure each category represents a homogeneous domain as defined by the conceptual definitions in Table 1, ratings of the items' importance within each category should be relatively consistent (Anastasi, 1988).

Hypothesis 2

Hypotheses. (2a) Ratings of the importance of experiencing positive consequences and avoiding negative consequences of drinking will be significantly related to levels of alcohol use. Specifically, ratings of the importance of experiencing positive consequences of drinking will be positively related to levels of alcohol use, and ratings of the importance of avoiding negative consequences of drinking will be negatively related to levels of alcohol use.

(2b) When importance ratings are weighted by ratings of the probability of each consequence occurring, their relationship with alcohol use will be significantly larger.

Rationale. (2a) A relationship between importance and drinking behaviour was expected because subjects were hypothesized to act in ways that

would lead to the experience of positive consequences and the avoidance of negative consequences (see Hypothesis 6 for full rationale). Thus, it was important to demonstrate that the items selected in the Scale Construction Phase were, in fact, related to drinking behaviour.

(2b) Some authors have argued that beliefs about the consequences of a behaviour may differ in their salience as predictors of that behaviour depending on subjects' beliefs about the probability of those consequences occurring (cf., Ajzen, 1985; Ajzen & Madden, 1986; Bauman & Bryan, 1980; Critchlow, 1987). Consequences that subjects believe will definitely occur may be more relevant to decisions about alcohol consumption than consequences believed to be totally impossible. According to this argument, subjects would tend to give more weight to consequences deemed probable than to consequences deemed improbable. If this hypothesis were true, the prediction of intended and actual alcohol use would be enhanced when items were weighted by probability ratings.

The purpose of evaluating Hypothesis 2b was to identify the better predictor of alcohol use. If the weighted importance ratings were found to be better predictors, they would be used as the measures of importance in all subsequent analyses. If not, the simple (unweighted) importance ratings would be used. The relationship of the weights themselves (probability ratings) with alcohol use was <u>not</u> of primary interest, as such a relationship was not predicted by the theory or by past research (cf., Leigh, 1989a).

Study 2: Drinking and Social Behaviour Survey

Participants for the Drinking and Social Behaviour Survey were recruited from residences housing first-year students at the University of Victoria (n = 344). Surveys were completed by the participants at the start of the academic year, and a subset (n = 169) completed surveys on a second occasion, three weeks later. The hypotheses that guided Study 2 are presented below, and are summarized in Table 2.

Hypotheses about Concurrent Relationships

Hypothesis 3

Hypothesis. On average, males' levels of alcohol use will be higher than females' levels of alcohol use.

Rationale. Many studies have shown that although very similar proportions of male and female late adolescents ever consume alcohol, males are more likely to consume large quantities of alcohol frequently (e.g., Health & Welfare Canada, 1988; Jessor, Donovan, & Costa, 1991; Jessor & Jessor, 1977; Johnston, Bachman, & O'Malley, 1981; Perkins, 1992; Siggner, 1988). For example, Siggner (1988) found that almost 20% of Canadian males aged 20 to 24 years reported consuming 8 or more drinks in 1 day in the previous week, compared to 4% of 20- to 24-year-old females. Similarly, Johnston et al. (1981) reported that over 25% of male Grade 12 students in the United States had consumed 5 or more drinks in a row on 3 or more occasions in the previous 2 weeks, compared to less than 12% of female students. Thus, past research

suggests that males, on average, tend to consume more alcohol than do females.

Hypothesis 4

Hypothesis. On average, males will have more pro-drinking goals than will females. Relative to females, males will rate the positive consequences as more important to experience. Relative to males, females will rate the negative consequences as more important to avoid.

Rationale. As a preliminary step in attempting to account for gender differences in drinking behaviour, gender differences in the importance of experiencing and avoiding drinking-related consequences were examined. Based on the assumption that drinking is a functional behaviour that achieves immediate goals (Hurrelmann, 1990; Silbereisen & Noack, 1988), it was predicted that there would be differences between males and females in the goals they wished to achieve by drinking (Bauman & Bryan, 1983). Perhaps females, on average, view the positive consequences of consuming large quantities of alcohol as less important to experience, and view the negative consequences of drinking as more important to avoid, relative to males (Wilsnack & Wilsnack, 1978). According to this logic, perhaps males drink to excess more often than females do because males associate this behaviour with more positive (e.g., gaining peer acceptance) and fewer negative (e.g., doing something stupid) consequences than do females. Hypothesis 4 evaluated this possibility by examining gender differences in the importance of experiencing

or avoiding the consequences of drinking. (The relationship of gender, importance ratings, and alcohol use was addressed in Hypothesis 7.)

Comment. Hypothesis 3 tested whether gender differences in drinking were observed in the present sample. Hypothesis 4 tested for gender differences in importance ratings. Following confirmation of Hypotheses 3 and 4, Hypothesis 7 examined whether gender differences in alcohol use were an indirect effect of gender differences in importance ratings.

Hypothesis 5

Hypothesis. (5a) Participants will report that they experienced the positive consequences relatively more frequently than they experienced the negative consequences.

(5b) On average, males will experience a higher level of both positive and negative consequences of drinking.

Rationale. (5a) Given that it was assumed that individuals act in ways that maximize the experience of positive consequences and minimize the experience of negative consequences, it was expected that participants would report experiencing positive consequences more frequently than negative consequences.

(5b) If males consume more alcohol (Hypothesis 3), it follows that they should experience a higher level of drinking-related consequences, both positive and negative. The purpose of testing Hypothesis 5b was to evaluate whether males' levels of consumption are meaningfully greater than females'. An

argument could be made that since males, on average, are larger than females, they are able to consume a larger quantity of alcohol without experiencing a higher level of consequences. The confirmation of Hypothesis 5b would refute this argument, namely that young adult males' greater consumption of alcohol is an artifact of their larger average size and different metabolism, relative to females'.

Hypothesis 6

Hypothesis. Ratings of the importance of experiencing positive and avoiding negative consequences of drinking will predict concurrent levels of alcohol use (same as Hypothesis 2 in the Scale Construction Phase).

Rationale. The developmental action perspective assumes that human action is shaped by individual goals and intentions (Brandtstädter, 1984; Silbereisen & Eyferth, 1986). In other words, behaviour is directed by individual beliefs and motivations. In the present study, individuals were postulated to have beliefs about a wide range of possible consequences that might occur if they drank alcohol (Bauman & Bryan, 1980; Hurrelmann, 1990). Individuals who rated the importance of experiencing positive consequences as greater were hypothesized to report higher levels of alcohol use. Similarly, individuals who rated the importance of avoiding negative consequences as higher were hypothesized to report lower levels of alcohol use.

Hypothesis 7

Hypothesis. Observed gender differences in alcohol use will be

mediated by gender differences in importance ratings.

Rationale. This hypothesis examined whether the frequently observed differences between males and females in levels of alcohol use could be accounted for, at least in part, by gender differences in ratings of the importance of experiencing or avoiding drinking-related consequences. Females may 'binge' drink less often, on average, than males do, because they deem the consequences of this behaviour as less desirable (Bauman & Bryan, 1983). Following the demonstration of gender differences in alcohol use (Hypothesis 3) and in importance ratings (Hypothesis 4), the final step in examining gender differences was to examine the indirect effect of gender on alcohol use, through importance ratings.

Hypotheses about Longitudinal Relations

Hypothesis 8

Hypothesis. Importance ratings will predict changes in alcohol use. That is, importance ratings at Time 1 will be significantly related to alcohol use at Time 2, after first controlling for alcohol use at Time 1.

Rationale. See Hypothesis 6.

Hypothesis 9

Hypothesis. The frequency of experienced consequences will predict changes in ratings of the importance of experiencing/avoiding the consequences of drinking in the future. That is, experienced consequences at Time 2 were hypothesized to be an independent predictor of Time 2 importance ratings,

after controlling for Time 1 importance ratings.

Rationale. The developmental action perspective asserts that individuals evaluate the success or failure of their actions based on the consequences that result from those actions, and that changes in beliefs and goals should result from such re-evaluations (Brandtstädter, 1984; Chapman & Skinner, 1985). In other words, individuals have beliefs and goals that are assumed to shape behaviour (in the present context, alcohol use). These behaviours may lead to the experience of positive and/or negative consequences, and the evaluation of these consequences is hypothesized to lead to changes in beliefs and goals with respect to the future. Hypothesis 9 predicted that the experience of positive consequences of drinking would predict increases in the importance of experiencing these positive consequences in the future. In addition, the experience of negative consequences were hypothesized to predict increases in the importance of avoiding these consequences in the future. The direction of these hypothesized relationships was based on the premise that individuals are motivated to maximize pleasurable experiences and minimize unpleasurable ones.

Hypothesis 10

Hypothesis. Changes in importance ratings will predict changes in intentions to drink in the future.

Rationale. If drinking behaviour is motivated by the desire to experience positive consequences, and is limited by the desire to avoid negative

consequences, then when beliefs about the importance of experiencing or avoiding drinking-related consequences change, drinking intentions should also change. For example, if an individual rates the importance of experiencing Fun as a result of drinking more highly at Time 2 than at Time 1, that individual should also intend to drink more in the weeks following Time 2 than in the weeks following Time 1. Similarly, if an individual rates the importance of avoiding negative Physical consequences of drinking more highly at Time 2 than at Time 1, he or she should intend to drink less at Time 2 than at Time 1.

As a final note, it is important to state that the causal nature of the link between alcohol use and experienced consequences was beyond the realm of the present study. There is a debate in the literature regarding the relative contributions to behaviour made by pharmacological effects of alcohol ingestion versus expectancy effects (e.g., Hull & Bond, 1986; Falk, 1983; MacAndrew & Edgerton, 1969; MacAndrew & Garfinkel, 1962; Maisto, Connors, & Sachs, 1981; Marlatt & Rosenow, 1980). The present study acknowledges the potential importance of pharmacological, expectancy, situational, and cultural influences in shaping the nature and extent of experienced consequences of alcohol use. However, the focus here was on individual perceptions of the importance of experiencing consequences as a motivating factor for alcohol use, rather than on what causes individuals to experience (or to believe they have experienced) any particular consequence.

CHAPTER III

STUDY 1: SCALE CONSTRUCTION PHASE

METHOD

Participants

Students attending the University of Victoria participated in a study in which the purpose was to develop reliable scales measuring adolescents' and young adults' ratings of the importance of experiencing positive and avoiding negative consequences of drinking. All subjects were volunteers who did not receive any financial remuneration for their participation. A total of 130 completed surveys were received. Thirty-four cases were discarded because the individuals were older than 30 years of age, leaving a sample of 96 cases. The average age of these 96 subjects was 23.6 years (SD = 3.0). Sixty-two were female and 34 were male.

Procedure

Students attending psychology and engineering classes were invited by the researcher to participate in the study. Survey booklets were distributed to the participants in class. Interested students were asked to complete the surveys either in class or at home. The confidentiality and anonymity of responses were guaranteed. Each participant read and signed a consent form which was returned with the completed questionnaire. A return envelope was provided in which to seal the survey for confidentiality. Participants could return the envelopes directly to the researcher, to their instructor, or by campus mail. At

no time did the course instructors have access to individuals' confidential responses.

Measures

The goal of Study 1 was to develop reliable scales measuring: (a) past and future (planned) drinking behaviour; (b) opportunity to drink; and (c) importance of experiencing or avoiding multiple dimensions of consequences of alcohol use. Following is a description of the steps taken to develop and test these new measures.

Alcohol use. Four items measuring frequency and quantity of alcohol consumption were adapted from previous research (see Appendix A; Donovan, Costa, & Jessor, 1985; Donovan, Jessor, & Costa, 1991; Health & Welfare Canada, 1988). Subjects indicated how often in the past 12 months, on average: (a) they consumed any alcohol (Item 1): (b) they consumed 5 or more drinks on one occasion (Item 3); and (c) they got drunk (Item 4). They also indicated (d) how many drinks, on average, they consumed per occasion, in the past 12 months (Item 2). Prior to the questions on drinking, subjects were instructed to assume that one drink could consist of one glass of beer, one glass of wine, or one mixed drink. Possible responses to items 1, 3, and 4 ranged from 1 (indicating no alcohol use), to 8 (indicating daily use). Responses to item 2 ranged from 1 (no alcohol consumed) to 7 (consumed more than 12 drinks per drinking occasion). This item was recoded from 1 to 8 (by multiplying by 8/7) before being averaged with the other 3 items. In addition to the questions about

alcohol use in the past year, subjects also responded to the same 4 questions with respect to their '*plans or intentions to drink in the next 3 weeks*' (see Appendix A). To accommodate the shorter time period, possible responses to items 1, 3, and 4 ranged from 1 (indicating no alcohol use) to 6 (indicating daily use). Possible responses to Item 2 ranged from 1 to 7, as described above, thus Item 2 was recoded from 1 to 6 (by multiplying by 6/7) before being averaged with the other 3 items. The validity of self-reports of alcohol use has been demonstrated (e.g., Baer & Carney, 1993; Crowley, 1991; O'Hare, 1991; Sobell & Sobell, 1978).

Opportunity to drink. This measure lists five potential obstacles that could prevent individuals from drinking alcohol when they desired to do so (see Appendix B). Participants in Study 1 were asked how often, in the past 12 months, they had enough time to drink, had enough money to drink, had people to drink with, were able to acquire alcohol, and had a place to drink, when they wanted to. Responses ranged from *1 = None of the time* to *5 = All the time*. Thus, higher scores indicated more opportunity to drink.

Importance of consequences of drinking. Definitions of four positive and three negative consequences of drinking are presented in Table 1. Prior to Study 1, 87 items measuring these 7 domains were written by the researcher in consultation with 22 university students aged 30 years or younger. The purpose of consulting with other individuals was to collect reasons for drinking from different perspectives in order to better sample the possible domains. Ten

expert coders (5 male and 5 female psychology graduate students) coded the 87 items into the 7 categories based on the conceptual definitions in Table 1. Items receiving 70% or higher agreement by the coders were retained, leaving 78 items with an average agreement of 93.3%.

In Study 1, the 96 young adult subjects rated these 78 items according to 2 criteria: Importance and Probability. To measure importance, participants were asked, '*How important is it to you to experience*' each of the positive consequences '*when you drink?*', and '*How important is it to you to AVOID experiencing*' each of the negative consequences '*when you drink?*' (see Appendix C). Responses to both these questions ranged from *1 = Not at all important to me* through *5 = Very important to me*. Higher scores represented higher importance ascribed to experiencing positive consequences and to avoiding negative consequences. Second, participants were asked to rate the probability or likelihood that they would experience each of the positive and negative consequences of drinking if they drank a moderate amount of alcohol. Responses to this question ranged from *1 = Sure it would not happen to me* through *5 = Sure it would happen to me* (see Appendix D). Higher scores therefore indicated that participants thought a consequence was more likely to occur.

CHAPTER IV

STUDY 1: SCALE CONSTRUCTION PHASE

RESULTS

Alcohol Use

Table 3 presents descriptive information about the scales measuring alcohol use in the previous 12 months and planned alcohol use in the following 3 weeks. Cronbach's coefficient alphas for the 4-item past and future measures of alcohol use were .89 and .86, respectively. These two measures were highly correlated, $r = .83$, $p < .001$, indicating high stability of alcohol use across the two time periods measured. A wide range of levels of alcohol use were reported. Examination of the individual items showed that in the past year, 18.8% of subjects drank once a month or less, 40.6% of subjects drank 2 to 4 times per month, and 34.3% of subjects drank 2 to 6 times per week. Subjects reported drinking, on average, 2 or 3 drinks per occasion. With respect to heavy drinking, 64.2% reported drinking 5 or more drinks on at least one occasion in the last year, and 21.1% reported doing so more often than once a month. Many subjects reported having been drunk: 66.7% were drunk at least once in the preceding year, and 18.8% were drunk more often than once a month. Thus, participants in the scale construction sample demonstrated variability with respect to their drinking behaviour.

Insert Table 3 about here

Opportunity to Drink

Descriptive information about participants' opportunity to drink is presented in Table 3. Cronbach's coefficient alpha was .81, indicating adequate internal consistency of the 5-item scale. The mean was relatively high (3.97 on a 5-point scale), indicating that, on average, participants felt that most of the time they were able to drink when they wanted to. Opportunity to drink was significantly related to past and future drinking, r's = .27, $p < .01$, and .18, $p < .05$, respectively, indicating that individuals who had fewer obstacles to drinking drank somewhat more than those with more obstacles.

Importance of Consequences of Drinking

Item selection. To assess the internal consistency of the importance ratings of the seven categories of drinking consequences (Hypothesis 1), Cronbach's coefficient alpha and item-total correlations were computed for each category. The results of these analyses along with the means and standard deviations are presented in Table 4. All of the internal consistency estimates for the initial 78-item version were high (range = .87 to .96). The corrected item-total correlations (correlations between each item's score and the scale scores of the other items in the set) were also examined, with the aim of eliminating any items whose corrected item-total correlation was below .15. All were above .35 (range = .36 to .89); therefore no items were dropped at this stage.

Insert Table 4 about here

The general goal was to select the best items assessing each category, with approximately 8 items per category and 60 or fewer items in total. A shorter number of items was desired in order to reduce the time required for participants to complete the survey. Decisions regarding which items to retain were made by simultaneously considering the following criteria:

1. Items with higher means and standard deviations were preferred, because they indicated subjects viewed the consequences as important and/or probable, and that there was inter-subject variability on that item.

2. Items that had lower correlations with other category scores were preferred. Since intercorrelations within the positive consequences and within the negative consequences were much higher than intercorrelations between the positive and negative categories of consequences, priority was given to choosing items that would minimize the correlations within the sets of positive and negative consequences, respectively.

3. Dropping items must not cause the internal consistency estimates to become too low. The alphas for each subscale should remain over .80, preferably higher.

In all, 28 items were dropped, resulting in a final 50-item scale measuring 7 categories of consequences of drinking (see Appendix D). Twenty-six items

measured the 4 positive consequences, and 24 items assessed the 3 negative consequences. The means, standard deviations, and internal consistency estimates of the 7 shortened category scores are presented in Table 5. As desired, the alphas all remained high (range = .83 to .92), despite the reduction in the number of items.

Insert Table 5 about here

Relations among the categories of consequences. To examine the relationships among the subscales, intercorrelations among the importance ratings of the seven categories of consequences were computed (see Table 6). Scores on the positive and negative importance ratings were relatively independent of each other (median r = -.11, NS). However, there were moderate to high correlations among the positive importance ratings (median r = .50, $p < .01$) and among the negative importance ratings (median r = .69, $p < .001$), indicating a substantial amount of overlap between them.

Insert Table 6 about here

A principle components analysis (PCA) with varimax rotation of the 7 importance ratings confirmed the existence of 2 independent components. The 3 negative categories loaded highly on the first component (range of loadings = .83 to .94), and the 4 positive categories loaded highly on the second component

(range of loadings = .64 to .88). A total of 70.4% of the variance in importance ratings was explained by these 2 components.

Relationship with alcohol use. To assess the relationship of importance ratings with levels of alcohol use during the previous 12 months and upcoming 3 weeks (Hypothesis 2a), correlations and multiple regressions were performed. The correlations are presented in Table 7. For the positive importance ratings, the expected pattern of correlations was found. Alcohol use was positively related to three of the four positive consequences. The exception was Image/Reputation, which was not significantly related to past or future drinking. Importance ratings of the negative consequences were not consistently related to alcohol use. Only the Physical effects category evidenced a significant relationship with drinking in the past 12 months. The results of the multiple regressions showed that 39% to 40% of the variance in alcohol use was accounted for by the set of predictors. This percentage of variance explained was larger than that observed in previous research measuring expectancies about the effects of alcohol (cf., Leigh, 1989b). As described above, the positive and negative importance ratings were quite highly intercorrelated. Therefore, it was not surprising that fewer of the individual categories made significant unique contributions to the prediction of alcohol use. Specifically, the standardized betas showed that the importance of Fun, Peer Experience, and Driving-Related consequences uniquely predicted planned alcohol use, and the importance of Relaxation/Coping and Image/Reputation uniquely predicted alcohol use in the

previous 12 months.

Insert Table 7 about here

Unweighted versus weighted importance ratings. The purpose of measuring probability in addition to importance was to determine whether weighting importance ratings by probability assessments would improve the prediction of drinking behaviour, as some authors have argued for desirability and probability (Hypothesis 2b; cf., Ajzen, 1985; Bauman et al., 1985; Critchlow, 1987). Thus, the importance ratings were multiplied by their respective probability items and the resulting products were averaged to form a weighted importance rating for each category of consequences. (Deviation scores were used to reduce multicollinearity in the subsequent multiple regression analyses; Aiken & West, 1991). These weighted importance scores, in effect, give more weight to consequences each subject judges as more likely to occur and less weight to consequences deemed unlikely.

Examination of Cronbach's coefficient alpha showed that the internal consistencies of the unweighted ratings (range = .83 to .92) were higher than those of the weighted importance ratings (range = .67 to .87; see Table 5). Thus, the weighted ratings provided a more reliable index of beliefs about importance. Next, correlations and multiple regressions were computed to examine the relationship of the weighted importance ratings with the two

measures of alcohol use. The same analytic strategy was used as with the unweighted importance ratings. None of the bivariate correlations were significant (see Table 8). In addition, the multivariate and univariate multiple regressions demonstrated no significant relationships. Thus, it was decided to use the unweighted importance ratings in Study 2.

Insert Table 8 about here

Summary and Conclusions

The measures of alcohol use and opportunity to drink evidenced adequate reliability. A 50-item measure of the importance of experiencing four positive and avoiding three negative consequences of drinking was developed. Content validity was established by expert raters' coding of the items into the seven categories based on conceptual definitions. The internal consistency of the seven scales was demonstrated using Cronbach's coefficient alpha, and principle components analyses showed the existence of two independent factors (importance of experiencing positive consequences and importance of avoiding negative consequences). The prediction of 40% of the variance in alcohol use by the seven importance ratings demonstrated the concurrent validity of these new measures, an improvement over previously existing scales measuring alcohol expectancies (Leigh, 1989b). Moreover, it was shown that weighting the importance ratings by subjects' assessments of the probability of experiencing the

seven categories of consequences did not improve the internal consistency of the scales, nor did it improve the prediction of alcohol use. Thus, Study 2 used unweighted importance ratings.

CHAPTER V

STUDY 2: DRINKING AND SOCIAL BEHAVIOUR SURVEY

METHOD

Participants

Participants were 344 students living in on-campus residences at the University of Victoria (a medium-sized Canadian university). Based on summaries completed by the resident advisors who distributed and collected the surveys, the estimated response rate at Time 1 was 78.5%. Criteria for inclusion in the analyses were that subjects had graduated from high school in the previous 5 years, had completed 3 or fewer years of college or university study, were aged 23 or younger, and had lived in North America for at least 3 years. The first 3 criteria were adopted in order to obtain the targeted sample of late adolescents. The criterion of 3 years residency in North America was employed because there were too few recently-arrived international students to analyze for cultural differences in the pattern of relationships. A total of 356 students returned completed questionnaires at Time 1; 12 participants were dropped for not meeting one or more of the four criteria, which left a sample size of 344.

The sample included 222 females and 122 males. The mean age of the 344 subjects at Time 1 was 18.67 years (SD = 1.02). Seventy-four percent of the subjects were younger than the provincial drinking age of 19 years. However, participants reported experiencing relatively few obstacles to drinking in the previous three weeks. That is, the mean on the 5-point opportunity to drink

scale was 3.86 (SD = .93), indicating that on average, subjects were able to drink when they wanted to some (3) or most (4) of the time. Ninety percent had graduated from high school in the preceding 15 months. With respect to their level in university, 81.4% were in their first year, 13.4% were in second year, and 5.3% were in third or fourth year.

Prior to moving away from home, 79.7% of the participants lived with their mother and father, 9.7% lived with their mother only, 5.0% lived with their mother and stepfather, 2.4% lived with their father only, 1.8% lived with their father and stepmother, and 1.5% percent lived with individuals who did not fall into these categories. The average level of education of the participants' fathers was 14.95 years (SD = 3.34). Participants' mothers had completed an average of 14.30 years of education (SD = 2.89). Among fathers, 54.6% had completed 4 or more years of post-secondary education; among mothers, this figure was 41.2%.

Three weeks after the primary data collection, a follow-up survey was distributed, and 235 surveys were returned. In order to maintain the anonymity of the research participants, subject lists matching names with survey identification numbers were not kept. Instead, cases were matched between the two times of measurement using self-reported demographic information (gender, birthdate, building, and room number). Using this method, 169 cases were successfully matched between the two times of measurement. Eight cases were not matched because participants did not provide adequate demographic

information at Time 2. However, the majority of unmatched cases (n = 58) were new subjects who had not participated at Time 1. Of the 169 matched cases, 121 were female and 48 were male. The average age of these participants was 18.58 years (SD = .89).

Procedure

Participants were initially invited to participate in the Drinking and Social Behaviour Survey through an advertisement printed in the September issue of the university's Housing Services newsletter (see Appendix E). This newsletter is distributed to all students living in university residences as they arrive on campus for the Fall semester. The two residence complexes housing first-year students were targeted. Residence advisors (Ras; senior students employed by the university) distributed the surveys at floor meetings during the first week of classes and again three weeks later. The Ras explained the purpose and procedure of the survey to the students, and posted an information sheet in a public place that provided answers to questions about the survey (see Appendix F). In addition, an explanation of the purpose of the survey, the procedure, and the confidentiality of responses was printed on the cover of each survey. Students who had questions were encouraged to ask their RA or to contact the researcher by phone or in person.

All responses to the two surveys were anonymous and confidential. Because the survey included questions about alcohol consumption and the majority of respondents were under the legal drinking age, extra care was taken

to assure participants that no one but the researcher would see the completed surveys, and that names would not be matched with surveys using identification numbers or subject lists. Each survey was distributed with a consent form and a return envelope. Participants were asked to read and sign the consent form, complete the survey, and seal both inside the return envelope. Once completed, participants returned the sealed envelopes to their Ras, who returned the envelopes unopened to the Housing Office. The surveys were then picked up by the researcher. The Ras were asked to complete a summary sheet documenting how many surveys they had distributed and how many were collected. The information provided on these summary sheets was used to compute the response rate. As soon as the envelopes were opened, the surveys and consent forms were separated. Identification numbers were placed on the surveys only, thereby guaranteeing that names and surveys could not be matched.

Measures

Demographic and situational variables. Several questions assessed participants' demographics and current living situations. Participants indicated: (a) their birthdate; (b) whether their residence complex was designated academic or social (academic residences have more quiet hours on weekdays); (c) whether they had a roommate; (d) the highest grade or year in school their mothers and fathers had completed; and (e) their opportunity to drink in the previous three weeks. This last variable was measured by the 5-item opportunity to drink scale developed in Study 1. Cronbach's coefficient alpha in Study 2 was .81 and .78 at

Times 1 and 2, respectively. This set of demographic and situational variables was measured in order to assess whether importance ratings and levels of alcohol use differed by general demographic indicators. Where robust relationships were found, the variable in question was used as a covariate in subsequent analyses.

Alcohol use. The 4 questions described in Study 1 were used at Time 1 in Study 2 to measure participants' use of alcohol in the previous 12 months and the previous 3 weeks, as well as their plans to drink in the upcoming 3 weeks (see Appendix A). At Time 2, the questions referring to the use of alcohol in the previous 3 weeks and the following 3 weeks were repeated. The same response format was used as in Study 1. Internal consistency estimates from the Study 2 sample are presented in Table 9. All of these alphas were above .90 (range = .91 to .94), indicating high internal consistency.

Insert Table 9 about here

Importance of consequences of drinking. The 50-item importance of consequences of drinking scale developed in Study 1 was used to assess participants' ratings of the importance of experiencing seven categories of drinking consequences at Times 1 and 2 (see Appendix C). Four subscales measured positive consequences: Fun, Peer Experience, Relaxation/Coping, and Image/Reputation (see Table 1 for conceptual definitions). Participants were

asked, "*How important is it to you to experience*" the 26 items measuring these positive consequences "*when you drink?*". Three subscales measured negative consequences: Physical, Behavioural, and Driving-related consequences (see Table 1). Participants were asked, "*How important is it to you to AVOID experiencing*" the 24 items measuring the negative consequences "*when you drink?*". Responses to both these questions ranged from *1 = Not at all important to me* to *5 = Very important to me*. Internal consistency estimates for the 7 subscales among the Study 2 sample are presented in Table 10. As in Study 1, the coefficient alphas at both times of measurement were all .85 or above (range = .85 to .93), indicating high internal consistency.

Insert Table 10 about here

Experienced consequences of drinking. In Study 2, participants also rated how often they had experienced each of the 50 consequences as a result of drinking in the 3 weeks preceding Times 1 and 2 (see Appendix G). Items measuring positive and negative consequences were presented in a random order. The possible responses were on a 5-point scale ranging from *0 = Never happened* to *4 = Happened 4 or more times in past 3 weeks*. Cronbach's coefficient alpha for the 7 categories are presented in Table 10. All were .85 or above (range = .85 to .95), with the exception of Driving-related consequences, which had an alpha of .61 and .53 at Times 1 and 2, respectively. This low alpha

may, in part, be attributable to the lack of variability in this variable, rather than heterogeneity of the Driving-related items. That is, at Times 1 and 2, Driving-related consequences had a lower mean and standard deviation than the other six consequences. Driving-related consequences may have been particularly infrequent for the Drinking and Social Behaviour Survey participants because: (a) all lived in on-campus housing, close to many possible friends and social gatherings; and (b) almost three-quarters were too young to drink legally in clubs or restaurants. Both of these reasons would encourage drinking close to home, thereby reducing the need to drive.

Individuals who drink more often and in greater quantities should report experiencing a higher level of consequences of drinking (both positive and negative). Thus, as an indicator of concurrent validity, correlations were computed between the seven experienced consequences variables and levels of alcohol use during the corresponding time periods. These correlations were all large and positive (median r = .70, range = .53 to .85, all $p < .001$).

Analyses of Missing Cases

As explained previously, a total of 169 cases at Time 2 were successfully matched with Time 1 data. In order to determine whether the participants for whom longitudinal data were obtained differed with participants for whom data were only available at Time 1 (i.e., whether cases were missing at random), the following analyses were performed. First, t tests were computed comparing the longitudinal sample (n = 169) with the drop-outs (n = 175) on Time 1

demographic and situational variables (fathers' and mothers' education, age, roommate/single room, complex in residence). None of these were significant (all $p > .05$). Second, a one-way MANOVA was performed comparing the two groups on the seven importance subscales at Time 1. The multivariate effect was not significant, Pillais = .02, F (7, 315) = 1.13, NS. Third, a one-way MANOVA was performed comparing the two groups on the three drinking variables at Time 1. Again, the multivariate effect was not significant, Pillais = .02, F (3, 340) = 1.87, NS. Finally, a similar one-way MANOVA was performed on the seven experienced consequences of drinking at Time 1. This multivariate effect was also not significant, Pillais = .03, F (7, 324) = 1.43, NS. Thus, it was concluded that although there was considerable attrition between Times 1 and 2, the participants who remained in the study did not appear to differ systematically from those who dropped out.

CHAPTER VI

STUDY 2: DRINKING AND SOCIAL BEHAVIOUR SURVEY

CONCURRENT RESULTS

Description of the Variables

Alcohol use. Table 11 presents the means and standard deviations of alcohol use during the previous 12 months, previous 3 weeks, and planned use in the upcoming 3 weeks. This information is presented in more detail in Tables 12 through 15 in the form of frequencies of the items that make up the three drinking variables. An inspection of Table 12 shows that only 6.3% of participants reported never having consumed any alcohol in the preceding 12 months. The majority of participants (75.0%) consumed alcohol once a week or less, while the remaining 18.8% consumed alcohol 2 or more times per week. Two-thirds of participants reported getting drunk on at least one occasion in the previous year. Approximately 27% reported getting drunk between one and four times per month in the preceding year. Table 13 shows the number of drinks consumed per average drinking occasion. Approximately 15.7% of respondents drank an average of 1 drink per occasion, 23% drank 2 or 3 drinks per occasion, and an additional 33% drank 4 to 6 drinks per occasion. Finally, 18% drank 7 or more drinks per average drinking occasion in the preceding 12 months.

Insert Tables 11, 12, and 13 about here

The frequency and quantity of drinking in the 3 weeks preceding and following Time 1 are presented in Tables 14 and 15. Almost a quarter of participants reported not consuming any alcohol in the 3 weeks preceding the survey. Almost 55% reported consuming alcohol on 1 to 3 days in the preceding 3 weeks, and 21.8% drank 2 to 6 days per week. Almost half reported getting drunk at least once in the preceding 3 weeks. Most of these individuals did so on 1 and 3 days in 3 weeks. The frequencies for planned alcohol use in the upcoming 3 weeks were very similar.

Insert Table 14 and 15 about here

Importance of consequences of drinking. Table 16 presents the means and standard deviations of importance ratings at Time 1 for females and males together and separately. These means are also illustrated in Figure 1. On average, the participants believed that it was of little to medium importance to experience the four positive consequences when they drank alcohol. On the other hand, participants rated the three negative consequences as of medium or greater importance to avoid when drinking. The significance of Gender and Category differences in importance ratings will be addressed in the mean-level analyses.

Insert Table 16 and Figure 1 about here

Intercorrelations among the importance subscales are presented in Table 17. As in Study 1, there were large correlations among the four positive importance ratings (median r = .56), and among the three negative importance ratings (median r = .53). A principle components analysis with varimax rotation on the seven subscales replicated the two-factor structure found in Study 1 (see Table 17). That is, the four positive consequences loaded highly on the first factor (range of loadings = .72 to .91), and the three negative consequences loaded highly on the second (range of loadings = .79 to .88). The two factors together accounted for 72.5% of the variance in importance ratings.

Insert Table 17 about here

Experienced consequences of drinking. Table 18 presents the means and standard deviations of participants' experience of the seven categories of consequences of drinking. These means are also presented in Figure 2. An inspection of this table shows that the full sample of males and females, on average, experienced each of the Fun and Peer Experience consequences between one and two times in the preceding three weeks. The other consequences were experienced, on average, fewer than once. Although these figures appear low, it should be noted that these values represent averages across the items in each subscale. For example, the mean of .49 on the 10-item physical consequences subscale indicates that, on average, participants

experienced about 5 Physical consequences of drinking in the preceding 3 weeks.

Insert Table 18 and Figure 2 about here

Analysis of Potential Covariates

In order to determine whether importance or alcohol use variables were related to major demographic and situational variables, correlations were computed. These demographic and situational variables were: (a) the education of the subjects' fathers; (b) the education of the subjects' mothers; (c) subjects' age; (d) their complex in residence (academic versus social orientation; academic residences have earlier quiet hours on weekdays); (e) whether they had a roommate; and (f) their opportunity to drink. With the exception of opportunity to drink, the relationships of the remaining variables with importance ratings and levels of alcohol use were minimal. That is, only 6 of the 50 correlations were significant, and the magnitude of all the correlations was small (see Table 19). However, 8 of the 10 correlations of opportunity to drink with importance ratings and levels of alcohol use were significant. Individuals who reported having more opportunity to drink: (a) rated the importance of experiencing Fun, Peer Experience, and Relaxation/Coping consequences as higher; (b) rated the importance of avoiding Physical and Behavioural consequences as lower; and (c) reported higher levels of alcohol use. Thus, opportunity to drink was used as a covariate in subsequent analyses.

Insert Table 19 about here

Mean-Level Analyses

The first set of analyses were descriptive, examining gender differences in levels of alcohol use (Hypothesis 3) and gender and category (i.e., positive vs. negative) differences in importance ratings and experienced consequences (Hypotheses 4 and 5). This primary description of group differences in the three sets of measured constructs was necessary before moving on to the more explanatory analyses examining their concurrent and longitudinal relationships.

Gender differences in alcohol use. To examine gender differences in levels of alcohol use (Hypothesis 3), a one-way multivariate analysis of variance (MANOVA) was performed. Gender was a between-subjects factor and the 3 measures of alcohol use were the dependent variables (drinking during the previous 12 months, the previous 3 weeks, and the upcoming 3 weeks). The results of this analysis showed a significant multivariate effect for Gender, Pillais = .05, F (3, 340) = 6.07, $p < .001$. The univariate tests showed that, compared to females, males drank more in the previous 12 months, F (1, 342) = 9.36, $p < .01$, and in the previous 3 weeks, F (1, 342) = 17.15, $p < .001$. Males also planned to drink more in the upcoming 3 weeks than did females, F (1, 342) = 14.86, $p < .001$. (Means are presented in Table 11.) When this analysis was re-computed with the addition of opportunity to drink as a covariate, the results did

not differ. Subsequent analyses on the items representing frequency and quantity of drinking (Items 1 and 2, respectively) showed that males drank more frequently and in greater quantities during all three time periods measured.

Gender and category differences in importance ratings. Hypothesis 4 asserted that males would have higher positive importance ratings than females; females would have higher negative importance ratings than males. To evaluate this hypothesis, a 2 X 2 (Gender X Type of Category) ANOVA was performed. Gender was a between-subjects factor, and Type of Category was a within-subjects factor contrasting the mean of the positive importance ratings with the mean of the negative importance ratings. Figure 3 plots these means. The results yielded significant main effects of Gender, F (1, 323) = 5.50, $p < .05$, and Type, F (1, 323) = 531.34, $p < .001$. There was also a significant Gender X Type of Category interaction, F (1, 323) = 27.59, $p < .001$. The nature of this interaction was as hypothesized: males rated the positive consequences as more important to experience and the negative consequences as less important to avoid than did females, Tukey's test, all $p < .01$. These results did not differ with the addition of opportunity to drink as a covariate.

Insert Figure 3 about here

Gender and category differences in experienced consequences. Participants also indicated how often they had actually experienced the seven

categories of consequences as a result of drinking in the previous three weeks (see Table 18 and Figure 2). Hypothesis 5 predicted that participants would experience a higher level of positive consequences relative to negative consequences, and that males would experience a higher level of consequences overall. To evaluate this hypothesis, a 2 X 2 (Gender X Type of Category) ANOVA was performed. Gender was a between-subjects factor, and Type of Category was a within-subjects factor contrasting the mean of the positive experienced consequences with the mean of the negative experienced consequences. Figure 4 plots these means. There was a significant effect of Gender, F (1, 331) = 18.02, $p < .001$, indicating that males experienced a higher level of consequences of drinking than did females. There was also a significant effect of Type of Category, F (1, 331) = 334.23, $p < .001$, indicating that a higher level of positive consequences was experienced relative to negative consequences. Finally, there was a significant Gender X Type of Category interaction, F (1, 331) = 12.52, $p < .001$. Post hoc tests indicated that although both males and females experienced a higher level of positive consequences relative to negative consequences, the difference was larger for males, Tukey's test, all $p < .01$. These results did not differ with the addition of opportunity to drink as a covariate.

Insert Figure 4 about here

Correlational Analyses

The hypotheses tested in the following sections follow from a developmental action perspective applied to alcohol use (e.g., Chapman & Skinner, 1985; Silbereisen & Eyferth, 1986). Individuals were hypothesized to coordinate their drinking behaviour in accordance with their beliefs about the importance of experiencing positive and avoiding negative consequences of drinking.

Prediction of alcohol use from importance ratings. Hypothesis 6 asserted that positive and negative importance ratings would predict levels of alcohol use concurrently. To test this hypothesis, first correlations examined the bivariate relationships between the seven importance ratings and the three measures of alcohol use. Second, multiple regressions were performed predicting alcohol use from ratings of the importance of experiencing positive consequences and avoiding negative consequences. Table 20 shows the bivariate correlations between the 7 importance ratings and the measures of alcohol use in the previous 12 months, previous 3 weeks, and upcoming 3 weeks. All the correlations were significant and in the predicted direction. That is, ratings of the importance of experiencing positive consequences were positively related to the 3 measures of alcohol use, and ratings of the importance of avoiding the negative consequences were negatively related to alcohol use.

Insert Table 20 about here

In order to examine the extent to which the importance ratings as a group predicted alcohol use, a multivariate multiple regression was performed with the three measures of alcohol use as the criterion variables. The predictors were importance ratings of the four positive and three negative consequences. The results of this analysis showed a significant relationship between the set of predictors and the set of criterion variables, multivariate $\underline{R}^2 = .53$, $\underline{p} < .001$ (see Table 20). Thus, a separate multiple regression was performed for each of the criterion variables. Because there was no substantive reason to enter the predictors in any pre-specified order, the unique contributions of the set of positive importance ratings and the set of negative importance ratings were evaluated using a simultaneous set-wise regression.

The results are presented in Table 20. Significant amounts of variance were explained by the total set of predictors in all three equations, $\underline{R}^2 = .39$ to .45, all $\underline{p} < .001$. Importance ratings of the four positive consequences together accounted for 21% to 26% of the variance in levels of alcohol use, independent of the importance of avoiding negative consequences. The importance of experiencing Fun, Peer Experience, and Relaxation/Coping consequences were significant predictors of alcohol use in two or more of the three equations. The importance of experiencing Image/Reputation consequences did not make a

unique contribution to any equation. Importance ratings of the three negative consequences together accounted for 3% to 4% of the variance in alcohol use, independent of the importance of experiencing positive consequences. The importance of avoiding Physical and Behavioural consequences each made a unique contribution to one of the three equations, but Driving-Related consequences was not a significant predictor in any equation. All significant relationships were in the predicted directions. These relationships did not change when opportunity to drink was added as a covariate to the analyses. Thus, Hypothesis 6 was confirmed. That is, ratings of the importance of experiencing positive consequences and of avoiding negative consequences each evidenced significant relationships with levels of alcohol use across the three time periods.

Indirect effects of gender on alcohol use. The previous mean-level analyses established that males and females differed both in their ratings of the importance of experiencing and avoiding consequences of drinking (Hypothesis 4) and in their levels of alcohol use (Hypothesis 3). Importance ratings were also shown to be significantly related to alcohol use (Hypothesis 6). The next set of analyses tested for the presence of indirect effects of gender on alcohol use, through the importance ratings (Hypothesis 7). That is, these analyses tested whether gender differences in alcohol consumption were mediated by gender differences in importance ratings. Females may tend to binge drink less often than males do because it is less important to them to experience positive

drinking consequences and more important to avoid negative drinking consequences than do males. In other words, importance ratings may mediate the relationships between gender and alcohol use.

To test this mediational hypothesis, a series of regressions were performed (cf. Baron & Kenny, 1986). The independent variable was gender, the two mediating variables were positive importance ratings (mean of importance ratings on the four positive consequences subscales) and negative importance ratings (mean of importance ratings on the three negative consequences subscales), and the dependent variable was alcohol use (mean of drinking in the three weeks preceding and three weeks following Time 1).

Following the method outlined by Baron and Kenny (1986), the following three regressions were performed: (1) alcohol use (dependent variable) was regressed on gender (independent variable); (2) the positive and negative importance ratings (mediators) were regressed on gender; and (3) alcohol use was regressed on gender, positive importance, and negative importance. Evidence for the mediational hypothesis would be the following: (1) the effect of gender on alcohol use in the first equation should be significant; (2) the effect of gender on positive and negative importance in the second equation should be significant; and (3) the effect of positive and negative importance on alcohol use in the third equation should be significant. If these three conditions are upheld and are in the predicted directions, the effect of gender on alcohol use should be less in the third equation than in the second. The strongest support for a

mediational hypothesis would be if the effect of gender on alcohol use was reduced to zero when the mediators were also entered into the equation.

The results of these three regressions are summarized in Figure 5. Path diagram A shows the effect of gender on alcohol use, t (1, 323) = 4.79, $p < .001$. Path diagram B shows the direct effects of gender on positive and negative importance, t (1, 323) = 2.84, $p < .01$, and t (1, 323) = -5.89, $p < .001$, respectively. Path diagram B also presents the direct effects of positive and negative importance on alcohol use, t (1, 321) = 12.00, $p < .001$ and t (1, 321) = -3.53, $p < .001$, respectively. A comparison of the two path diagrams showed that although the path coefficient showing the relationship of gender and alcohol use appeared to be smaller in diagram B, it was not reduced to zero, indicating that the mediation was not perfect.

Insert Figure 5 about here

Next, the significance of the indirect effects of gender on alcohol use through positive and negative importance was computed using the formula for the standard errors of indirect effects provided by Baron and Kenny (1986). The indirect effect of gender on alcohol use through positive importance was significant, t (1, 321) = 2.75, $p < .01$. The indirect effect through negative importance was also significant, t (1, 321) = 2.99, $p < .01$. These analyses provided support for the mediational hypothesis. That is, there was evidence for

an indirect effect of gender on alcohol use through positive and through negative importance ratings.

CHAPTER VII

STUDY 2; DRINKING AND SOCIAL BEHAVIOUR SURVEY

LONGITUDINAL RESULTS

Description of the Variables at Time 2

Means and standard deviations for alcohol use in the three weeks preceding and following (intended) Time 2 are presented in Table 21. Tables 22 and 23 present this information in more detail. The frequency and quantity of alcohol use was very similar to that reported at Time 1. Almost 3/4 of participants consumed some alcohol in the preceding three weeks, and almost 1/2 reported drinking 5 or more drinks and/or getting drunk on at least one occasion. Almost 53% drank on 1 to 3 days in the preceding 3 weeks, and 16% drank 2 to 7 days per week. Participants' intentions to drink in the upcoming 3 weeks showed very similar patterns. Table 23 summarizes the quantity of alcohol consumed per average drinking occasion in the previous 3 weeks. Among drinkers, the most common quantities of alcohol consumed per occasion were 2 to 3 drinks (32.8%) or 4 to 6 drinks (33.6%). Almost 1/4 of drinkers reported drinking 7 or more drinks per average drinking occasion. Intentions to drink in the upcoming 3 weeks showed a very similar pattern.

Insert Table 21, 22, and 23 about here

The means and standard deviations for importance ratings at Time 2 are presented for males and females separately and together in Table 24. On

average, participants rated the positive consequences as of little to medium importance to experience as a result of drinking, whereas negative consequences were rated as of medium to high importance. Table 25 presents the intercorrelations among the seven importance subscales. A similar pattern was observed as in Study 1 (Scale Construction Phase) and in Study 2, Time 1. That is, the correlations among the positive categories of consequences were large (range = .51 to .84), as were the correlations among the negative categories of consequences (range = .52 to .83). There were also small to moderate negative correlations between the importance ratings of positive and negative categories (range = -.13 to -.46). A principle components analysis with varimax rotation on the seven subscales again replicated the two-factor solution found in Study 1 and in Study 2, Time 1. That is, the four positive consequences demonstrated high factor loadings of the first factor (range of loadings = .71 to .89), and the three negative consequences loaded highly on the second factor (range of loadings = .78 to .88). Together, the two factors predicted 72.4% of the variance in importance ratings. Finally, the means and standard deviations of experienced consequences of drinking are presented in Table 26. As at Time 1, the most commonly experienced consequences were Fun and Peer Experience.

Insert Tables 24, 25, and 26 about here

Mean-level Change Analyses

The final set of preliminary analyses for the longitudinal sample examined

whether there were changes between Times 1 and 2 in the mean levels of alcohol use, importance ratings, and experienced consequences. The purpose of these analyses was to determine whether these variables increased or decreased during the interval between the two times of measurement. The analyses had the same design as the mean-level analyses in Chapter 6 involving these variables, with the addition of a two-level Time factor, both as a main effect and in interaction with the other factors. No mean-level Time differences were hypothesized due to the brief (three-week) interval.

Alcohol use. A 2 X 2 (Sex X Time) MANOVA was performed with drinking in the previous three weeks and intentions to drink in the upcoming three weeks as the dependent variables. (Drinking in the past 12 months was collected only at Time 1.) There was a significant main effect for Time, Pillais = .05, F (2, 166) = 4.10, $p < .05$. The univariate tests showed that alcohol use was greater in the three weeks preceding Time 2 than in the three weeks preceding Time 1, F (1, 167) = 7.50, $p < .01$. Intentions to drink in the upcoming three weeks did not differ between Times 1 and 2, F (1, 167) = .57, NS. There was also a significant interaction between Sex and Time, Pillais = .05, F (2, 166) = 4.13, $p < .05$. Univariate tests showed that this interaction existed for alcohol use in the three weeks preceding the two times of measurement, F (1, 167) = 7.83, $p < .01$, and not for intentions to drink, F (1, 167) = .35, NS. Post hoc tests showed that females drank more at Time 2 than at Time 1, whereas males' alcohol use did not differ between the two times of measurement.

Importance ratings. To examine whether the mean level of importance ratings changed between the two times of measurement, a 2 X 7 X 2 (Sex X Category X Time) ANOVA was performed, with importance ratings as the dependent variable. Category was a within-subjects factor comparing the seven categories of consequences. Time was also a within-subjects factor. Neither the main effect for Time nor the interactions of Time with the other factors were significant.

Experienced consequences. To examine time differences in the frequency with which participants experienced consequences of drinking, three analyses were performed. First, a 2 X 7 X 2 (Sex X Category X Time) ANOVA was performed with the experienced consequences as the dependent variable. Category was a within-subjects factor comparing the seven categories of consequences. Time was also a within-subjects factor. Neither the main effect of Time nor the interaction of Time with the other factors were significant.

Correlational Analyses

Prediction of changes in alcohol use from Time 1 importance ratings. A series of analyses examined the extent to which ratings of the importance of experiencing or avoiding drinking-related consequences predicted subsequent changes in drinking behaviour (Hypothesis 8). First, correlations were computed between the importance ratings at Time 1 and levels of alcohol use at Time 2. Second, multiple regressions were performed predicting Time 2 alcohol use from importance ratings at Time 1, controlling for Time 1 alcohol use. The

correlations indicated the bivariate relationships of importance ratings and subsequent alcohol use, and the regressions examined the overall prediction of change in alcohol use from the set of predictors.

Table 27 shows the bivariate correlations of the Time 1 alcohol use and Time 1 importance ratings with Time 2 alcohol use. The correlations between Times 1 and 2 alcohol use showed a high degree of rank-order stability across the 3 weeks. With respect to the relationship between the Time 1 positive importance ratings and Time 2 alcohol use, all the correlations were significant and positive, as hypothesized. That is, individuals who at Time 1 believed it was more important to experience the four positive consequences of drinking reported higher levels of alcohol use at Time 2. With respect to the negative consequences, Time 1 ratings of the importance of avoiding Physical and Behavioural consequences of drinking were negatively related to Time 2 alcohol use, as hypothesized. Time 1 ratings of the importance of avoiding Driving-Related consequences were not significantly related to subsequent drinking behaviour.

Insert Table 27 about here

Next, a multivariate multiple regression was performed in order to examine the extent to which the Time 1 importance ratings as a group predicted Time 2 alcohol use. As was the case in the concurrent analyses reported in Chapter 6, the predictors were the Time 1 importance ratings of the four positive and three

negative consequences. The criterion variables were alcohol use in the three weeks preceding and the three weeks following Time 2. There was a significant multivariate association between the set of predictors and the set of criterion variables, multivariate $\underline{R}^2 = .48$, $\underline{p} < .001$ (see Table 27). Thus, a separate multiple regression was computed for each of the criterion variables. On the first step, Time 1 alcohol use was entered. On the second step, the Time 1 importance ratings were entered. As with the concurrent analyses reported in Chapter VI, the four positive and three negative importance ratings were analyzed as a simultaneous set-wise regression examining the unique contribution of each set to the prediction of changes in alcohol use.

Table 27 presents the results of these analyses. Time 1 alcohol use accounted for a large percentage of the variance in Time 2 alcohol use, $\underline{R}^2 = .40$ and .59, both $\underline{p} < .001$, for the two measures of drinking behaviour. Beyond this stability, the positive and negative importance ratings each predicted an additional 3% to 5% of the variance in Time 2 alcohol use, $\underline{p} < .05$. Although the large intercorrelations among the importance ratings make the betas difficult to interpret, it can be noted that Fun, Relaxation/Coping, and Behavioural consequences each made a significant unique contribution to one of the equations. All significant relationships were in the predicted directions. The observed pattern of relationships did not change when opportunity to drink was added as covariate to the analyses. Thus, Hypothesis 8 was confirmed.

Predicting change in importance ratings following experience with alcohol. Hypothesis 9 postulated that the actual experience of positive and negative drinking-related consequences would predict changes in ratings of the importance of experiencing or avoiding these consequences in the future. To examine this hypothesis, a series of multiple regressions was performed. The criterion variables were Time 2 importance ratings for the seven categories of consequences of drinking. The predictors in each equation were entered in two steps. On each first step, the appropriate Time 1 importance rating was entered. On each second step, the set of positive experienced consequences and the set of negative experienced consequences were added as a simultaneous set-wise regression. This analysis calculated an R^2 for each set, indicating the unique contribution of the group of predictors to the prediction of change in importance ratings. This two-step procedure was followed for each of the seven categories of consequences.

The results of these 7 multiple regression analyses are summarized in Table 28. The individual consequences that made significant unique contributions to the prediction of change in importance ratings are presented in the table, as well as the step and total R^2s. The first step was significant in each of the seven analyses, R^2 = .19 to .51, all $p < .001$, indicating that the importance ratings demonstrated a certain level of stability over the three-week interval. The second steps added the Time 2 positive and negative experienced consequences. The experience of positive consequences predicted a significant amount of change in five of the seven importance ratings, R^2 = .04 to .24, $p < .05$. That is, individuals

who experienced higher levels of each of positive consequences believed it was more important to experience them again in the future. The experience of negative consequences did not predict a significant amount of change in any of the importance ratings.

Insert Table 28 about here

Predicting change in intended alcohol use from change in importance ratings. Hypothesis 10 predicted that when ratings of the importance of experiencing or avoiding consequences of drinking changed, intentions to drink in the future should also evidence change. To examine this prediction, a series of seven multiple regressions were performed. The criterion variable in each regression was intended alcohol use measured at Time 2. Intentions to drink were used as the measure of alcohol use because they referred to the period following Time 2, and thus did not overlap in time with the predictor variables. Intentions to drink are significantly correlated with actual drinking behaviour (r = .69 between Time 1 intended alcohol use and Time 2 actual alcohol use, $p <$ .001). The predictors were entered in two steps. On the first step in each equation, intended alcohol use at Time 1 was entered. On the second step, a variable representing change in each of the seven importance ratings was entered. Change in importance ratings was measured using residual change scores (Bereiter, 1963; Lord, 1963). Residual scores for each of the seven categories of consequences were computed by regressing each Time 2 score on its respective

Time 1 score. The resulting residual change scores were then used as predictors in the second steps of the multiple regressions. Thus the first step in each of the seven multiple regressions was identical (i.e, the predictor was Time 1 intended alcohol use). The second steps differed: in each regression one of the seven residual change in importance scores was entered.

The results are presented in Table 29. The first step was significant, R^2 = .58, $p < .001$, indicating a moderate level of stability in intentions to drink. The results for the second steps were as follows. Changes in the importance of experiencing positive consequences of drinking were positively associated with changes in drinking intentions, as predicted in Hypothesis 10. That is, individuals who rated the importance of experiencing positive consequences more highly at Time 2 than at Time 1 also reported <u>increased</u> intentions to drink in the period following Time 2. Conversely, individuals for whom the importance of experiencing positive consequences decreased between Times 1 and 2 intended to drink <u>less</u> in the period following Time 2.

Insert Table 29 about here

Changes in the importance of avoiding negative consequences of drinking were negatively associated with changes in drinking intentions, also as hypothesized. In other words, individuals who rated the importance of avoiding negative consequences more highly at Time 2 than at Time 1 reported <u>decreased</u> intentions to drink at Time 2. Conversely, individuals for whom the importance

of avoiding negative consequences decreased between Times 1 and 2 intended to drink more in the 3 weeks following Time 2.

A process model linking experienced consequences, changes in importance ratings, and changes in intended alcohol use. The final two hypotheses concerned the extent to which naturally-occurring experience with alcohol and its resulting consequences would predict changes in the positive and negative importance ratings (Hypothesis 9) and, in turn, changes in intended alcohol use (Hypothesis 10). The previous two sets of analyses provided support for these hypotheses. A final analysis examined a process model linking the experience of positive and negative consequences of drinking, changes in positive and negative importance ratings, and changes in intended alcohol use. This model was evaluated using structural equation modeling with manifest variables (path analysis).

In order to simplify the analysis, the variables were first reduced in the following manner: (a) Positive Experienced Consequences scores were computed as the average of Fun, Peer Experience, Relaxation/Coping, and Image/Reputation consequences experienced in the three weeks between Times 1 and 2; (b) Negative Experienced Consequences scores were computed as the average of Physical, Behavioural, and Driving-Related consequences experienced during this same time period; (c) a Change in Positive Importance ratings variable was created by first averaging the four positive importance ratings at Time 1 and at Time 2, respectively, then computing change scores by regressing the Time 2 average on the Time 1 average and saving the residual scores; (d) similarly, a

Change in Negative Importance ratings variable was created as the residual difference between Time 1 and Time 2 average negative importance ratings; and (e) a Change in Intended Alcohol Use variable was computed as the residual difference between intended alcohol use at Time 1 and at Time 2.

The model tested in the analysis is presented in Figure 6. The exogenous variables were Positive Experienced Consequences and Negative Experienced Consequences. These variables were hypothesized to predict Change in Positive Importance and Change in Negative Importance (Hypothesis 9). Change in Positive Importance and Change in Negative Importance, in turn, were hypothesized to predict Change in Intended Alcohol Use (Hypothesis 10). No direct relationship was expected between the two exogenous variables (Positive and Negative Experienced Consequences) and the final endogenous variable (Change in Intended Alcohol Use) because the link between these sets of variables was hypothesized to be indirect, through changes in the importance ratings.

Insert Figure 6 about here

The extent to which the hypothesized model described the observed interrelations among these five variables was assessed using LISREL (Jöreskog & Sörbom, 1988). The results are presented in Figure 6. The global indices of fit indicated that the hypothesized model described the data well, $\chi^2 = 8.43$, $p = .04$; goodness-of-fit index (GFI) = .98; adjusted GFI = .90. Examination of the

standardized path coefficients (local indices of fit) relevant to Hypothesis 9 showed that Positive Experienced Consequences predicted Change in Positive Importance ratings, $t = 3.14$, $p < .001$, as well as Change in Negative Importance ratings, $t = -2.22$, $p < .01$. In other words, at Time 2 participants who experienced more positive consequences of drinking between Times 1 and 2 believed it was more important to experience positive consequences, and less important to avoid negative consequences than they did at Time 1. Negative Experienced Consequences, contrary to hypothesis, was not a significant predictor of Change in Positive Importance or Change in Negative Importance. Stated differently, the extent to which participants experienced negative consequences of drinking was not related to changes in beliefs about the importance of experiencing or avoiding drinking-related consequences in the future.

With respect to Hypothesis 10, Changes in Intended Alcohol Use were significantly predicted by Changes in Positive Importance ratings, $t = 4.18$, $p < .001$, and by Changes in Negative Importance ratings, $t = -2.60$, $p < .01$. In other words, when participants' beliefs about the importance of experiencing positive consequences increased, and when their beliefs about the importance of avoiding negative consequences decreased, they intended to drink more at Time 2 than they did at Time 1. These results were consistent with Hypothesis 10.

CHAPTER VIII

DISCUSSION

The present studies examined the relations linking three groups of variables: (a) beliefs about the importance of drinking-related consequences; (b) levels of alcohol use; and (c) experienced consequences of drinking. This final chapter discusses the results and their implications. Limitations of the research and directions for future research on this topic are also reviewed. Before turning to this discussion, however, a brief overview of the organization of the study will be presented.

In Study 1, a measure of the importance of experiencing or avoiding 7 categories of consequences of drinking was developed (Hypotheses 1 & 2). Study 2 had three major foci. First, descriptive analyses examined gender and category differences in the three groups of variables (Hypotheses 3 to 5). Second, explanatory analyses examined the extent to which: (a) importance ratings predicted concurrent and future levels of alcohol use (Hypotheses 6 & 8); and (b) gender differences in importance ratings could account for gender differences in levels of alcohol use (Hypothesis 7). Finally, longitudinal analyses assessed changes in beliefs about the importance of drinking-related consequences and in intended alcohol use following naturally-occurring experience with alcohol (Hypotheses 9 & 10).

Scale Construction Phase

The purpose of the Study 1, the Scale Construction Phase, was to develop

a measure of beliefs about the importance of experiencing positive consequences and avoiding negative consequences as a result of drinking alcohol. A 50-item scale that assessed the importance of experiencing/avoiding 7 categories of consequences of drinking was created. These scales were shown to be internally consistent, to have good content validity, and to predict approximately 40% of the variance in the alcohol use of a sample of university students. In addition, analyses showed that weighting these importance ratings by subjects' assessments of the probability of experiencing each of the 50 consequences did not improve the prediction of alcohol use; thus, unweighted importance ratings were used in Study 2.

Why was it important to develop a new measure of beliefs about the importance of experiencing or avoiding consequences of drinking when several measures of alcohol expectancies -- people's beliefs about what effects alcohol has -- were available (e.g., Brown et al., 1980; Christiansen et al., 1982; Leigh, 1987; Southwick et al., 1981)? First, these existing scales assess beliefs about the effects of alcohol rather than asking respondents about their own reasons, motivations, or goals when drinking alcohol. Beliefs about alcohol's effects are assumed to motivate drinking behaviour, but this link is not examined directly (cf., Goldman et al., 1987; Leigh, 1989c; Southwick et al., 1981). That is, people are not asked why they drink, or what they hope will happen when they drink, rather, they say what they think happens when people drink. An alternative approach was taken in the present study, namely, asking respondents how

important it was to them personally that they experience each of the positive consequences and that they avoid each of the negative consequences as a result of drinking in the upcoming three weeks. Thus, this strategy assessed motivations or reasons for drinking more directly. Although at least one research paper has suggested that measuring importance may be a fruitful direction for research, a review of the literature found no studies examining the relationship between the importance of experiencing/avoiding multiple categories of consequences and levels of alcohol use. It should be noted, however, that to a certain extent importance ratings imply assessments of desirability, in that consequences judged to be important to experience are most likely also viewed as desirable (e.g., sharing in peer experience). Similarly, consequences respondents judged to be very important to avoid are probably perceived as undesirable (e.g., getting in a car accident).

Second, the previously published scales were created by using exploratory factor analyses used to construct subscales, a tactic that often resulted in poor face validity (Leigh & Stacy, 1991). The present study employed an alternative procedure: a large number of consequences of drinking were written in consultation with late adolescents and young adults, logically distinct categories of consequences were defined, and expert raters coded the set of consequences into the seven categories. Items that were retained had an average agreement of 93.3% across 10 coders.

Third, measurement problems associated with each of the previous scales

(see Chapter 2) have led some researchers to conclude that a major challenge for future research in this area is to develop new measures and/or refine existing measures of alcohol expectancies and reasons for drinking (Bauman et al., 1989; Leigh, 1989b). As a result, in the present study a new measure of the importance of experiencing or avoiding consequences of drinking was developed. In accordance with Leigh's (1989b) recommendation, this measure assessed both positive and negative consequences of drinking.

Leigh (1989b, 1989c) critiqued previously developed measures of expectancies about the effects of alcohol (Brown et al., 1980; Critchlow, 1987; Southwick et al., 1981) due to the lack of discriminant validity among their various subscales. She concluded that users of these measures should acknowledge that some of these subscales evidenced sizeable intercorrelations, and therefore should be cautious in interpreting the nature of their relations with alcohol use. In the present study, the positive and the negative subscales also demonstrated significant intercorrelations, respectively. That is, intercorrelations among the positive subscales ranged from .26 to .72 in Study 1 (.43 to .80 in Study 2), and intercorrelations among the negative subscales ranged from .62 to .86 in Study 1 (.53 to .82 in Study 2). Thus, the present subscales also showed a lack of discriminant validity. However, importance ratings of the positive consequences and of the negative consequences were quite distinct from each other, as indicated by correlations and component analyses at both times of measurement.

Thus, in subsequent multiple regression analyses predicting alcohol use by importance ratings, blocks containing the positive and the negative importance ratings were entered separately to the equation, and the $\underline{R}^2$s associated with each block were presented. The bivariate correlations and the standardized betas showing the overall and unique relationships of the importance ratings with the measures of alcohol use were also presented, but the betas were not given much interpretive prominence due to the large intercorrelations among the positive and negative importance ratings, respectively.

Hypothesis 2 was not supported. That is, weighting the importance ratings by assessments of the probability of experiencing each of the consequences did <u>not</u> lead to an improved prediction of alcohol use over the unweighted importance ratings. Some previous research has measured respondents' beliefs about the desirability of experiencing various consequences of drinking, then weighted these desirability scores by beliefs about the probability of likelihood of each consequence occurring (e.g., Bauman & Bryan, 1983, 1985; Critchlow, 1987). This strategy aims to give more emphasis or weight to consequences deemed likely than those deemed unlikely. Although the present study measured importance rather than desirability, ratings of the probability of each of the consequences were obtained in Study 1 to determine whether it was necessary to weight these importance ratings by the consequences' perceived likelihood.

Why did the unweighted importance ratings predict alcohol use better

than the weighted importance ratings? The answer probably lies in the nature of the importance variable. Probability assessments may be seen as a measure of the relative salience of the various consequences for individual respondents. Unlike desirability ratings, importance ratings may already reflect the salience of the consequences for individual respondents. In other words, participants who rate "having a good time with my friends" as very important have, by definition, already indicated that this particular consequence is very salient to them. In making assessments of importance, moreover, respondents may be less inclined to rate a consequence as very important to experience if they believe it is highly unlikely. Conversely, respondents may be more likely to rate a consequence as very important to avoid when they believe the consequence is quite unlikely, therefore avoidable.

Drinking and Social Behaviour Survey

Descriptive Analyses

Study 2 was a survey of 344 late adolescent university students living in on-campus housing. The quantity and frequency of alcohol use reported in the present sample were consistent with those found in previous research. For example, 70% of the present participants drank alcohol at least once per month in the previous year, compared to 52% of 15- to 19-year-olds and 78% of 20- to 24-year-olds in Canada's Health Promotion Survey (Siggner, 1988). Forty-five percent of the Drinking and Social Behaviour Survey respondents drank five or more drinks on at least one occasion in the previous three weeks, compared to

Johnston et al.'s (1981) finding that 42% of American Grade 12 students had done so in the previous 2 weeks. Thus, the levels of drinking in the present sample appeared to be relatively representative of late adolescents.

The first set of analyses were descriptive, examining mean-level differences in importance ratings, alcohol use, and experienced consequences (Hypotheses 3 to 5). The confirmation of Hypothesis 3, namely that males would report higher levels of alcohol use than females, was consistent with previous research using samples of the general adult population, of adolescents and young adults, and specifically of post-secondary students (Health & Welfare Canada, 1988, 1989; Jessor et al., 1991; Jessor & Jessor, 1977; Johnston et al., 1981; Siggner, 1988). Although gender differences may have narrowed somewhat and are typically less pronounced in samples of university samples, males continue to drink more than females (Crowley, 1991; Perkins, 1992). Subsequent analyses in the present data showed that males drank both more frequently and in greater quantities than did females. Although males' larger average size and different metabolism aid in their assimilation of greater quantities of alcohol, the fact that males reported experiencing more positive and negative consequences of drinking refutes the possible argument that males do not consume a meaningfully different quantity of alcohol.

Although females drank less, on average, than did males, females' frequency and quantity of alcohol use nonetheless was high. For example, 43.2% of females planned to get drunk at least once in the three weeks following Time

1 (compared to 48.8% of males). Clearly, a sizeable number of female students were consuming a large amount of alcohol, which may put them at risk, along with males who drink heavily, for more serious long-term negative consequences (Friedman, 1989).

Hypothesis 4 predicted that males would have more pro-drinking goals than females. The analyses reported in Chapter 6 showed that participants believed it was more important to avoid negative consequences than it was to experience positive consequences. Consistent with Hypothesis 4, this difference was less for males than for females. That is, relative to males, females believed that it was more important to avoid negative consequences and less important to experience positive consequences. These results are logically consistent with the finding that males drink more than females, and thus provide support for the idea that individuals' drinking behaviour is, at least in part, based on rational decision-making processes (Silbereisen & Eyferth, 1986). Since males and females, on average, evaluated the relative importance of positive and negative consequences differently, one would expect different levels of alcohol consumption.

The confirmation of Hypothesis 5a, namely that participants would actually experience more positive than negative consequences of drinking, is also consistent with an action perspective applied to alcohol use (cf., Brandtstädter, 1984, 1990; Chapman & Skinner, 1985; Silbereisen & Eyferth, 1986). It was assumed that humans direct their behaviour in ways that would maximize their

experiences of consequences they viewed as desirable and minimize their experience of consequences viewed as undesirable. The finding that more positive consequences than negative consequences were experienced shows that, on average, the participants were successful in managing their drinking behaviour in such a manner. Given this result, it was not surprising that levels of alcohol use increased between Times 1 and 2.

The finding that males reported experiencing more frequent positive and negative consequences of drinking (Hypothesis 5b) is consistent with past research. Perkins (1992) showed that male university students were much more likely to experience negative consequences as a result of drinking. Gender differences were much more pronounced for negative consequences such as getting in a fight, having trouble with the police, and damaging property, but they also existed for non-violent consequences such as feeling hungover, memory loss, and doing something regrettable (Perkins, 1992; Wechsler & Isaac, 1991 [cited in Perkins, 1992]).

Hypothesis 7 examined whether gender differences in levels of alcohol use were mediated by gender differences in importance ratings. The results supported a conclusion of mediation, although a direct relationship between gender and alcohol use remained in addition to the indirect effect of gender through importance ratings. It is not surprising that importance ratings did not fully explain the gender difference in alcohol consumption, as many other factors remained unaddressed by the model tested. For example, differences in the

average size of males and females might explain an additional portion of this relationship. What the model contributes is one explanation for the consistent finding that males drink more than females: They do so because they have different beliefs about the consequences of drinking. Future research might examine whether other group differences (e.g., age differences) may be explained by differences in these beliefs or motivations.

Prediction of Alcohol Use

A central hypothesis was that ratings of the importance of experiencing positive and avoiding negative consequences of drinking would predict levels of alcohol use concurrently (Hypothesis 6). This hypothesis was confirmed: Participants who stated that it was more important to experience positive drinking-related consequences reported drinking more frequently and in greater quantities. Participants who felt it was more important to avoid negative drinking-related consequences reported drinking less frequently and in smaller quantities. Between 39% and 45% of the variance in concurrent levels of alcohol use was accounted for by the seven importance ratings together. With respect to individual subscales, each of the seven Time 1 importance ratings had a significant bivariate relationship with concurrent measures of alcohol use, and six of the seven Time 1 importance ratings demonstrated a significant relationship with Time 2 measures of alcohol use (the exception was driving-related consequences). Each of these relationships was in the predicted direction (positive for positive consequences, negative for negative

consequences).

These findings are consistent with previous research documenting relationships between alcohol expectancies and alcohol use. Specifically, past research has shown moderate concurrent relationships between drinking behaviour and the extent to which people believe that alcohol leads to desirable effects (e.g., Bauman & Bryan, 1983; Bauman et al., 1985; Brown, 1985; Brown et al., 1980; Critchlow, 1987; Farber et al., 1980; Southwick et al., 1981). The proportion of variance in alcohol use explained by importance ratings in the present study was larger than that found in previous research on alcohol expectancies (e.g., Bauman et al., 1985; Leigh, 1989b; McCarty & Kaye, 1984). Possible reasons for this include the higher reliability of the measures in the present study (cf., Collins et al., 1990; Critchlow, 1987; Goldman et al., 1991) and the use of importance rather than desirability ratings, as discussed previously.

The importance of experiencing positive consequences was a more salient predictor of alcohol use than was the importance of avoiding negative consequences. That is, the positive importance ratings explained relatively more unique variance in levels of alcohol use than did the negative importance ratings. This finding may appear to contradict the analyses of the mean-level data, in which it was shown that participants believed it was much more important to avoid negative consequences than it was to experience positive consequences. Why would the negative consequences be less salient predictors of alcohol use, if

they are so important to avoid? There are at least three possible clues to understanding this apparent paradox.

First, positive consequences may be more salient because they are experienced sooner than negative consequences. Drinking-related consequences such as having fun, sharing in peer experience, and becoming more relaxed are typically experienced more immediately than negative consequences such as becoming ill, experiencing memory loss, or not being able to drive home. Their greater immediacy may make positive consequences more salient as motivators of drinking. That is, negative consequences that may only happen the next day may not seem very relevant the night before.

Second, although negative consequences are rated as more <u>important</u> to avoid, they may also be seen as relatively <u>easy</u> to avoid. Indeed, respondents in Study 1 rated the negative consequences as less likely to occur, and respondents in Study 2 reported experiencing fewer negative than positive consequences. Thus, the observed pattern of behaviour observed could be described as rational, in that individuals managed their alcohol use in such a way that consequences rated as important to avoid were experienced relatively infrequently.

Third, it could be argued that the importance of avoiding negative consequences was a less salient predictor of alcohol use because negative Physical, Behavioural, and Driving-Related consequences are only experienced after consuming large amounts of alcohol. According to this logic, negative importance ratings should be a stronger predictor of <u>heavy</u> drinking. However, a

very similar pattern of relationships was observed when the criterion variable was heavy drinking (average frequency of drinking 5 or more drinks and of getting drunk). That is, the importance of avoiding negative consequences explained a similarly small portion of the variance in heavy drinking. This result suggests that positive consequences are relatively more salient motivators of alcohol use, whether the amount consumed be small or large.

Longitudinal Change Analyses

Follow-up data collected three weeks after the primary data collection permitted analyses about change in beliefs and intended alcohol use following experience with alcohol. Hypotheses 9 and 10 concerned changes in the respondents' importance of experiencing and avoiding drinking-related consequences and in their intended alcohol use following naturally-occurring experience with alcohol. First-year university students were surveyed on two occasions near the start of the academic year in order to target a period of potential change in drinking-related beliefs and behaviour.

The demonstration of a relationship between importance ratings and changes in alcohol use represents a unique contribution of the present study. The longitudinal analyses examining links between actually-experienced consequences of drinking and changes in beliefs about importance and in intended alcohol use are also an important contribution. Almost no research has used longitudinal data to examine links between beliefs about the effects of alcohol and future levels of alcohol use. A notable exception is Bauman et al.'s

(1985) study demonstrating that young adolescents' beliefs about the subjective expected utility of alcohol-related consequences predicted the likelihood of them taking a first drink or increasing levels of consumption in the following year.

Hypotheses 8, 9, and 10 represented a more conservative test of the links between importance ratings, alcohol use, and experienced consequences. By predicting change in importance ratings and intended alcohol use following experience with alcohol and its resulting consequences, stronger support for the hypothesized processes linking these variables was provided. First, a relationship was demonstrated linking the importance of experiencing positive consequences and avoiding negative consequences of drinking with changes in levels of alcohol use (Hypothesis 8). Second, the experience of positive consequences of drinking was shown to predict increases in the importance of experiencing positive consequences and decreases in the importance of avoiding negative consequences (Hypothesis 9). The experience of negative consequences did not make a unique contribution to the prediction of changes in importance ratings. Third, changes in positive and negative importance ratings were shown to predict changes in intentions to drink in the future (Hypothesis 10).

Theoretical Implications

How well do the present results correspond with the assertions of the developmental action perspective? According to this perspective, humans interpret and direct their own behaviour (Chapman & Skinner, 1985). Based in part on personal beliefs and expectations about possible outcomes of behaviour,

actions are performed to achieve personal goals. The resulting outcomes are then evaluated as to their relative success or failure, and adjustments are made to individual beliefs and future plans for behaviour. Chapman and Skinner (1985) suggested that these short-term regulations of behaviour could be called microdevelopmental in nature. Over longer time periods, cumulative regulations or action sequences may result in more systematic change. Thus, the individual is viewed as an active co-producer of his or her own behaviour and development (Brandtstädter, 1984; Lerner & Busch-Rossnagel, 1981). According to Brandtstädter (1990),

> Individuals shape their own ontogenetic history by selecting and creating developmental niches and exposing themselves to a specific range of alimentation, stimulation, and information. (p. 160).

The present results are consistent with such a description of human behaviour and development. The participants were late adolescents beginning their university education and life in university residence. This normative developmental transition to a new role and "developmental niche" (cf. Brandtstädter, 1990) involves many challenges and adjustments. One characteristic of this new environment is the expectation and reality of a relatively high level of alcohol use. The demonstration of a strong relationship between participants' individual beliefs about the importance of experiencing and/or avoiding consequences of drinking with concurrent and future levels of alcohol use supports the notion of behaviour being goal-directed. Moreover, the

changes in importance ratings that occurred following experience with alcohol as well as the concomitant changes in intended alcohol use can be interpreted as microdevelopmental in nature (cf. Chapman & Skinner, 1985). That is, outcomes (experienced consequences of drinking) were evaluated as to their relative success and/or failure, and beliefs and future goals were adjusted. Thus, the adolescent participants actively directed their own drinking behaviour.

Practical Implications

The relatively greater salience of positive consequences relative to negative consequences has interesting implications for the planning of prevention programs. Positive importance ratings were more strongly related to alcohol use, and participants experienced more positive consequences as a result of drinking. In other words, drinking behaviour seemed to be more motivated by a desire to experience positive drinking consequences than by a desire to avoid negative ones. These results are quite congruent with images portrayed by beer advertisers implying that drinking is a good way to have fun and share in peer experience. Conversely, images portrayed by many prevention efforts pointing emphasizing the manifold destructive effects of alcohol may contradict the immediate personal experience of these adolescents.

These results suggest that messages or programs that overemphasize negative consequences of alcohol, particularly if they also fail to acknowledge positive consequences of drinking, risk losing their credibility and therefore their potential impact. Perhaps a more realistic approach would be to also address

positive functions served by alcohol use (e.g., having fun with friends, relaxing), and to encourage the use of alternative means of satisfying these goals. Another relatively simple strategy that may minimize a very potent risk of alcohol use -- injury or death due to driving after drinking -- is to not restrict drinking in university residences. Although it might be argued that such permissiveness will encourage alcohol abuse, it creates the opportunity to drink close to home, and therefore eliminates the need for transportation afterwards.

Limitations

Interpretations of the results should be made in light of several limitations of the sample, design, and measures. The targeted sample was first-year students living in residence at one university campus. While the response rate was good (78.5%), the results might not generalize well to other populations. Younger adolescents and adults might have different motivations for drinking. Similarly, late adolescents not attending educational institutions or students living with parents might rate the importance of experiencing consequences differently or might drink more or less frequently. Another limitation of the sample was that more females (n = 222) than males (n = 122) participated. Although it was not possible to verify the possibility, this differential participation rate may have been due to a greater commitment to the project among female resident advisers (who recruited the subjects) rather than to a lack of interest on the part of the male research participants themselves.

A limitation of the longitudinal results was the high attrition between

Times 1 and 2 (51%). However, analyses comparing cases available at Time 2 with cases missing at Time 2 revealed no significant mean-level differences between these two groups' demographic and situational variables, alcohol use, importance ratings, or experienced consequences at Time 1. Thus, attrition did not appear to be related to the major variables in the present study.

A strength of the design was its measurement of short-term change in importance ratings and alcohol use. The results, however, would be strengthened if data were collected on more than two occasions and over longer periods of time. Such longer-term longitudinal studies would permit the examination of developmental change in reasons for drinking and for limiting drinking across adolescence and adulthood.

Finally, the data collected were all based on self-reports. Although it is difficult to imagine another method that could replace self-reports of individual beliefs and of alcohol use, the study perhaps would be strengthened by also collecting corroborating information from roommates or RAs, or by using a retrospective diary method to assess personal alcohol use (O'Hare, 1991).

Directions for Future Research

The measurement properties of the subscales would be strengthened by improving their discriminant validity. However, if beliefs about logically distinct positive and negative consequences of alcohol use are truly related, the elimination of all items showing relations with other subscales would create independence at the expense of veridicality. The extent to which multiple

consequences of drinking may be meaningfully distinguished is a logical as well as an empirical debate. It remains possible that although importance ratings of positive consequences and of negative consequences are intercorrelated, respectively, these reasons for drinking and for limiting drinking may have differential developmental trajectories. For example, the importance of having fun as a result of drinking may be particularly important during adolescence, whereas adults may use alcohol to relax and unwind. Moreover, particular categories of reasons for drinking may make unique contributions to the prediction of longer-term problem drinking. For example, individuals who consistently use alcohol as a strategy for coping with everyday stresses may be at risk for later problems with alcohol.

An interesting task for future research on beliefs about and motivations for alcohol use would be to compare the new measure of importance ratings developed in Study 1 with previously existing scales (e.g., Brown et al., 1980; Christiansen et al., 1982). The better prediction of alcohol use provided by the newly developed measure may be a result of its higher reliability, different assortment of items, and/or its focus on personal importance rather than desirability or agreement regarding the effects of alcohol in general.

Future research should examine longer-term developmental change in the processes surrounding motivations for drinking and for limiting drinking. Cross-sectional studies could explore age-related differences in beliefs about the importance of experiencing and avoiding consequences as a result of drinking, as

well as whether the salience of various consequences as predictors of alcohol use varies systematically across the life cycle (cf., Furby & Beyth-Marom, 1992). One potential hypothesis would be that the decline in levels of alcohol use typically associated with the adoption of adult work and family roles (cf., Jessor, 1987; Kandel & Yamaguchi, 1985; Schulenberg et al., 1992) is related to changes in the importance of experiencing or avoiding various consequences of drinking. For example, 30-year-olds may drink less, on average, than 20-year-olds because they find it less important to share in peer experience and more important to avoid negative consequences.

Longitudinal studies charting developmental change in importance ratings and in the links between importance ratings and alcohol use would also provide insights into motivations for drinking. Future research could use an adapted version of the current scales to examine young adolescents' motivations for and against drinking. Christiansen et al. (1982) showed that school-aged children had beliefs about the effects of alcohol that predated any personal consumption. Data concerning the factors that children consider before they decide to take their first drink would be very useful in the planning of programs to delay experimentation with alcohol among children and younger adolescents.

The first few weeks of the university year were targeted for data collection in the present study. Other short-term longitudinal studies could target similar developmental transitions or periods of life likely to provoke change in drinking-related beliefs and behaviour. For example, the transition

from high school or post-secondary education to employment would be an interesting period. Similarly, changes in intimate relationships (e.g., breaking up with boy/girlfriend, getting married) may be associated with changes in drinking patterns and in the functions served by alcohol use.

The present study assumed that risk behaviours such as alcohol use serve functions for individuals, and the demonstration of a relationship between importance ratings and drinking behaviour supported this idea. The same goals or functions may also be achieved by other less risky behaviours. For example, students may share in peer experience through sports, campus clubs, study groups, or many other informal social activities and interactions. A potentially fruitful avenue for future research would be to identify alternative strategies and activities that adolescents use to achieve the same goals served by alcohol use.

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Table 1

Conceptual Definitions: Categories of Consequences of Drinking

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Positive Consequences of Drinking:

1. Fun: Positive consequences that have to do with amusement, fun, pleasure, having a good time; and/or, where mood becomes more positive, animated, confident, up.

2. Sharing in Peer Experience: Positive consequences having to do with sharing an experience with others, participating in an activity with friends, or being part of a group; may be expressed positively (e.g., feeling part of the group) or negatively (e.g., not feeling left out of the group).

3. Relaxation/Coping: Positive consequences having to do with relaxation, reduction of anxiety, relief of frustration, or coping with environmental demands; and/or where mood becomes more calm, less anxious, more "down".

4. Image/Reputation: Positive consequences related to the creation, maintenance, or negation of one's reputation or image; and/or concern with how one looks to others.

Negative Consequences of Drinking:

5. Physical Effects: Negative consequences that are physical, that occur to the body; consequences that affect how one's body feels, and/or how the body can or does act.

Table 1, cont.

Negative Consequences of Drinking, cont.:

6. Behavioural Effects: Negative consequences that are psychological, mental, or cognitive; consequences that affect how the mind feels, and/or how a person can or does act.

7. Driving-Related: Negative consequences having to do with the use of cars: not being able to drive safely, not having someone else to drive one around safely, concern about causing harm to self or others due to driving while intoxicated (DWI), or concern about getting caught for DWI.

Table 2

Summary of Hypotheses

Study 1: Scale Construction Phase

1. Importance ratings of the seven categories of consequences will form seven internally consistent scales.
2. (a) Importance ratings will predict levels of alcohol use. Importance ratings of positive consequences will be positively related to alcohol use; importance rating of negative consequences will be negatively related to alcohol use.
   (b) Weighting importance ratings by probability ratings will improve the prediction of alcohol use.

Study 2: Drinking and Social Behaviour Survey

Concurrent Analyses

3. Males, relative to females, will report higher levels of alcohol use.
4. Males will rate the importance of experiencing positive consequences of drinking higher than will females; females will rate the importance of avoiding negative consequences higher than will males.
5. (a) Male and female participants will report actually experiencing a larger number of positive than negative consequences of drinking.
   (b) Males will report actually experiencing a larger number of positive and negative consequences of drinking than will females.

Table 2, cont.

6. Importance ratings will predict levels of alcohol use, concurrently (same as Hypothesis 2).
7. Gender differences in alcohol use will be accounted for by gender differences in importance ratings.

Longitudinal Analyses

8. Importance ratings at Time 1 will predict changes in levels of alcohol use.
9. Experienced consequences will predict changes in importance ratings.
10. Changes in importance ratings will predict changes in intentions to drink alcohol.

Table 3

Study 1: Internal Consistency, Means, and Standard Deviations: Alcohol Use and Opportunity to Drink

Variable	# items	alpha	Mean	SD
Drinking, past 12 months[a]	4	.89	2.95	1.16
Intended drinking, next 3 weeks[b]	4	.86	1.91	.74
Opportunity to drink[c]	5	.81	3.97	.83

Note. n = 95-96. Higher scores indicate more frequency or quantity of alcohol use, or more opportunity to drink. [a]Possible range = 1 to 8. [b]Possible range = 1 to 6. [c]Possible range = 1 to 5.

Table 4

Study 1: Descriptive Characteristics of 78-Item Measure of Importance of Consequences of Drinking

Categories	# items	Mean	SD	alpha[a]
Positive consequences:				
Fun	6	2.23	.89	.87
Peer Experience	10	1.88	.72	.90
Relaxation/Coping	11	1.95	.75	.92
Image/Reputation	10	1.20	.35	.87
Negative Consequences:				
Physical	17	3.27	1.03	.95
Behavioural	15	3.50	1.13	.96
Driving	9	4.12	1.06	.95

Note. n = 93 to 95. Subjects rated importance of experiencing positive consequences and avoiding negative consequences. Higher scores indicate more important to experience/avoid consequences. Possible range for all scores: 1 (Not at all important to me) to 5 (Very important to me).

[a]Internal consistency of unweighted importance ratings.

Table 5

Study 1: Descriptive Characteristics of 50-Item Measure of Importance of Consequences of Drinking

Categories	# items	Mean	SD	alpha[a]	alpha-w[b]
Positive consequences:					
Fun	6	2.23	.89	.87	.67
Peer Experience	6	2.12	.88	.88	.70
Relaxation/Coping	6	2.06	.87	.90	.86
Image/Reputation	8	1.22	.38	.83	.60
Negative Consequences:					
Physical	10	3.34	1.05	.92	.80
Behavioural	8	3.53	1.10	.92	.87
Driving	6	4.04	1.11	.92	.81

Note. n = 93 to 95. Subjects rated importance of experiencing positive consequences and avoiding negative consequences. Higher scores indicate more important to experience/avoid consequences. Possible range for all scores: 1 (Not at all important to me) to 5 (Very important to me).
[a]Internal consistency of unweighted importance ratings. [b]Internal consistency of importance ratings weighted by probability ratings.

Table 6

Study 1: Intercorrelations and Rotated Component Loadings of Importance Ratings, 50-Item Version

Categories	Correlations 1.	2.	3.	4.	5.	6.	Rotated Compon. Loadings C1	C2
Positive Consequences:								
1. Fun							-.23	.83
2. Peer Experience	.72**						-.11	.88
3. Relaxation/Coping	.51**	.48**					.12	.74
4. Image/Reputation	.34**	.52**	.26**				-.05	.64
Negative Consequences:								
5. Physical	-.32**	-.22*	-.04	-.13			.90	-.16
6. Behavioural	-.25**	-.11	.03	-.08	.86**		.94	-.05
7. Driving	-.15	-.10	-.08	-.06	.62**	.69**	.83	.02

Note. n = 93 to 95.

*p < .05. **p < .01. ***p < .001.

Table 7

Study 1: Correlations and Multiple Regressions Predicting Alcohol Use by Unweighted Importance Ratings

	Alcohol Use					
	Past 12 Months			Next 3 Weeks		
Categories	r	β^a	R^2	r	β	R^2
Positive Consequences:						
Fun	.53***	.26		.54***	.27*	
Peer Experience	.46***	.23		.50***	.33*	
Relaxation/Coping	.47***	.27*		.40***	.12	
Image/Reputation	.08	-.22*	.31***	.12	-.19	.30***
Negative Consequences:						
Physical	-.23*	-.21		-.16	-.18	
Behavioural	-.14	.02		-.08	-.02	
Driving	-.01	.11	.02	.09	.23*	.04
Total R^2			.40***			.39***

Note. n = 93 to 95. Multivariate R^2 = .47, p < .001. $^a\beta$ = standardized beta.
*p < .05. ***p < .001.

Table 8

Study 1: Correlations and Multiple Regressions Predicting Alcohol Use by Weighted Importance Ratings[a]

	Alcohol Use					
	Past 12 Months			Next 3 Weeks		
Categories	r	β^b	R^2	r	β^b	R^2
Positive Consequences:						
Fun	-.07	-.08		.01	.01	
Peer Experience	.02	.06		.07	.03	
Relaxation/Coping	.03	.09		-.01	.04	
Image/Reputation	.07	-.06	.01	.17	.14	.03
Negative Consequences:						
Physical	-.10	.04		.11	.07	
Behavioural	-.14	-.17		-.17	-.21	
Driving	-.11	.00	.02	-.14	-.02	.03
Total R^*			.04			.06

Note. n = 93 to 95. Multivariate R^2 = .10, NS. [a]Importance ratings weighted by probability ratings (computed as the product of their deviation scores). [b] β = standardized beta.

$^*p < .05$. $^{***}p < .001$.

Table 9

Study 2: Internal Consistency Reliabilities (Cronbach's coefficient alpha): Measures of Alcohol Use

	Number of Items	Time 1 α[a]	Time 2 α
Alcohol Use			
Past 12 months[b]	4	.91	
Past 3 weeks	4	.93	.93
Future 3 weeks	4	.92	.94

Note. At Time 1, n = 336-344. At Time 2, n = 228-232.

[a] α = Cronbach's coefficient alpha. [b]measured at Time 1 only.

Table 10

Study 2: Internal Consistency Reliabilities (Cronbach's coefficient alpha): Importance Ratings and Experienced Consequences of Drinking

	Number of Items	Time 1 α[a]	Time 2 α
Importance Ratings			
Fun	6	.90	.91
Peer Experience	6	.92	.93
Relaxation/Coping	7	.89	.91
Image/Reputation	7	.88	.88
Physical	10	.89	.90
Behavioural	8	.86	.90
Driving-related	6	.85	.87
Experienced Consequences[a]			
Fun	6	.95	.95
Peer Experience	6	.90	.90
Relaxation/Coping	7	.90	.91
Image/Reputation	7	.87	.89
Physical	10	.89	.39
Behavioural	8	.85	.85
Driving-related	6	.61	.53

Table 10, cont.

Note. At Time 1, n = 315-344. At Time 2, n = 217-232. [a] α = Cronbach's coefficient alpha. [b]How often subjects had experienced consequences of drinking in the previous 3 weeks. Possible range: 0 (Never happened) to 4 (Happened 4 or more times).

Table 11

Study 2: Means and Standard Deviations (in parentheses): Measures of Alcohol Use at Time 1

	All	Females	Males
Past 12 months[a]	2.87 (1.26)	2.72 (1.13)	3.14 (1.42)
Past 3 weeks[b]	2.13 (1.02)	1.96 (.84)	2.42 (1.23)
Next 3 weeks[b]	2.03 (.90)	1.89 (.76)	2.28 (1.07)

Note. Total n = 330-344. For females, n = 215-222. For males, n = 113-122. Higher scores indicate more frequency or quantity of drinking.

[a]Possible range = 1 to 8. [b]Possible range = 1 to 6.

Table 12

Study 2: Frequency of Alcohol Use in 12 Months Preceding Time 1

	Percentage of Respondents		
Frequency	Drink any alcohol	Drink 5 or more drinks	Get drunk
Not at all	6.3%	35.8	33.3
Less than once a month	24.0	28.4	38.5
Once a month	10.4	14.7	9.4
Once every 2 weeks	20.8	14.7	14.6
Once a week	19.8	3.2	3.1
2-3 days a week	16.7	3.2	1.0
4-6 days a week	2.1	-	-
Everyday	-	-	-

Note. n = 343 to 344.

Table 13

Study 2: Quantity of Alcohol Consumption Per Drinking Occasion (for Participants Who Drank) in 12 Months Preceding Time 1

Drinks per occasion	Percentage of Respondents
1 drink	15.7%
2 or 3 drinks	23.0
4 to 6 drinks	33.3
7 to 9 drinks	14.0
10 to 12 drinks	3.7
more than 12 drinks	0.3

Note. n = 300.

Table 14

Study 2: Frequency of Alcohol Use in 3 Weeks Preceding and 3 Weeks Following (in parentheses) Time 1

	Percentage of Respondents		
Frequency	Drink any alcohol	Drink 5 or more drinks	Get drunk
Not at all	23.5% (25.6)	55.5 (55.8)	52.9 (54.8)
Once or twice in 3 weeks	39.2 (40.1)	23.3 (25.9)	27.6 (28.6)
Once a week	15.1 (22.4)	11.6 (11.9)	10.2 (10.8)
2-3 days a week	18.0 (10.5)	7.6 (6.1)	6.7 (5.5)
4-6 days a week	3.8 (1.2)	1.7 (0.0)	2.3 (0.0)
Every day	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)

Note. n = 343-344.

Table 15

Study 2: Quantity of Alcohol Consumption Per Drinking Occasion (for Participants Who Drank) in Previous 3 Weeks and Upcoming 3 Weeks

	Percentage of Respondents	
Drinks per occasion	Previous 3 Weeks	Upcoming 3 Weeks
1 drink	14.4	12.5
2 or 3 drinks	36.9	41.3
4 to 6 drinks	31.6	32.2
7 to 9 drinks	13.3	11.7
10 to 12 drinks	2.7	1.1
more than 12 drinks	1.1	1.1

Note. n = 263-264.

Table 16

Study 2: Means and Standard Deviations (in parentheses): Importance of Experiencing or Avoiding Consequences of Drinking at Time 1

Categories	All	Females	Males
Positive Consequences			
Fun	2.67 (1.04)	2.59 (1.02)	2.82 (1.07)
Peer Experience	2.83 (1.08)	2.71 (1.08)	3.07 (1.04)
Relaxation/Coping	2.00 (1.08)	1.93 (.86)	2.14 (.87)
Image/Reputation	1.49 (.66)	1.42 (.57)	1.64 (.79)
Negative Consequences			
Physical	3.61 (.90)	3.81 (3.78)	3.24 (.99)
Behavioural	3.98 (.84)	4.13 (.73)	3.69 (.95)
Driving-related	4.39 (.82)	4.53 (.72)	4.13 (.92)

Note. Total n = 330-344. For females, n = 215-222. For males, n = 113-122. Subjects rated importance of experiencing positive consequences and avoiding negative consequences. Higher scores indicate more important to experience/avoid consequences. Possible range for all scores: 1 (Not at all important to me) to 5 (Very important to me).

Table 17

Study 2: Intercorrelations and Rotated Component Loadings of Importance Ratings at Time 1

Categories	Correlations						Rotated Component Loadings	
	1.	2.	3.	4.	5.	6.	C1	C2
Positive Consequences:								
1. Fun							.91	-.14
2. Peer Exp	.80***						.88	-.14
3. Relaxation	.67***	.56***					.77	-.16
4. Image/Reput.	.55***	.56***	.43***				.72	-.16
Negative Consequences:								
5. Physical	-.36***	-.34***	-.33***	-.27***			-.26	.87
6. Behavioural	-.32***	-.30***	.29***	-.29***	.82***		-.22	.88
7. Driving	-.15**	-.16**	.18***	-.19***	.53***	.53***	-.03	.79

Note. n = 323 to 330.

**p < .01. ***p < .001.

Table 18

Study 2: Means and Standard Deviations (in parentheses): Experienced Consequences of Drinking at Time 1

Categories	All	Females	Males
Positive Consequences:			
Fun	1.28 (1.19)	1.09 (1.07)	1.65 (1.32)
Peer Experience	1.31 (1.27)	1.10 (1.15)	1.71 (1.40)
Relaxation/Coping	.60 (0.81)	.51 (.74)	.77 (.91)
Image/Reputation	.42 (.67)	.32 (.53)	.60 (.87)
Negative Consequences			
Physical	.49 (.64)	.40 (.54)	.68 (.78)
Behavioural	.31 (.52)	.24 (.41)	.45 (.67)
Driving-related	.24 (.42)	.19 (.34)	.32 (.54)

Note. Total n = 333-335. For females, n = 220-221. For males, n = 113-114. Scores represent means of how often subjects experienced consequences as a result of drinking in the preceding 3 weeks. Possible range for all scores: 0 (Never happened) to 4 (Happened 4 or more times).

Table 19

Study 2: Correlations of Importance Ratings and Alcohol Use with Demographic and Situational Variables

	F-ED[a]	M-ED[b]	AGE	RES[c]	RMT[d]	OTD[e]
Importance Ratings:						
Fun	.07	.01	.07	.02	-.05	.23***
Peer Experience	.10	.01	.08	.05	-.00	.24***
Relaxation/Coping	.14*	.06	.16**	-.04	-.01	.13*
Image/Reputation	.05	-.06	.02	-.02	-.07	.06
Physical	-.11*	-.04	-.02	-.00	.01	-.22***
Behavioural	-.08	.02	-.10	-.00	-.01	-.20***
Driving	-.07	.01	-.06	-.12*	-.05	-.11
Alcohol Use:						
Previous year	.05	-.04	.12*	.01	.03	.23***
Previous 3 weeks	.06	-.03	.08	.01	.00	.30***
Following 3 weeks	.09*	-.04	.10	-.02	-.02	.25***

Note. n = 299 to 344. [a]Father's education. [b]Mother's education. [c]Academic vs. social residence. [d]Roommate or no. [e]Opportunity to drink.
*p < .05. **p < .01. ***p < .001.

Table 20

Study 2: Correlations and Multiple Regressions Showing Relationship of Importance Ratings with Alcohol Use at Time 1

	Measures of Alcohol Use								
	Past 12 Months			Past 3 Weeks			Next 3 Weeks		
Predictors	r	β[a]	R^2	r	β	R^2	r	β	R^2
Block: Positive Consequences[b]									
Fun	.59***	.20**		.54***	.17*		.55***	.02	
Peer Exp[c]	.57***	.26***		.55***	.31***		.60***	.38***	
Relax	.52***	.19***		.44***	.09		.49***	.17**	
Image	.35***	-.05	.26***	.34***	-.03	.21***	.43***	.07	.26***
Block: Negative Consequences[b]									
Physical	-.40***	-.17*		-.41***	-.16		-.42***	-.10	
Behavioural	-.35***	-.08		-.38***	-.11		-.40***	-.16*	
Driving	-.13*	.09	.03***	-.18***	.04	.04***	-.19***	.06	.04***
Total R^2			.43***			.39***			.45***

Note. n = 323. Multivariate R^2 = .53, $p < .001$. [a] β = standardized beta. [b]Blocks were entered simultaneously; R^2 and β represent unique contributions of blocks and predictors, respectively. [c]Peer Exp = Peer Experience.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 21

Study 2: Means and Standard Deviations (in parentheses): Measures of Alcohol Use at Times 1 and 2

	Time 1			Time 2		
	All	Females	Males	All	Females	Males
Past 3 weeks[a]	2.00 (.95)	1.83 (.74)	2.42 (1.26)	2.21 (1.05)	2.06 (.90)	2.57 (1.30)
Next 3 weeks[a]	1.93 (.96)	1.84 (.74)	2.17 (1.10)	2.18 (.97)	2.05 (.83)	2.50 (1.21)

Note. Total N = 169. For females, n = 121. For males, n = 48. Higher scores indicate a higher frequency or quantity of drinking. [a]possible range = 1 to 6.

Table 22

Study 2: Frequency of Alcohol Use in 3 Weeks Preceding and 3 Weeks Following (in parentheses) Time 2

	Percentage of Respondents		
	Drink any alcohol	Drink 5 or more drinks	Get drunk
Not at all	27.8% (26.0)	53.8 (50.9)	50.9 (49.4)
Once or twice in 3 weeks	39.1 (43.2)	29.0 (31.4)	31.4 (33.3)
Once a week	13.6 (18.3)	8.3 (9.5)	10.1 (9.5)
2-3 days a week	15.4 (11.8)	8.3 (8.3)	7.1 (7.7)
4-6 days a week	0.6 (0.0)	0.6 (0.0)	0.6 (0.0)
Every day	0.6 (0.0)	0.0 (0.0)	0.0 (0.0)

Note. n = 169.

Table 23

Study 2: Quantity of Alcohol Consumption Per Drinking Occasion (for Participants Who Drank) in 3 Weeks Preceding and 3 Weeks Following Time 2

	Percentage of Respondents	
Drinks per occasion	Past 3 Weeks	Next 3 Weeks
1 drink	9.0	6.3
2 or 3 drinks	32.8	37.3
4 to 6 drinks	33.6	38.9
7 to 9 drinks	18.0	15.1
10 to 12 drinks	3.3	1.6
More than 12 drinks	3.3	0.8

Note. n = 126.

Table 24

Study 2: Means and Standard Deviations (in parentheses): Importance of Experiencing or Avoiding Consequences of Drinking at Times 1 and 2

	Time 1			Time 2		
Categories	All	Females	Males	All	Females	Males
Positive Consequences						
Fun	2.63 (1.07)	2.59 (1.05)	2.74 (1.13)	2.71 (1.09)	2.68 (1.07)	2.81 (1.13)
Peer Experience	2.81 (1.09)	2.74 (1.11)	2.99 (1.05)	2.80 (1.09)	2.69 (1.09)	3.07 (1.06)
Relaxation/Coping	1.96 (.80)	1.96 (.81)	1.98 (.78)	2.02 (.84)	2.00 (.84)	2.06 (.84)
Image/Reputation	1.46 (.61)	1.40 (.56)	1.61 (.69)	1.51 (.67)	1.45 (.63)	1.66 (.75)
Negative Consequences						
Physical	3.74 (.86)	3.86 (.78)	3.43 (.99)	3.56 (.95)	3.69 (.90)	3.23 (1.00)
Behavioural	4.05 (.82)	4.13 (.77)	3.83 (.91)	3.91 (.92)	4.01 (.86)	3.67 (1.01)
Driving	4.44 (.78)	4.53 (.68)	4.19 (.96)	4.31 (.98)	4.41 (.89)	4.04 (1.14)

Note. Total N = 161-163. For females, n = 115-118. For males, n = 45-46.

Possible range: 1 (Not at all important to me) to 5 (Very important to me).

Table 25

Study 2: Intercorrelations and Rotated Component Loadings of Importance Ratings at Time 2

Categories	Correlations						Rotated Component Loadings	
	1.	2.	3.	4.	5.	6.	C1	C2
Positive Consequences:								
1. Fun							.89	-.25
2. Peer Exp[a]	.84***						.87	-.25
3. Relax[b]	.69***	.57***					.77	-.11
4. Image[c]	.51***	.56***	.36***				.71	-.06
Negative Consequences:								
5. Physical	-.42***	-.46***	-.26***	-.21**			-.25	.88
6. Behavioural	-.44***	-.42***	.22**	-.26***	.83***		-.24	.88
7. Driving	-.22**	-.18*	.23**	-.13***	.52***	.52***	-.04	.78

Note. n = 169. [a]Peer Experience. [b]Relaxation/Coping. [c]Image/Reputation.
*p < .05. **p < .01. ***p < .001.

Table 26

Study 2: Means and Standard Deviations (in parentheses): Experienced Consequences of Drinking at Times 1 and 2

	Time 1			Time 2		
Categories	All	Females	Males	All	Females	Males
Positive Consequences						
Fun	1.18 (1.18)	.99 (1.02)	1.70 (1.43)	1.19 (1.12)	1.06 (1.01)	1.53 (1.13)
Peer Experience	1.19 (1.24)	.98 (1.09)	1.75 (1.45)	1.21 (1.15)	1.08 (1.05)	1.32 (1.06)
Relaxation/Coping	.57 (.80)	.49 (.71)	.78 (.99)	.57 (.78)	.50 (.72)	1.55 (1.34)
Image/Reputation	.36 (.64)	.26 (.49)	.63 (.90)	.42 (.69)	.30 (.48)	.76 (.88)
Negative Consequences						
Physical	.42 (.60)	.33 (.49)	.64 (.79)	.44 (.61)	.34 (.48)	.73 (1.00)
Behavioural	.27 (.53)	.18 (.36)	.51 (.77)	.34 (.50)	.28 (.39)	.69 (.82)
Driving	.24 (.45)	.19 (.34)	.37 (.66)	.20 (.32)	.15 (.24)	.50 (.69)

Note. Total N = 164-166. For females, n = 119-120. For males, n = 45-46.

Possible range: 0 = Never happened to 4^+ = Happened 4 or more times.

Table 27

Study 2: Correlations and Multiple Regressions Showing Relationship of Time 1 Importance Ratings with Changes in Alcohol Use

	Measures of Alcohol Use					
	Past 3 Weeks			Next 3 Weeks		
Predictors	r	β^a	R^2	r	β	R^2
Step 1: Alcohol Use (Time 1)	.64***	.64***	.40***	.77***	.77***	.59***
Step 2: Experienced Consequences						
Block: Positive Consequences[b]						
Fun	.48***	.04		.57***	.20*	
Peer Experience	.45***	.01		.54***	.05	
Relaxation/Coping	.43***	.19*		.44***	.09	
Image/Reputation	.25***	-.05	.04*	.30***	-.09	.03**
Block: Negative Consequences[b]						
Physical	-.43***	.10		-.47***	-.07	
Behavioural	-.49***	-.34**		-.48***	-.15	
Driving	-.15	.06	.05**	-.15	.07	.03**
Total R^2			.50***			.66***

Note. n = 157. Multivariate R^2 = .48, $p < .001$. [a] β = standardized betas.

Table 27, cont.

[b]Blocks were entered simultaneously; $\underline{R}^2$ and β represent unique contributions of blocks and predictors, respectively.

$^{\cdot}\underline{p} < .05$. $^{\cdot\cdot}\underline{p} < .01$. $^{\cdot\cdot\cdot}\underline{p} < .001$.

Table 28

Study 2: Multiple Regressions Predicting Change in Importance Ratings From Experienced Consequences

	Step 1	Step 2					
	Import (T1)[a]	Pos Con. (T2)[b]		Neg Con. (T2)[b]			
Criterion Vars:	R^2	Signif. Pred.[c]	Block R^{2d}	Signif. Pred.[c]	Block R^{2d}	Step R^{2e}	Total R^2
Importance (T2)							
Fun	.52***	Fun $\beta = .41^{**}$	.03*	--	.01	.07**	.59***
Peer Exp.[f]	.47***	--	.05**	Phys $\beta = -.24^{*}$	.01	.09***	.56***
Relaxation	.40***	Relax $\beta = .63^{***}$ Fun $\beta = .29^{*}$	.24***	--	.00	.25***	.64***
Image/Reput[g]	.35***	Image $\beta = .32^{**}$	.04	--	.00	.05	.41***
Physical	.42***	--	.04*	--	.02	.11**	.53***
Behavioural	.36***	Fun $\beta = -.73^{***}$	.10***	---	.02	.17***	.53***
Driving	.19***	Relax $\beta = -.29^{**}$	.04	--	.02	.07	.26***

Table 28, cont.

Note. $\underline{n}$ = 153 to 154. [a]On Step 1, the appropriate Time 1 importance rating was entered. [b]On Step 2, the four positive consequences and the three negative consequences (measured at Time 2) were added as simultaneous sets. [c]Significant predictors; β = standardized betas. [d]$\underline{R}^2$'s refer to unique prediction of importance ratings by each set of predictors. [e]Step $\underline{R}^2$'s refer to change in $\underline{R}^2$ associated with Step 2. [f]Peer Exp = Peer Experience. [g]Image/Reput = Image/Reputation.

Table 29

Study 2: Multiple Regressions Predicting Change in Intended Alcohol Use From Changes in Importance Ratings

	Steps and Predictors		
	Step 2[a]: Change in Importance[b]		
Categories	β	R^2	Total R^2
Positive Consequences			
Fun	.21	.04***	.62***
Peer Experience	.23	.05***	.63***
Relaxation/Coping	.16	.02**	.60***
Image/Reputation	.10	.01*	.59***
Negative Consequences			
Physical	-.19	.04***	.62***
Behavioural	-.15	.02**	.61***
Driving	-.07	.00	.60***

Note. n = 157-159. Each row represents a separate multiple regression analysis. [a]In each equation, Time 1 Intended Alcohol Use was entered as Step 1; beta = .76, R^2 = .58, $p < .001$. [b]Residual change in importance of experiencing/avoiding consequences between Time 1 and Time 2.

*$p < .05$. **$p < .01$. ***$p < .001$.

Figure 1

Importance of Experiencing or Avoiding Consequences of Drinking

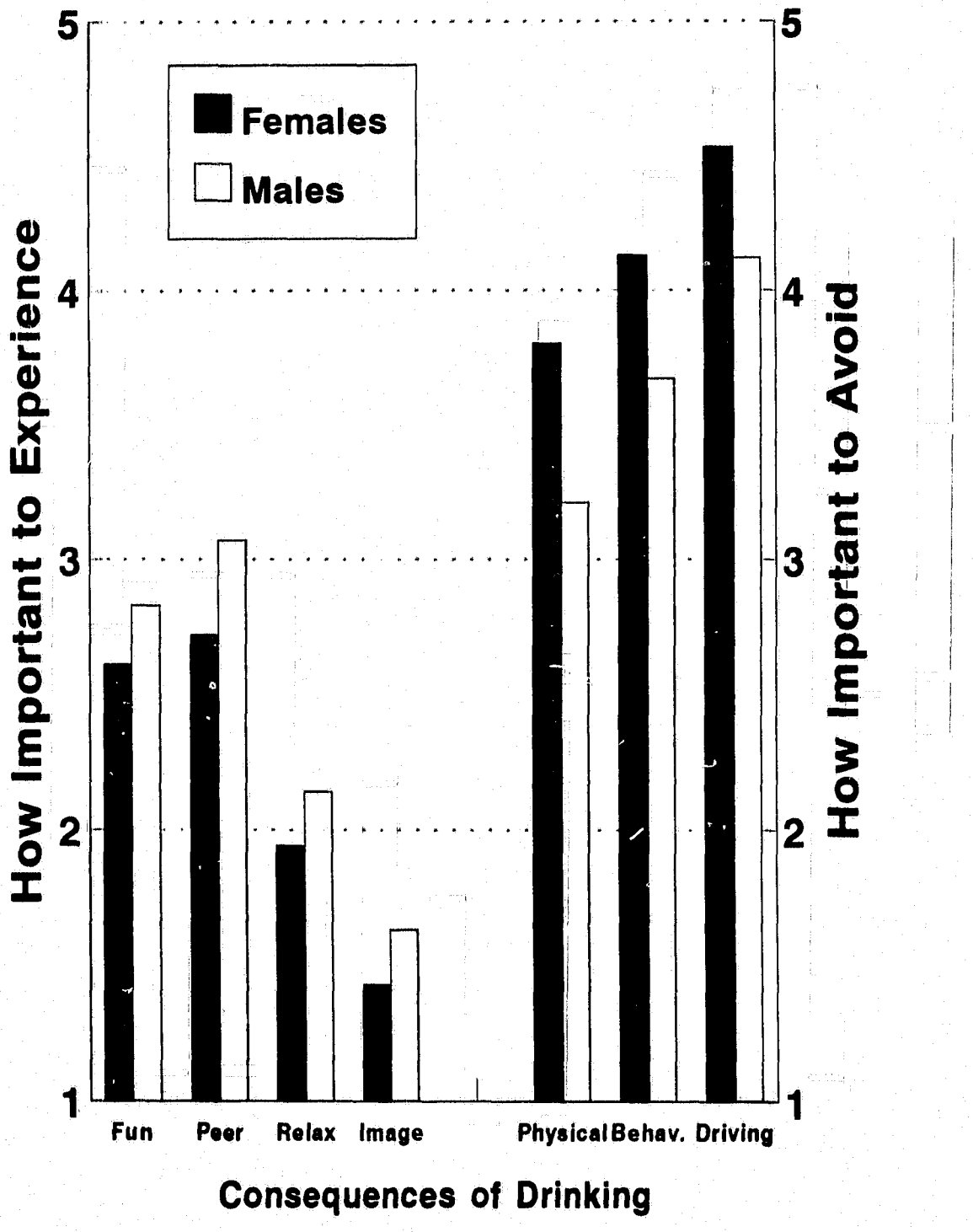


Figure 2
Experienced Consequences of Drinking

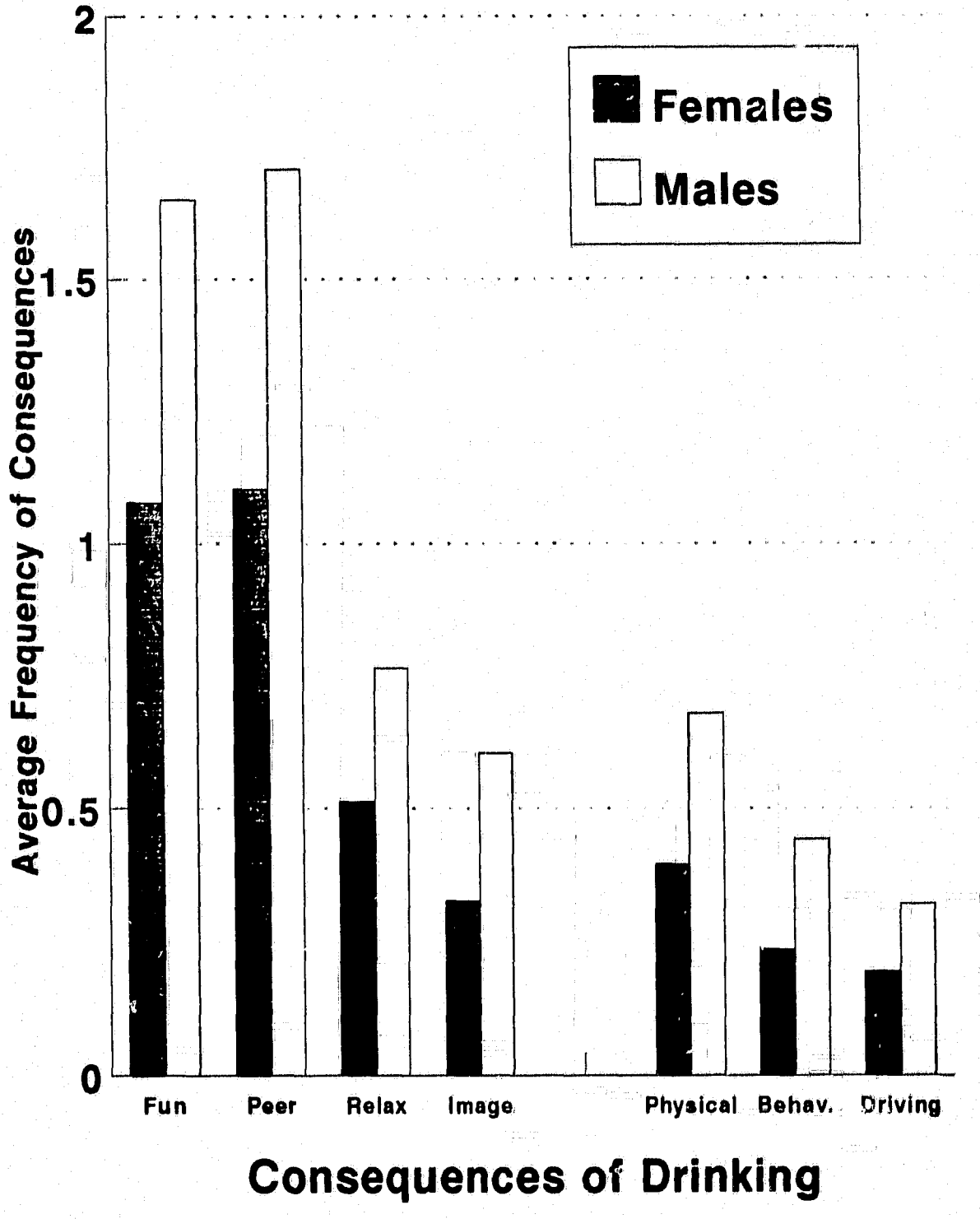


Figure 3

Importance Ratings: Gender and Type of Category Differences

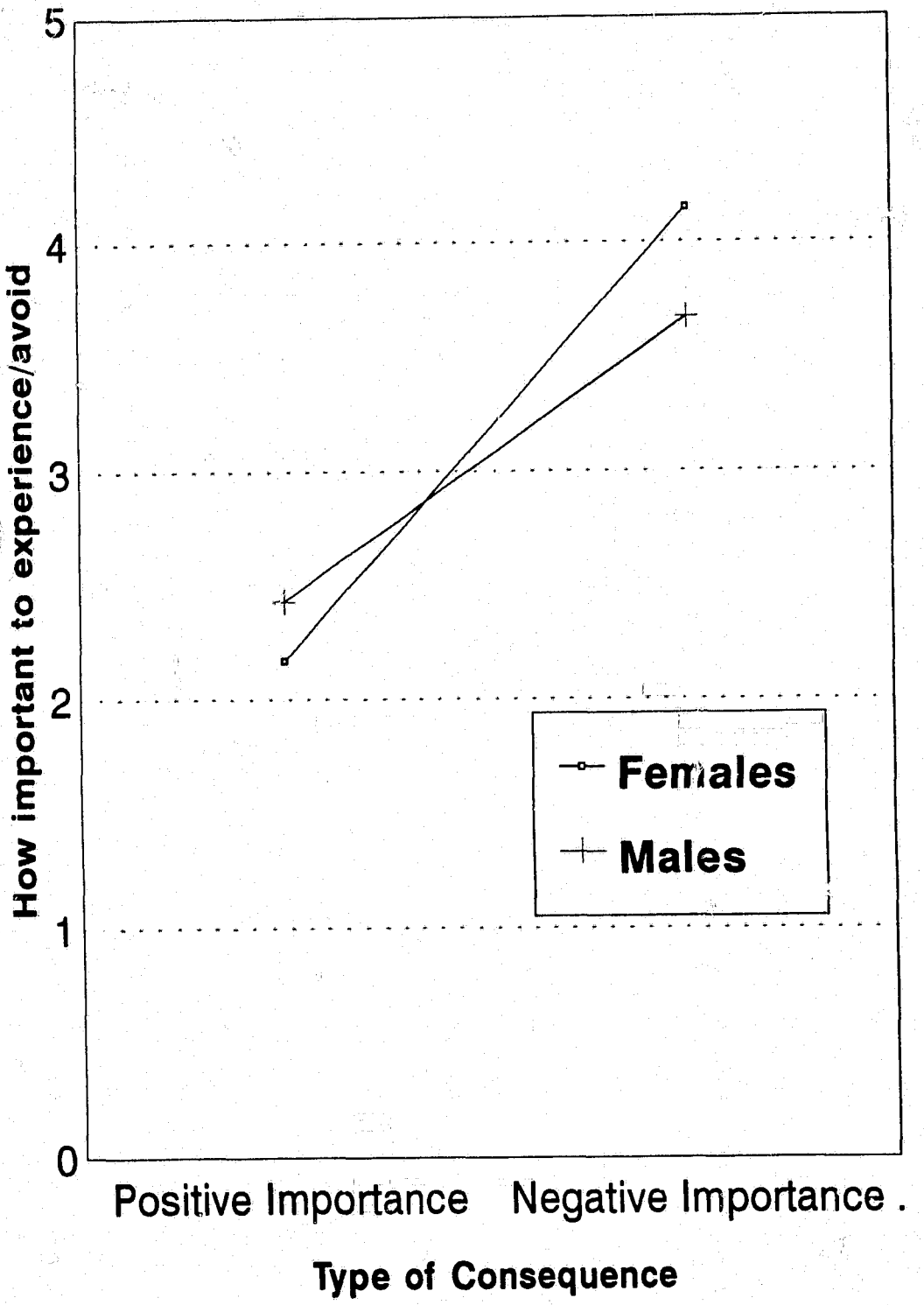


Figure 4

Experienced Consequences: Gender and Type of Category Differences

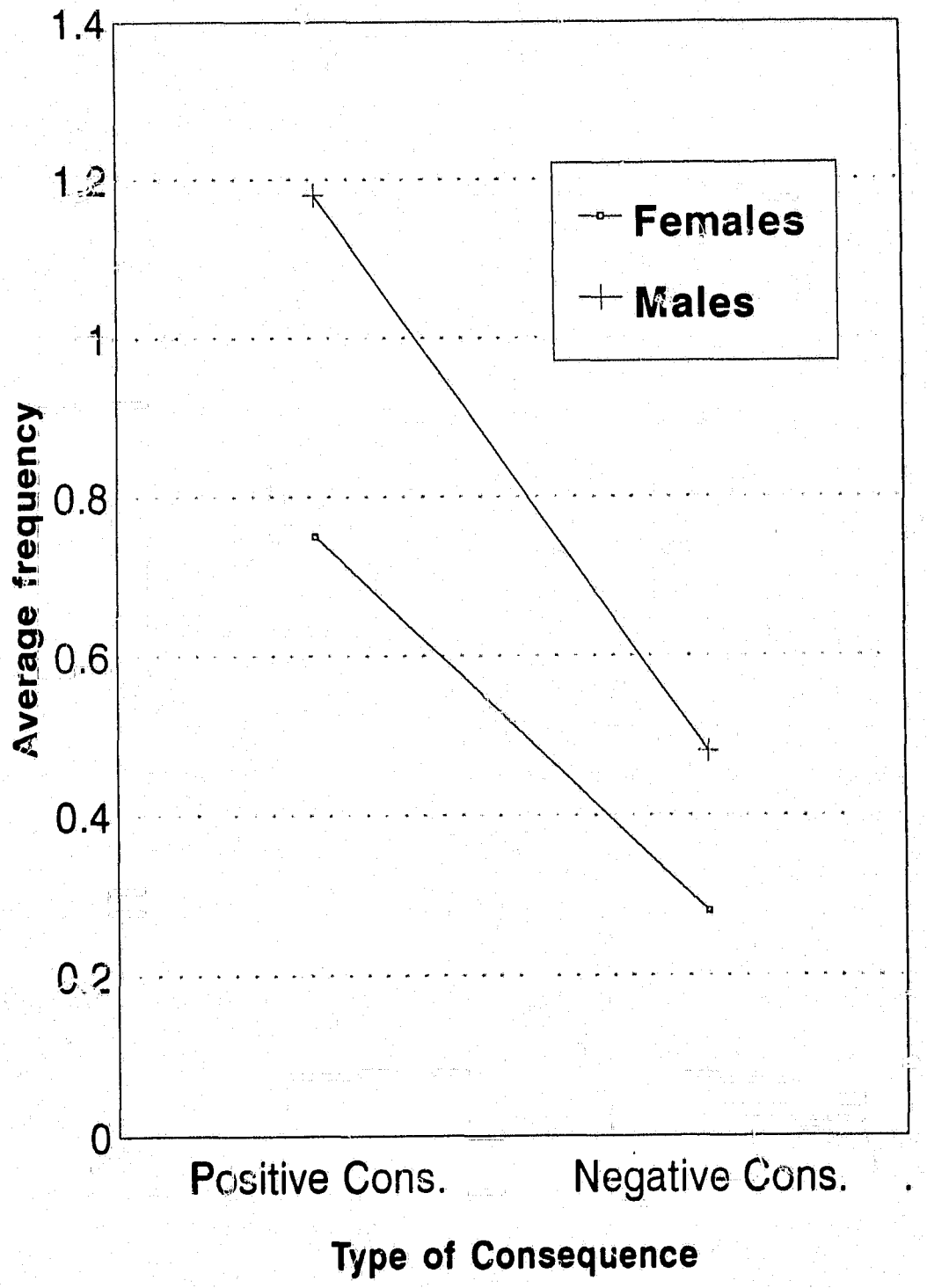
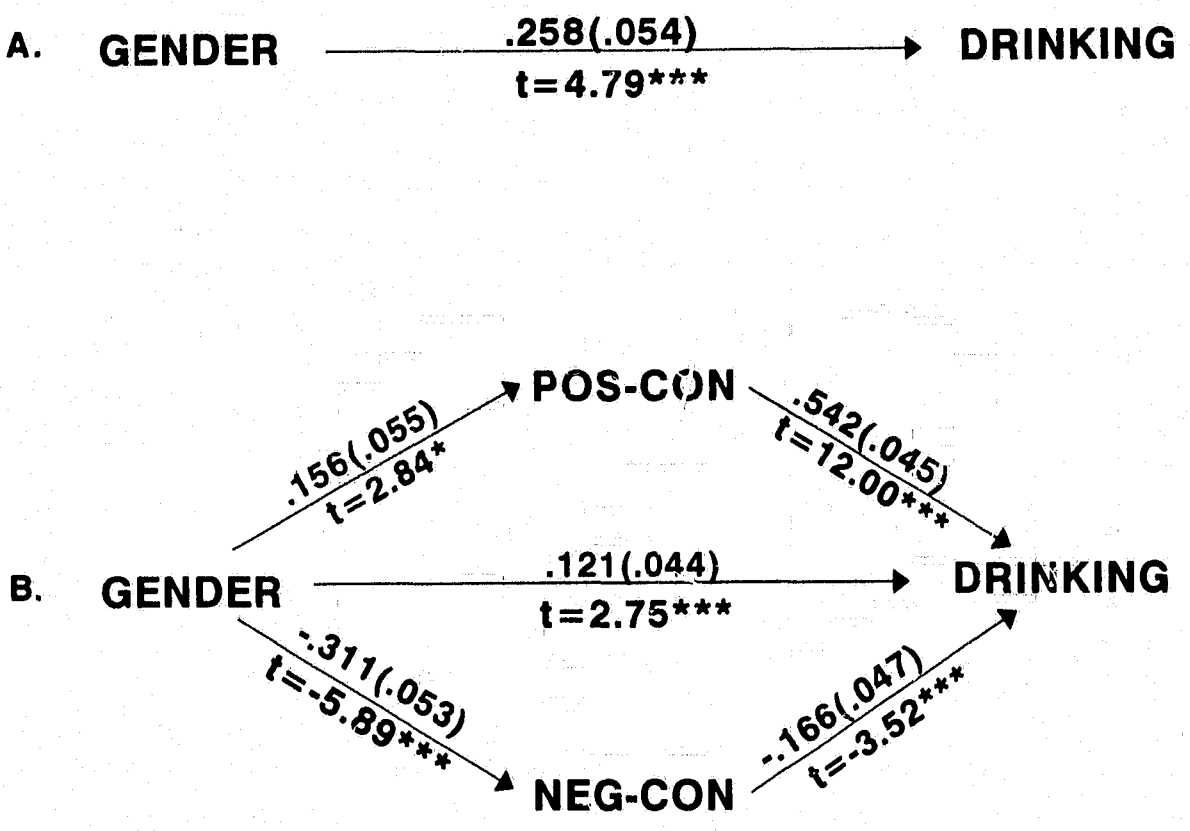


Figure 5

Path Models Illustrating Relationship of Gender, Importance of Consequences, and Alcohol Use



*p < .05. **p < .01. ***p < .001.

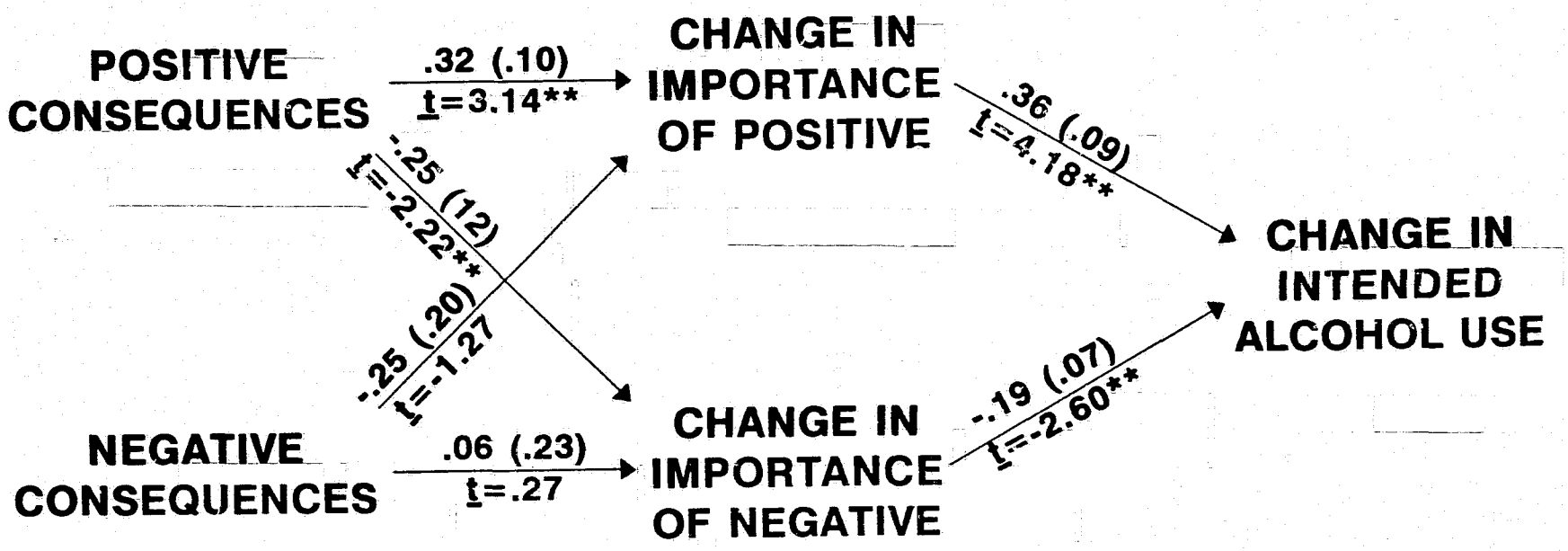
POS-CON = Mean, Importance of experiencing four positive consequences.

NEG-CON = Mean, Importance of avoiding three negative consequences.

Drinking = Mean, alcohol use in past and upcoming three weeks..

Figure 6

Structural Model Examining Change in Importance Ratings and Change in Alcohol Use Following Experience with Alcohol



X^2 (3) = 8.43, p = .04.
GFI = .98.
AGFI = .90.

Appendix A

Measures of Alcohol Use

YOUR DRINKING IN THE PAST YEAR

1. During the **PAST 12 MONTHS** how often, on average, did you drink beer, wine, or liquor *(check one only)*?

   ____ every day
   ____ 4-6 days a week
   ____ 2-3 days a week
   ____ once a week
   ____ once every two weeks
   ____ once a month
   ____ less than once a month
   ____ not at all

2. Think of all the times during the **PAST 12 MONTHS** when you drank beer, wine, or liquor. On average, how many drinks did you have on each occasion *(check one only)*?

   ____ more than 12
   ____ 10 to 12
   ____ 7 to 9
   ____ 4 to 6
   ____ 2 or 3
   ____ 1
   ____ none, I didn't drink

3. In the **PAST 12 MONTHS**, about how often did you have 5 or more drinks of beer, wine, or liquor on a single occasion *(check one only)*?

   ____ every day
   ____ 4-6 days a week
   ____ 2-3 days a week
   ____ once a week
   ____ once every two weeks
   ____ once a month
   ____ less than once a month
   ____ not at all

4. In the **PAST 12 MONTHS**, about how many times did you get drunk or high on alcohol (not just light-headed) *(check one only)*?

   ____ every day
   ____ 4-6 days a week
   ____ 2-3 days a week
   ____ once a week
   ____ once every two weeks
   ____ once a month
   ____ less than once a month
   ____ not at all

Appendix A, cont.

YOUR DRINKING IN THE PAST THREE WEEKS

1. During the **PAST 3 WEEKS**, how often did you drink beer, wine, or liquor *(check one)*?
   - ____ every day
   - ____ 4-6 days a week
   - ____ 2-3 days a week
   - ____ once a week
   - ____ once or twice in 3 weeks
   - ____ not at all

2. In the **PAST 3 WEEKS**, when you did drink, how many drinks did you have on each occasion, on average?
   - ____ more than 12
   - ____ 10 to 12
   - ____ 7 to 9
   - ____ 4 to 6
   - ____ 2 or 3
   - ____ 1
   - ____ none

3. In the **PAST 3 WEEKS**, about how often did you have 5 or more drinks of beer, wine, or liquor on a single occasion?
   - ____ every day
   - ____ 4-6 days a week
   - ____ 2-3 days a week
   - ____ once a week
   - ____ once or twice in 3 weeks
   - ____ not at all

4. In the **PAST 3 WEEKS**, about how many times did you get drunk (not just light-headed)?
   - ____ every day
   - ____ 4-6 days a week
   - ____ 2-3 days a week
   - ____ once a week
   - ____ once or twice in 3 weeks
   - ____ not at all

Appendix A, cont.

YOUR PLANS TO DRINK

These questions concern your plans or intentions to drink in the IN THE NEXT 3 WEEKS. Of course, no one knows exactly what they will do: You should just say what you think you will do.

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1. During the NEXT 3 WEEKS, how often do you plan to drink beer, wine, or liquor?
   - ____ every day
   - ____ 4-6 days a week
   - ____ 2-3 days a week
   - ____ once a week
   - ____ once or twice in 3 weeks
   - ____ not at all

2. In the NEXT 3 WEEKS, when you do drink, how many drinks will you have on each occasion, on average?
   - ____ more than 12
   - ____ 10 to 12
   - ____ 7 to 9
   - ____ 4 to 6
   - ____ 2 or 3
   - ____ 1
   - ____ none

3. In the NEXT 3 WEEKS, about how often do you plan to have 5 or more drinks of beer, wine, or liquor on a single occasion?
   - ____ every day
   - ____ 4-6 days a week
   - ____ 2-3 days a week
   - ____ once a week
   - ____ once or twice in 3 weeks
   - ____ not at all

4. In the NEXT 3 WEEKS, about how many times do you plan to get drunk (not just light-headed)?
   - ____ every day
   - ____ 4-6 days a week
   - ____ 2-3 days a week
   - ____ once a week
   - ____ once or twice in 3 weeks
   - ____ not at all

Appendix B

Measure of Opportunity to Drink

OBSTACLES TO DRINKING

Many circumstances or obstacles can prevent people from carrying out their plans. Below are listed 5 possible obstacles to drinking alcohol.
Pick the choice that best describes your experiences in the PAST 3 WEEKS.

1 = None of the time
2 = A little of the time
3 = Some of the time
4 = Most of the time
5 = All the time

In the PAST 3 WEEKS, I ...					
had enough TIME to drink when I wanted to.	1	2	3	4	5
had enough MONEY to drink when I wanted to.	1	2	3	4	5
had PEOPLE to drink with when I wanted to.	1	2	3	4	5
was able to ACQUIRE alcohol when I wanted to.	1	2	3	4	5
had a PLACE to drink when I wanted to.	1	2	3	4	5

Appendix C

Measures of Importance of Experiencing Positive Consequences of Drinking and Avoiding Negative Consequences of Drinking

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REASONS FOR DRINKING

There are many positive or desirable consequences that people might wish to experience by drinking beer, wine, or other alcoholic drinks.
The desire to experience these consequences can be seen as reasons FOR drinking.

Think about the positive consequences that you hope to experience as a result of drinking IN THE NEXT 3 WEEKS.

How IMPORTANT is it to you that you experience the following consequences as a result of drinking?

1 = Not at all important to me
2 = A little important to me
3 = Of medium importance to me
4 = Quite important to me
5 = Very important to me

	Not IMPT to me		Medium IMPT to me		Very IMPT to me
1. Having more fun	1	2	3	4	5
2. Feeling close to your friends	1	2	3	4	5
3. Showing people you drink	1	2	3	4	5
4. Feeling good	1	2	3	4	5
5. Helping you cope with daily life	1	2	3	4	5
6. Becoming more sociable	1	2	3	4	5
7. Helping you unwind	1	2	3	4	5
8. Being with your friends	1	2	3	4	5
9. Relieving boredom	1	2	3	4	5
10. Looking interesting to others	1	2	3	4	5

Appendix C, cont.

	Not IMPT to me		Medium IMPT to me		Very IMPT to me
11. Relaxing after a stressful situation	1	2	3	4	5
12. Showing people how much you can drink	1	2	3	4	5
13. Becoming more relaxed	1	2	3	4	5
14. Getting to know new people	1	2	3	4	5
15. Sharing in a group experience	1	2	3	4	5
16. Helping to maintain your wild image	1	2	3	4	5
17. Amusing yourself	1	2	3	4	5
18. Helping you get through an event	1	2	3	4	5
19. Bonding with your friends	1	2	3	4	5
20. Letting off steam	1	2	3	4	5
21. Becoming happier	1	2	3	4	5
22. Seeming more exciting to others	1	2	3	4	5
23. Looking older to others	1	2	3	4	5
24. Relieving tension	1	2	3	4	5
25. Maintaining your reputation	1	2	3	4	5
26. Having a good time	1	2	3	4	5

Note. Items composing the positive importance subscales:

Fun:	Items 1, 4, 9, 17, 21, 26
Peer Experience:	2, 6, 8, 14, 15, 19
Relaxation/Coping:	5, 7, 11, 13, 18, 20, 24
Image/Reputation:	3, 10, 12, 16, 22, 23, 25

Appendix C, cont.

REASONS FOR NOT DRINKING

There are many different negative or undesirable consequences that people might NOT wish to experience when they drink beer, wine, or other alcoholic drinks. The desire to avoid these consequences can be seen as reasons for NOT drinking or reasons for drinking less.

Think about the negative consequences of drinking that you hope you will NOT experience IN THE NEXT 3 WEEKS.

How IMPORTANT is it to you that you avoid experiencing the following as a result of drinking?

1 = Not at all important to me
2 = A little important to me
3 = Of medium importance to me
4 = Quite important to me
5 = Very important to me

	Not IMPT to me		Medium IMPT to me		Very IMPT to me
1. Ending up doing something stupid	1	2	3	4	5
2. Passing out	1	2	3	4	5
3. Feeling hungover	1	2	3	4	5
4. Getting a headache	1	2	3	4	5
5. Not remembering what you did or said	1	2	3	4	5
6. Getting a ticket for drinking & driving	1	2	3	4	5
7. Getting sick to your stomach	1	2	3	4	5
8. Getting in a car accident	1	2	3	4	5
9. Losing control of yourself	1	2	3	4	5
10. Gaining weight	1	2	3	4	5

Appendix C, cont.

	Not IMPT to me		Medium IMPT to me		Very IMPT to me
11. Saying things you don't mean	1	2	3	4	5
12. Affecting your coordination	1	2	3	4	5
13. Not getting your work done	1	2	3	4	5
14. Worrying about driving safely	1	2	3	4	5
15. Getting "the munchies"	1	2	3	4	5
16. Not concentrating as well	1	2	3	4	5
17. No one being sober enough to drive	1	2	3	4	5
18. Being in bad physical shape next day	1	2	3	4	5
19. Not being able to be the "designated driver"	1	2	3	4	5
20. Damaging your health	1	2	3	4	5
21. Getting in a fight	1	2	3	4	5
22. Doing or saying something embarrassing	1	2	3	4	5
23. Reducing your eye/hand coordination	1	2	3	4	5
24. Worrying about causing an accident	1	2	3	4	5

Note. Items composing the negative importance subscales

Physical:	Items 2, 3, 4, 7, 10, 12, 15, 18, 20, 23
Behavioural:	1, 5, 9, 11, 13, 16, 21, 22
Driving:	6, 8, 14, 17, 19, 24

Appendix D

Instructions and Response Format: Probability of Experiencing Consequences as a Result of Drinking

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Instructions:

Some consequences of drinking are more likely to occur than others. I am interested in your opinion about the probability or likelihood that YOU would experience the following positive and negative consequences if you drank a moderate amount of alcohol.

Response format:

1 = Sure it would not happen to me
2 = Think it would not happen to me
3 = Even chance: fifty-fifty
4 = Think it would happen to me
5 = Sure it would happen to me

Appendix E

Recruiting Advertisement
Drinking and Social Behaviour Survey

DRINKING & SOCIAL BEHAVIOUR SURVEY

First-year students living in Lansdowne or Craigdarroch residences are invited to participate in a survey of your opinions about drinking alcohol.

My name is Jennifer Maggs and I am conducting a survey about students' social behaviour and opinions about drinking. Your participation will help me to complete my degree in Psychology.

The surveys will be distributed by your residence advisors at floor meetings. All information you give will be completely confidential & anonymous.

For more information, call Jennifer at 721-8718 (days).

Thank you very much for your help!!

Appendix F

Information Sheet for Participants
Drinking and Social Behaviour Survey

QUESTIONS & ANSWERS ABOUT THE DRINKING & SOCIAL BEHAVIOUR SURVEY

WHO CAN PARTICIPATE?

All 1st year students living in residence. It doesn't matter how little or how much you drink.

HOW DO I PARTICIPATE?

Fill out the survey distributed by your RA. Seal it in the confidential envelope and return to your RA.

WHO WILL SEE MY ANSWERS?

The envelopes will be opened by Jennifer Maggs (Ph.D. student in psychology) who is conducting the survey. The consent forms and surveys will be separated immediately.

The survey is confidential and anonymous. The following people will **NOT** have access to your individual responses: your RA, anyone in Housing Services, the university administration, your parents, your professors. Only Jennifer Maggs and her research assistant(s) will compile the information. They will not know who gave particular answers.

WHY DO I NEED TO PUT MY NAME ON THE CONSENT FORM?

The purpose of the consent forms is to make certain that everybody who participates has read and understood their rights as a participant in scientific research. For legal and ethical reasons, your signature is needed to show this. However, the consent forms will **NOT** be stored with the surveys to protect your anonymity.

WHERE WILL THE RESULTS BE PUBLISHED?

A summary report will be written before the end of this school year. Please contact Jennifer Maggs if you would like a copy (721-8718). The full report (in the form of a Ph.D. dissertation) will go to the UVic library and the National Archives in Ottawa. A scientific paper will be published in a psychology journal. And, I plan to present the results at conferences in North America and/or Europe. So, your answers will contribute to an increased understanding of young adults' beliefs about alcohol use.

Appendix G

Measures of Experienced Consequences of Drinking

POSITIVE AND NEGATIVE EFFECTS OF DRINKING

Indicate how often each of these consequences happened to you as a result of drinking in the past 3 weeks.

0 = Never happened
1 = Happened once in 3 weeks
2 = Happened twice in 3 weeks
3 = Happened 3 times in past 3 weeks
4^{+} = Happened 4 or more times in past 3 weeks

	Number of times in past 3 weeks as a result of drinking				
1. Had more fun	0	1	2	3	4+
2. Ended up doing something stupid	0	1	2	3	4+
3. Felt close to your friends	0	1	2	3	4+
4. Showed people you drink	0	1	2	3	4+
5. Passed out	0	1	2	3	4+
6. Felt good	0	1	2	3	4+
7. Felt hungover	0	1	2	3	4+
8. It helped you cope with daily life	0	1	2	3	4+
9. Became more sociable	0	1	2	3	4+
10. Got a headache	0	1	2	3	4+
11. Didn't remember what you did or said	0	1	2	3	4+
12. Didn't get your work done	0	1	2	3	4+
13. Received a ticket for drinking & driving	0	1	2	3	4+
14. It helped you unwind	0	1	2	3	4+
15. Got sick to your stomach	0	1	2	3	4+
16. Got in a car accident	0	1	2	3	4+
17. You got to be with your friends	0	1	2	3	4+
18. Lost control of yourself	0	1	2	3	4+
19. Relieved boredom	0	1	2	3	4+
20. Gained weight	0	1	2	3	4+

Appendix G, cont.

	Number of times in past 3 weeks as a result of drinking				
21. Looked interesting to others	0	1	2	3	4+
22. Relaxed after a stressful situation	0	1	2	3	4+
23. Said things you didn't mean	0	1	2	3	4+
24. Showed people how much you can drink	0	1	2	3	4+
25. Became more relaxed	0	1	2	3	4+
26. You got to know new people	0	1	2	3	4+
27. It affected your coordination	0	1	2	3	4+
28. Shared in a group experience	0	1	2	3	4+
29. It helped you to maintain your wild image	0	1	2	3	4+
30. Reduced your eye/hand coordination	0	1	2	3	4+
31. Amused yourself	0	1	2	3	4+
32. Helped you get through an event	0	1	2	3	4+
33. Bonded with your friends	0	1	2	3	4+
34. Worried about driving safely	0	1	2	3	4+
35. Let off steam	0	1	2	3	4+
36. Got "the munchies"	0	1	2	3	4+
37. Didn't concentrate as well	0	1	2	3	4+
38. Became happier	0	1	2	3	4+
39. No one was sober enough to drive	0	1	2	3	4+
40. You seemed more exciting to others	0	1	2	3	4+
41. Were in bad physical shape next day	0	1	2	3	4+
42. Weren't able to be the "designated driver"	0	1	2	3	4+
43. Damaged your health	0	1	2	3	4+
44. Looked older to others	0	1	2	3	4+
45. Got in a fight	0	1	2	3	4+
46. Relieved tension	0	1	2	3	4+
47. Did or said something embarrassing	0	1	2	3	4+
48. Maintained your reputation	0	1	2	3	4+
49. Worried about causing an accident	0	1	2	3	4+
50. Had a good time	0	1	2	3	4+

Appendix G, cont.

Note. Items composing the experienced consequences subscales.

Fun:	Items 1, 6, 19, 31, 38, 50
Peer Experience:	3, 9, 17, 26, 28, 33
Relaxation/Coping:	8, 14, 22, 25, 32, 35, 46
Image/Reputation:	4, 21, 24, 29, 40, 44, 48
Physical:	5, 7, 10, 15, 20, 27, 30, 36, 41, 43
Behavioural:	2, 11, 12, 18, 23, 37, 45, 47
Driving:	13, 16, 34, 39, 42, 49