Motives for drinking, alcohol consumption,
and alcohol-related consequences in a Vancouver youth sample

by

Kimberly Ann McIntosh
B.A., Simon Fraser University, 2007

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of the Requirements for the Degree of

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in the School of Child and Youth Care

Supervisory Committee

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Abstract

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This longitudinal investigation examined motives for alcohol use, alcohol consumption, and alcohol-related consequences in a Vancouver, British Columbia youth sample (n = 405). Secondary analyses were performed on data that were collected at two time points (1995-1996 and 2003-2004). Sociodemographic variables included age, gender, adoption status, parent education, household moves, and family net worth. Bivariate correlations and structural equation modeling were used to examine associations between social, enhancement, and coping motives, alcohol consumption and alcohol-related consequences. The social motives included drinking to be sociable and drinking to add to the enjoyment of meals. Enhancement motives included drinking to feel good. Coping motives included: drinking to help you relax, drinking to forget worries, and drinking to feel less shy and inhibited.

In the final longitudinal structural equation model combining T1 motives and both T1 and T2 alcohol consumption and alcohol-related consequences, results showed endorsement at T1 of drinking to forget worries was predictive of the alcohol-related consequences latent factor at T1. Moreover, T1 consequences were predictive of alcohol-related consequences at T2. The data show a positive relationship between T1 endorsement of drinking to feel good and the alcohol consumption latent variables at both

T1 and T2, but no relationship between drinking to feel good and the alcohol-related consequences emerged. Additionally, the data yielded a negative relationship between the variable, “drink to be sociable” and the alcohol-related consequences latent factor at T1. Certain self-identified motives for drinking may be risk factors for continued alcohol use and subsequent misuse. Therefore, differentiating between specific motives for alcohol use may be a helpful marker for Child and Youth Care workers and other professionals to initiate conversations about alcohol use and consequences.

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Acknowledgments

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Chapter I: Introduction

What motivates Canadian youth to drink alcohol? Is there a relationship between the specific motives that youth have endorsed for drinking alcohol (cognitions), their alcohol consumption, and alcohol-related consequences? Do these motives change over time? Are there relationships between the motivational patterns that the youth endorse for drinking and their consumption at a later date? Alcohol misuse in Canada is a complex social issue that needs to be viewed in a multi-faceted way in order to gain an understanding of the development of alcohol problems. The repercussions of alcohol abuse on our society are staggering, not only because of the economic costs ($39.8 billion in 2002, in direct and indirect costs), but also because of the impact of excessive alcohol consumption on the health and well-being of Canadians (Rehm et al., 2006).

Young people are the most likely group to experience harm as a result of risky drinking behaviors and youth substance abuse is problematic because substance use behaviors that are established during adolescence have been shown to have an impact on alcohol misuse in adulthood (Canadian Centre on Substance Abuse, 2007). Still, the majority of adolescents experiment with alcohol and make the transition to adulthood without becoming alcohol dependent (Brown et al., 2009). Therefore, in order to know how to help the group of young people who are at risk for becoming alcohol dependent, we need to know how to differentiate between those who are unlikely to become problem drinkers and those whose alcohol consumption could well lead to problem drinking in adulthood. Understanding the young people's motivations for drinking and the connection between motivation and alcohol consumption could help us better

comprehend the trajectories of alcohol use in order to develop harm reduction and treatment programs that best meet the needs of Canadian youth and their families.

Outline of thesis

This opening chapter introduces the research questions that will be examined throughout this thesis. Chapter I contains a definition section which sets up concepts which are referred to throughout this research and introduces contested terms within the motivational literature. A brief section on the rationale for this study is introduced, however more information is included in Chapter II. This chapter ends with an outline of the specific objectives of this research.

Chapter II provides an overview of the literature into the motives for drinking. These motives include enhancement, social, coping, and conformity motives. In Chapter II, the motives for drinking literature and relevant sociodemographics such as gender, age, and adoption status are discussed along with the rationale behind the selection of those variables. A section on alcohol-related consequences is included and the chapter also offers a discussion of other research that has examined the associations between alcohol motives and harmful consequences.

Chapter III sets out the methodology of this cross-sectional and longitudinal research. In Chapter III, each measure and scale that was used in this secondary analysis is detailed and the design of the study is described. This chapter contains information on the process of data analysis and I break down the step-by-step procedures that were followed.

I present and detail the results of my research in Chapter IV. This chapter contains descriptive statistics of the sample, information about consumption patterns at both T1

and T2, tables displaying the correlational relationships between the variables, and the structural equation model results.

Chapter V summarizes the findings of this study. Each motive is individually examined at the two time points and the overall combined model is closely scrutinized. In this section, the results are compared to the applicable motives for drinking literature.

The final chapter of this thesis (VI) contains a discussion of the strengths and limitations of this research, a section on the implications of these findings and concluding comments. Chapter VI includes a brief discussion on future avenues for this area of research.

Research location

Substance use is multidimensional and includes an interplay of behaviors, attitudes, expectancies, and motivations. Our understanding of substance use needs to be informed by more than an understanding of who consumes how much. In order to more effectively assist with problem drinking, we need to grasp the role of motivation and context, the rationales and impetus of consumption (Patrick, Schulenberg, O'Malley, Johnston, & Bachman, 2011). This thesis examines cognitive motives for engaging with alcohol at an individual level and acknowledges that "people obviously do not drink alcohol just because it is available, but because it affects their bodies, it has situational meanings and it relates to cultural settings. It is not only alcohol as a substance in itself that produces desire, but the whole setting is drawn in" (Oksanen, 2010, p. 8). Nonetheless, I recognize that motivational understanding is only one piece of the larger picture of alcohol consumption that may include factors that are genetic, cultural, historical, and political that also contribute to the problematic use of substances.

Definitions

To begin with, within the alcohol use and motivation literature, many studies use the Diagnostic and Statistical Manual of Mental Disorders, 4th edition revised (DSM-IV-TR; American Psychiatric Association, 2000) to determine whether or not a person meets the criteria for alcohol dependence or alcohol abuse. In order to meet the DSM-IV-TR criteria for alcohol dependence an individual must meet three of seven indicators, which include tolerance for alcohol and withdrawal symptoms occurring within a 12-month period. The criteria for alcohol abuse include any harmful use of alcohol that leads to significant distress or impairment within a 12-month period. Various studies collapse the two terms of alcohol dependence and alcohol abuse, as it has been shown that family histories of both abuse and dependence increase the risk that the offspring will encounter problems with alcohol (Hartman, Lessem, Hopfer, Crowley, & Stallings, 2006). This study did not use DSM-IV-TR criteria, as the measures were self-administered which means that clinical indicators were not used. Therefore, the terms alcohol abuse and alcohol dependence will not be employed. Instead, I refer here to identified problems with alcohol which were determined by endorsement of questions on the CAGE scale, the brief MAST scale, and questions about alcohol-related consequences. Each of the alcohol scales will be described in the Chapter III.

Researchers are beginning to conceptualize alcohol use on a continuum (Krueger et al., 2004; Hagman & Cohn, 2011; Beseler, Taylor, & Leeman, 2010). Figure 1 represents recent developments in the conceptualization of substance use in British Columbian health policy (BC Ministry of Health Services, 2004; City of Vancouver Drug Policy Program, 2005; BC Ministry of Health Services, 2010). Within the context of this

study, self-identified alcohol problems will be considered to be within the problematic and chronic dependent side of the continuum.

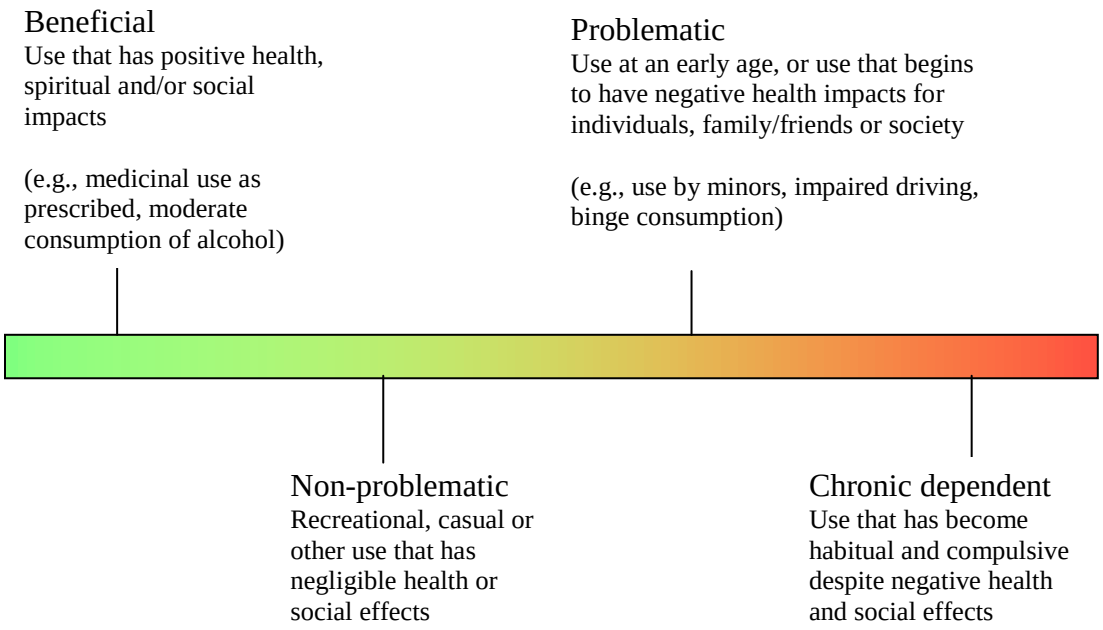

Figure 1. Spectrum of psychoactive substance use

Other common interchangeable terms in the drinking behavior literature include "binge drinking," or "heavy episodic drinking" and these terms are defined differently across studies. Some studies define heavy episodic drinking as the consumption of four or more drinks on one occasion for females and five or more drinks on one occasion for males. Other studies do not distinguish between genders and define heavy episodic drinking as five or more drinks at one sitting. Thus, these studies may not classify females who drank four drinks on one occasion as heavy episodic drinkers.

I chose to use the term "heavy episodic drinking" as opposed to "binge drinking" when reviewing the literature because some authors have argued that the term "binge"

implies that a person is consuming alcohol over a number of days as opposed to a single occasion of heavy alcohol use (Lederman, Stewart, Goodhart, & Laitman, 2003; Alberta Alcohol and Drug Abuse Commission, 2005). I will clarify how the authors define heavy episodic drinking by indicating the quantity of drinks and time frame of drinking when possible. It should be noted that in this study, there is a "heavy drink" variable which was not meant to capture the same group as the heavy episodic drinkers referred to in the current literature. Instead, this variable was intended to capture participants who had consumed eight or more drinks at one sitting and were on the problematic end of the alcohol use continuum. Information about this variable is further detailed in Chapter III.

Another definitional distinction is between the terms "motives" and "reasons" with regard to alcohol use. Comasco, Bergland, Oreland, and Nilsson (2010) make the distinction between the two terms by using the term *motives* as a part of a broader classification that includes the unconscious or conscious reasons a person engages in behavior toward a goal. In their view, motives influence behavior. Comasco et al. describe *reasons* as being more specific in that it is not part of a larger classification system. This study will use the term alcohol motives because participants were not asked to provide their own personal reasons for alcohol use; instead they were asked if specific motives were applicable to their drinking behavior. The motives for alcohol use were classified using three parts of a four-factor model based on research by Cox and Klinger (1988).

Lastly, within this alcohol literature the term "expectancy" is frequently used. This refers to the beliefs that an individual holds regarding the consequences of using alcohol or the positive or negative effects of alcohol (Engels, Wiers, Lemmers, &

Overbeek, 2005; Handley & Chassin, 2009). Cooper (1994) argued that expectancies should be considered separately from motivations because even though a person may expect alcohol to affect them in a certain way, they may not actually be motivated to consume that alcohol. This study did not question the expected effects of alcohol; instead it examined the actual outcomes people hoped to obtain when they consumed alcohol.

Description of problem/issue

It has yet to be seen whether youth motivations for drinking remain consistent over time and whether those motives are linked to consumption. By focusing on the motives that lead a person to drink, we can gain a better understanding of the circumstances in which that person will most likely drink, determine what those consequences of their drinking may be, and then tailor the therapeutic intervention to the individual (Cooper, 1994; Kuntsche, Knibbe, Engels, & Gmel, 2010). The individual alcohol motives will be further discussed in the literature review (Chapter II).

Rationale

According to the Canadian Community Health Survey (Statistics Canada, 2002), 6.97% of young persons aged 15 to 24 residing in the 10 Canadian provinces reported symptoms that classify them as dependent on alcohol. This designation used the clinical indicators for alcohol dependence from the DSM-IV, and was based on the previous 12 months, which means that the criteria were different than the current study, which encompasses self-identified alcohol problems. However, this statistic still shows that there are Canadian adolescents dealing with alcohol problems in their daily lives. While the Canadian Community Health Survey excluded the three Canadian territories, there is reason to believe that the prevalence of substance misuse in the territories is significantly

higher. The NWT Addictions Report (2010) stated that in the previous year, 77% of the residents of the Northwest Territories aged 15 and older reported consuming alcohol. In 2009, the amount of alcohol consumed on a single occasion by 15- to 24-year-olds increased with 64% of the current drinkers reported consuming five or more drinks at one sitting.

It is clear that youth heavy episodic drinking (as defined by consuming five or more drinks at one sitting) in Canada is a problem, as it is associated with higher injury rates and other unsafe behaviors such as unprotected sex (potentially leading to unwanted pregnancies, or sexually transmitted diseases), drunk driving, and association with risky peers (McCreary Centre Society, 2004; Barnes, Mitic, Leadbeater, & Dhami, 2009). In the United States, approximately one-third of unintentional injuries are alcohol-related (Hingson, Heeren, Jamanka, & Howland, 2000) and heavy episodic drinking is associated with violence-related outcomes such as injury to oneself, property damage, verbal arguments, and involvement with law enforcement (Powell, Ciecierski, Chaloupka, & Wechsler, 2002). Therefore, gaining an understanding of what motivates young people to drink may help to create targeted harm reduction programs and inform treatment resources.

With regard to drinking motives, Cooper (1994) suggests that more research needs to look at the youth drinking motivations as potential predictors for drinking trajectories later in life. Further, there are conflicting reports about the role of gender and whether or not there are differences between biological and adopted youth. These issues are discussed in subsequent sections of the literature review (Chapter II). The Vancouver

Family Survey (VFS) data allows us to look at those specific issues. Do drinking motives remain consistent across time?

Context

My focus for this research is to examine secondary substance use data that were collected in Vancouver, British Columbia, as part of the Vancouver Family Survey (hereinafter referred to as the VFS). The details of the VFS are included in the methodology section of this thesis (Chapter III).

Research questions

Guiding questions for my research include: Can drinking motives be predictors for drinking habits later in life? Using longitudinal research data, do youth motives for drinking at Time 1 (T1) prospectively predict alcohol consumption at Time 2 (T2)? Do adopted youth differ from biological youth in their motives for drinking? And lastly, do males and females differ in their motives for drinking?

I will investigate the relationship between motives for drinking (cognition), drinking behavior, and alcohol-related harm (see Figure 2). It is hypothesized that if an individual is more likely to endorse specific motives for drinking, it will subsequently affect their consumption and will potentially predict more alcohol-related consequences.

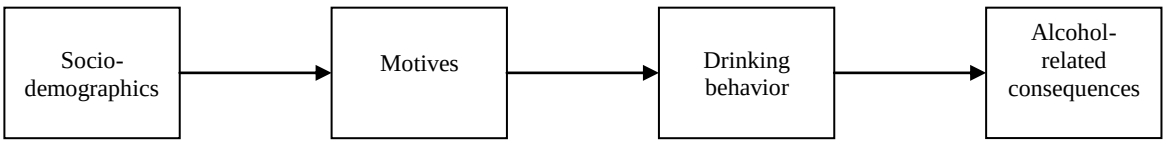

Figure 2. The hypothetical relationship between cognition, drinking behavior, and alcohol-related consequences.

From the VFS dataset, I examined the youth endorsed motives at both T1 and T2 (see Figure 3). I also investigated the relationships between biological and adopted youth and males and females and their motives for drinking. As depicted in Figure 3, the motives at T1 were examined in relation to the motives at T2. I looked at alcohol consumption at both time points, along with alcohol-related consequences.

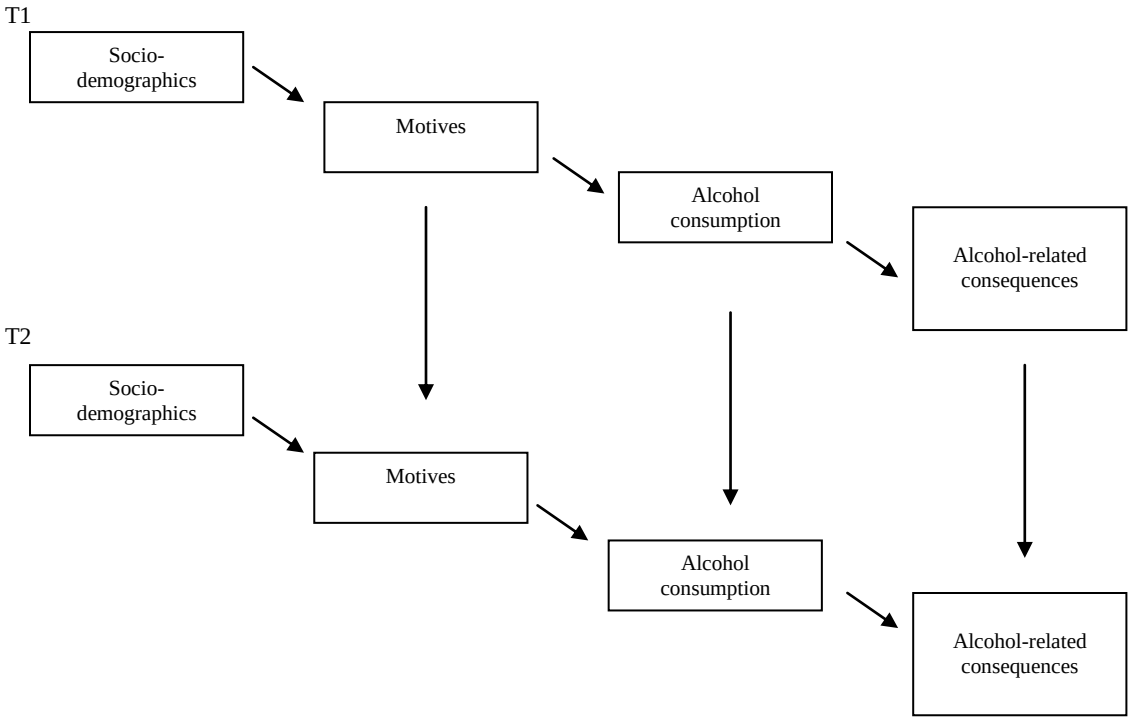

Figure 3. The overall hypothetical model for T1 and T2.

Each of the motives was examined separately cross-sectionally and over time. In addition, the specific youth motives at T1 were examined in relation to alcohol consumption at T2 (see Figure 4).

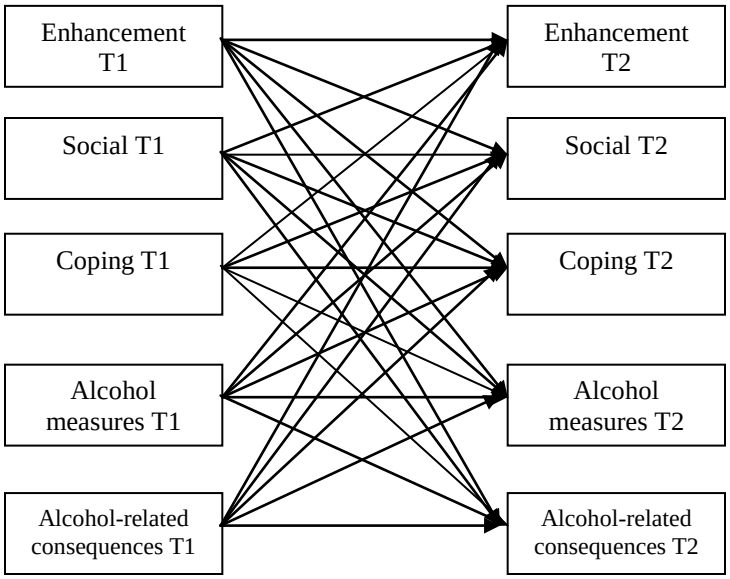

Figure 4. The hypothesized combined prospective T1 and T2 model with the breakdown of the specific motives for drinking.

Specific research objectives were:

1. To examine the relationships between socio-demographic factors (including age, gender, and adoption status), motives for drinking, alcohol consumption, and alcohol-related consequences in the youth sample at T1.
2. To examine the relationships between socio-demographic factors (including age, gender, and adoption status), motives for drinking, alcohol consumption, and alcohol-related consequences in the youth sample at T2.
3. To examine the youth motives for drinking at T1 in relation to youth motives for drinking at T2.
4. To examine the combined effects of socio-demographics, motives for drinking, alcohol consumption, and alcohol-related consequences and

build a predictive model explaining the development of heavier drinking and alcohol-related consequences over time.

Chapter II: Review of the Literature

In preparation for the literature review, the author used the University of Victoria's academic search engine, Summon, to find relevant scholarly books and articles. Combinations of keywords such as *substance use, alcohol use, drinking, adolescent, youth, motives, reasons, consumption, and alcohol-related consequences* were used to find applicable studies. The author aimed to include the most recent studies that examined some part of Cox and Klinger's (1988) four-factor motivational model of alcohol use. Due to the staggering amount of adolescent substance use literature, only studies that used similar measures were included, specifically studies that examined coping, conformity, social, or enhancement motives.

This review of the literature is organized into two parts, reflecting the various pieces of the model and the theoretical perspectives that informed those components. The two sections include: (a) the motives for drinking (cognition) literature including age, gender, and adoption status literature; and (b) the alcohol-related consequences literature. The demographic questions included in this study were age, gender, whether or not the youth was adopted, reported family net worth by both of the individual's parents at T1, household moves the family had made in the previous year as reported by both the mother and the father, and parent years of education. Common variables were the community location, language, and the fact that the sample consisted of intact families only. Information about the Vancouver Family Survey can be found in the methodology section of this thesis.

Motives for drinking literature

The basic underlying theory of the motives or motivations for drinking literature is that people drink to gain positive outcomes or to avoid negative consequences (Cooper, 1994). Cox and Klinger (1988) proposed a four-factor model that posits that motivations for drinking can be categorized by valence (positive or negative) and by either internal or external sources of the outcomes a person wishes to achieve by using alcohol. For example, Cox and Klinger purported that an individual could be motivated to drink by having positive external rewards such as social acceptance, or negatively reinforced external rewards such as drinking to avoid social rejection. On the other hand, a person could be internally motivated to drink to enhance a desired emotional state such as drinking to enhance a positive mood, or alternatively, an individual can drink to reduce negative moods. Thus, in Cox and Klinger's model, four dimensions of motives are brought forth: social motives, conformity motives, enhancement motives, and coping motives. Other authors have brought forth the dimensions that alcohol use can be either socially integrative or alienating (Neff, 1997).

Many cross-sectional studies have looked at the relationship between each specific motive for drinking and alcohol consumption and harm. Kuntsche, Knibbe, Gmel, and Engels (2005) summed up the drinking motives literature by noting that most adolescents report drinking for social motives, fewer endorse enhancement motives, and only a limited few endorse coping motives. With relation to outcomes, Kuntsche et al. (2005) report that social motives seem to be linked with moderate consumption, enhancement motives with heavy use, and coping motives with alcohol-related problems.

I examine each of the motives and report on the relevant literature in the following sections.

Enhancement motives.

Enhancement motives, which are internal and positively reinforced, include drinking to feel good, drinking to have fun, and drinking because you like the feeling. In a Swiss study looking at risky single-occasion drinkers (defined as drinking five or more drinks at one sitting) with youth aged 12 to 18 (mean = 15.2 years) who endorsed enhancement motives, Kuntsche, Knibbe, Engels, and Gmel (2010) found that these youth had better social relationships, tended to enjoy social outings, went out more frequently, and had more friends who were drinkers than youth who they classified as coping drinkers. There were more adolescent males in the enhancement group and this group tended to be older than the youth who endorsed coping motives for drinking. In terms of prevention efforts, the authors suggested targeting enhancement drinkers by focusing on social influences, by promoting safe drinking environments, or by providing alternative sources of stimulation (Kuntsche et al., 2010).

Kuntsche and Kuntsche (2009) found that enhancement motives were endorsed more often than the coping and conformity motive dimensions (but not the social motive dimension). They found that older adolescent males selected enhancement (and social motives) more often than younger males and compared to females of any age. Their structural equation models confirmed that the enhancement dimension was the dimension that was most closely associated with heavy episodic drinking. Limitations of this study included a lack of data regarding quantity of consumption. The youth were asked about how often they were drinking and how often they were drunk but they were not asked

about specific quantities of alcohol that they had consumed. This may mean that one is classified as a heavy drinker due to frequency of drinking, but the amounts consumed may be less than other people.

Contrary to the Kuntsche and Kuntsche (2009) study, in a study involving Hungarian music festival attendees, Nemeth, Kuntsche, Urban, Farkas, and Demetrovics (2010) found that enhancement motives were the least likely to be endorsed compared to the other three dimensions. These authors found no gender differences on this dimension. Further, due to the setting of the data collection, the festival goers were older (mean age 23.6, *SD* = 4.4, age range 12-77 years) than the samples from the other studies (Cooper, 1994; Kuntsche & Kuntsche, 2009) and the participants in this study had higher incomes.

In relation to alcohol-related issues, Kuntsche, Knibbe, Gmel, and Engels (2006a) found that people who were drinking for enhancement motives had the most problems that were attributed to alcohol use. These problems included fighting due to drinking, damaging clothing or objects that the individual owned due to alcohol use, being victimized by robbery or theft due to alcohol consumption, engaging in sexual intercourse that the individual regretted the next day, or engaging in sexual intercourse without a condom. In this study, drinking to get drunk resulted in the most alcohol-related consequences, compared to drinking for social or conformity motives, which were not associated with alcohol-related consequences. Additionally, the authors included academic problems, which were classified as non-alcohol related problems. They found that individuals who were drinking for enhancement motives did not score significantly higher on academic problems than individuals who were not drinking for enhancement purposes. Kuntsche et al. (2006a) concluded that even though individuals who are

drinking to get drunk report more alcohol-related problems, they do not have more problems in their lives that are not related to alcohol (academic problems). However, it should be noted that academic problems were the only non-alcohol related problems included in this study. Including problems related to larger social issues such as poverty, violence, and mental health may have strengthened this study, and may be areas that future alcohol motives research can address.

Social motives.

Social drinking motives include drinking to help you enjoy a party and drinking to make social gatherings more fun. In the Hungarian festival goers study (Nemeth et al., 2010), the social motives dimension was the only dimension that was significantly correlated with drinking frequency. As the data were collected in a recreational setting, this context may have played a large part determining which dimensions were endorsed, as drinkers who are more internally motivated and less social drinkers may not attend such events. Additionally, the range of ages with the festival goers was between 12 and 77 years.

In a sample of adolescents (mean age = 14.7 years, *SD* = .84), Kuntsche and Kuntsche (2009) found that the youth endorsed the social motives most often. Schelleman-Offermans, Kuntsche, and Knibbe (2010) found that youth (mean age = 14.8 years, *SD* = .78) more strongly endorsed social and enhancement motives rather than coping and conformity motives. In their longitudinal model, social motives were determined to be the best predictor for consumption and frequency of heavy episodic drinking (which was defined by the frequency of drinking more than six glasses of alcohol at one sitting). The authors pointed out that their finding with regard to the social

dimension being the best predictor of heavy consumption was not consistent with North American literature where social motives are associated with moderate drinking (Schelleman-Offermans et al.). They concluded that the "wet" environment in the Netherlands may contribute to the social acceptance of heavy episodic drinking.

In prospective analyses as part of a longitudinal study by Bradizza, Reifman, and Barnes (1999) that examined social and coping motives, the authors found that social motives predicted alcohol misuse. The Buffalo, New York sample consisted of youth aged 13 to 16 (210 black families and 489 Caucasian families). They found that coping motives were not predictive of alcohol misuse. Alcohol misusers in this study were classified as consuming two to four drinks at least once per week, consuming more than five drinks on one occasion in the past year, and being drunk at least once in the past year. The authors hypothesized that the young age of 13 may mean that the individuals are drinking for more social motives when they do decide to drink. The definition of alcohol misuse that the authors used was described by them as "moderately heavy use," but the context of that definition was not provided (for example in relation to the DSM-IV-TR).

Coping motives.

Coping motives include drinking to help relax oneself, and drinking to forget problems or worries. Labouvie and Bates (2002) describe coping motives as suppression reasons for drinking, which may be used to avoid thoughts that create negative feelings. In their longitudinal study that followed participants over a 13-year period, data from T4 were used to examine coping patterns and alcohol use (participants aged 25, 28, and 31

years, *n* = 1,176). They found that suppression reasons had a direct effect on alcohol use problems, in other words on alcohol-related harm, and the intensity of alcohol use.

In a study (*n* = 481) with Anglo-American, African-American and Mexican-American males aged 20 to 50 years, Neff (1997) found that the more socially isolated the individuals were, the more likely they would engage in "escape drinking." Anglo-American males endorsed escape motives more often than African-American and Mexican-American males. However African-American men were more likely to endorse solitary drinking compared to the other two groups. The combination of escape drinking and social isolation led to the greatest consumption of alcohol. Further, escape drinking was significantly related to the drinking measures (quantity and frequency of drinking).

In a Swiss study by Kuntsche, Knibbe, Engels, and Gmel (2010), 12- to 18-year-old students were classified into two groups: enhancement drinkers or coping drinkers. These authors found that coping drinkers were more likely to have unsatisfactory relationships with family and friends as measured by a Likert–scale question that asked "How satisfied are you usually with your relationship to your (1) mother, (2) father, and (3) friends?" Teens who endorsed coping motives were likely to have fewer drinking peers and they were more likely to drink at home. The authors used the differences between coping drinkers and enhancement drinkers to highlight the importance of targeted interventions that do not treat all heavy episodic drinkers in the same manner.

In another study, Kuntsche, Knibbe, Gmel, and Engels (2006a) not only asked their participants about their problems with alcohol but also about their other life problems that were not attributed to alcohol. They found that the young individuals that

were drinking to cope also had the most life problems, such as risky sexual behavior or poor academic performance.

However, Schelleman-Offermans et al. (2010) used all four motive dimensions in their longitudinal structural equation model that measured the motivations of Dutch adolescents (aged 13 to 16) at two points in time. They found that the coping motivation was the only dimension that did not significantly increase over time.

Conformity motives.

Conformity motives include drinking because friends pressure them to drink, drinking so that others won't kid them for *not* drinking, and drinking to fit in with the group. Cooper (1994) found that conformity motives were negatively associated with both drinking frequency, drinking quantity (five or more drinks at one sitting), and heavy drinking (including frequency of drinking five or more drinks and frequency of drinking to intoxication). However, conformity motives were positively correlated with drinking problems within the past six months (in which the respondents' self-assessed problems that they had experienced within the past six months related to drinking such as issues with parents, friends, dating partners, at work or at school). The author included a drinking context variable and found that teens that endorsed conformity motives were most likely to drink at parties as opposed to drinking at bars or at home, reflecting an environment where pressure to conform may be heightened. Cooper reconciled the inconsistency between teens that endorsed conformity motives and tended to drink less when they drank, yet had drinking problems, by explaining that "despite this pattern of light, infrequent drinking, again suggesting that among individuals who drink equal amounts, drinking to conform places one at increased risk of experiencing problems

relative to those who drink primarily for social or enhancement motives" (p. 126). The pressure of having to fit in may indirectly play a role in the development of drinking problems.

In their study of Swiss youth, Kuntsche et al. (2006a) also found that conformity motives were negatively associated with frequency of alcohol use. However in contrast to the Cooper (1994) study, they did not find an association between conformity motives and alcohol-related problems such as alcohol-related violence or risky sexual behavior.

Gender in the drinking motives literature.

There are conflicting reports with regard to the role of gender in the motivations for drinking literature, which generally reflects the gender inconsistencies in alcohol research. For example, in a Swedish study by Comasco et al. (2010), the authors found that there were no gender differences in drinking motives, alcohol consumption, or problems with alcohol. The authors attributed this to the cultural environment of Sweden in which female youth tend to show the same drinking patterns as young Swedish males. Kuntsche et al. (2006a) did not find gender differences in their four-factor model of drinking motives in a Swiss sample. Similarly, in a North American sample, Molnar, Sadava, DeCourville, and Perrier (2010) found no sex differences in their model using both clinical and university student samples that looked at attachment anxiety and avoidance in relation to the drinking motives and alcohol-related consequences. McCabe (2002) also found gender similarities for participant responses on his study of two of the motives for drinking (i.e., drink to get drunk and drink to reduce negative affect) and heavy episodic drinking, with 2,041 U.S undergraduate college students. Patrick et al.

(2011) also did not find differences between males and females in their associations between alcohol motives, alcohol use, and outcomes.

On the other hand, Nemeth et al. (2010) found that male Hungarian festival goers endorsed social, coping, and conformity motives more than women. These authors stated that "effect sizes of gender differences indicate small but substantial effects because Cohen *d*-values vary between 0.26 and 0.33, with the exception of the enhancement motive (effect size was negligible, 0.04)" (p. 44). Moreover, Cooper (1994) reported that men were more likely than women to endorse social, enhancement, and conformity motives. In a review of drinking motives research, Kuntsche, Knibbe, Gmel, and Engels (2006b) found that university-aged social enhancement drinkers tended to be men. However, they concluded that gender differences do not seem to emerge until later adolescence. In a Canadian study, Comeau, Stewart, and Loba (2001) found that adolescent girls scored higher on conformity motives than adolescent boys; however, there were no gender differences found in coping or enhancement motives.

Age in the drinking motives literature.

In their review of the literature, Kuntsche et al. (2006b) found that the distinction between the four motive categories does not emerge until early adolescence. According to one study (Webb, Getz, Baer, & McKelvey, 1999), fifth graders did not perceive coping motives and social motives for using alcohol as separate, whereas the sixth graders in their sample did. In terms of conformity motives, Cooper (1994) found that younger adolescents more strongly endorsed those items compared to older youth. Cooper divided the youth into three age groups (under 15, 15 to 17, and over 17) and found that older youth were more likely to select social, coping, and enhancement

motives. Kuntsche et al. (2006a) found that there were no age differences in drinking motives when they looked at a sample of European students aged 12 to 18.

In a U.K. study of secondary students aged 13 to 18 by Cox, Hosier, Crossley, Kendall, and Roberts (2006), the authors found that age was not related to drinking motives, consumption or alcohol-related problems. However, this study also looked at a sample of university students and the authors concluded that the sample of secondary-school students appeared to have a different pattern of drinking compared to the university students. The secondary students' negative motives for drinking and higher weekly alcohol consumption better predicted alcohol-related problems than the endorsement of positive motives (Cox et al.). The authors concluded that negative motives predicted drinking-related problems more significantly than positive reasons did regardless of age group. Further, they also noted that younger students seemed to differentiate less between the motives for drinking as their alcohol consumption seemed to predict alcohol-related consequences more than their motives for use. The authors posited that the older cohort seemed to have more established motives for alcohol use as their motives developed from generic ideas about alcohol use to become more specific.

Summary of the motives for drinking literature

The majority of studies in the motives for drinking literature were cross-sectional studies designed to analyze the associations between individual adolescent motives and alcohol consumption. Within the available longitudinal studies, conflicting research exists. The longitudinal adolescent study by Schelleman-Offermans et al. (2010) supported the hypothesis that drinking for social reasons best predicted consumption and frequency of using alcohol. These authors noted that the drinking motives appear to be

fairly stable in adolescence and seem to develop from external motives to internal drinking motives. Alternatively, in their longitudinal study with college-age students, Read, Wood, Kahler, Maddock, and Palfai (2003) did not find evidence that the four individual motive domains directly contributed to alcohol use but they argued the usefulness of categorizing the motives more generally as positive or negative alcohol motives. Overall, there is an unclear pattern within the limited number of longitudinal studies, especially because each study uses a different combination of the motive questions and alcohol consumption measures.

In the drinking motives literature, internally motivated people (especially those with coping motives) tended to drink more frequently and consume more alcohol (Cooper, 1994; Kuntsche et al., 2006a; Molnar et al., 2010). Overall, the drinking motives literature suggests that distinguishing between groups of people that use alcohol based on their motives, in order to create suitable treatment options, might be a valuable way to prevent alcohol misuse.

Adoption, alcohol use, and drinking motives

There are conflicting reports in the adoption status and drinking literature. Some studies conclude that there are moderate differences in drinking behaviors between biological and adopted youth, with adopted youth drinking more frequently and getting drunk more often than biological youth (Miller, Fan, Christensen, Grotevant, & van Dulmen, 2000) while other studies (Tully, Iacono, & McGue, 2008; Wadsworth et al., 1997) did not support moderate differences. Prior research using the VFS dataset found that adopted youth were at a higher risk for misusing substances, including alcohol (Seamone & Barnes, 2005). However, most researchers agree that it is most likely a

combination of genetic, environmental, and individual factors (e.g., physiological sensitivities) that affect a person and their decisions to use alcohol.

Although some research has examined higher-risk families and their drinking motives (i.e., Chalder, Elgar, & Bennett, 2006), there appears to be a lack of research that looks at biological and adopted youth and their drinking motives. In their study with higher-risk families that examined drinking motives, Chalder et al. (2006) found that children from families with alcohol problems showed greater coping and enhancement motives (internalizing motives) compared to those families without alcohol problems. Children from families with alcohol problems tended to drink more to reduce or regulate negative emotions and to feel drunk or enhance their mood.

In the current study, it is hypothesized that adopted youth will score higher on the alcohol consumption variables and will endorse the high-risk alcohol motives (such as drinking to cope with problems) more often.

Alcohol-related consequences

In their model that included attachment anxiety, Molnar et al. (2010) hypothesized that drinking and coping motives would be directly related to alcohol-related harm. The findings supported their hypothesis and they found that conformity motives also predicted alcohol-related consequences independent of alcohol consumption. Their findings are interesting as it suggests that motives may affect alcohol-related consequences directly rather than being mediated by alcohol consumption. Martens, Cox, and Beck (2003) encountered similar results in their study on college athletes that found that drinking for negative internal and external reasons was predictive of alcohol-related consequences. These consequences ranged from performing

poorly on a test, vomiting, or missing a class to being taken advantage of sexually, or being hurt or injured. The authors suggested that the motives predicted negative consequences with the strength of the relationship varying from consequence to consequence. However, the coping scale in particular had the strongest relationship to all of the negative consequences.

Comasco et al. (2010) examined motives for drinking and problems due to alcohol use. The problems included fighting, accidents, losing valuable items such as money, damaging items of clothing or objects, taking objects or other valuable items, problems with parents or friends, problems with academic performance, risky sexual behavior, risky driving, and trouble with the police. The authors found that social, enhancement, and coping domains were positively associated with those alcohol-related problems. The authors did not examine conformity motives in this study.

Need for further research

Patrick et al. (2011) noted that associations between motives for drinking alcohol and alcohol use are based almost exclusively on cross-sectional research. And Kuntsche, et al. (2006b) called for researchers to use longitudinal designs with respect to the motives for drinking research. The strength of the VFS dataset is that the potential associations can be tested over time with a biological and adopted sample. Additionally, this model can be tested to see if alcohol-related consequences relate to the motives for drinking. Room (2000) called for researchers to "return to a separation between drinking behavior, cognitions about drinking, and adverse consequences of drinking" (p. 109). This study separates the categories into drinking motives, drinking behavior, and alcohol-related consequences.

Chapter III: Methodology

Overview of the study design

In this study, two waves of data from the Vancouver Family Survey were used. The Vancouver Family Survey (VFS) was a longitudinal study that aimed to examine substance use patterns and behaviors in the context of their family environments, which included both biological and adoptive families. The VFS interviews were conducted at two different time points with T1 collected from 1995-1996 and T2 collected from 2003-2004. All data were collected in the Greater Vancouver region of British Columbia.

In 1995, the Vancouver Family Survey's original study proposal aimed to screen more than 100,000 families with hopes of recruiting 450 biological families and 150 adoptive families. Initially, a telephone directory was used to identify both biological and adoptive families in an effort to find a sample of intact families with children aged 15 to 24, who were residing within the same household. Only intact families were included in order to analyze the impact of both the mother and father on the development of the child. For the original sample, the adoptive families were included if the adoption occurred prior to two years of age. Fluency in English, as evidenced by the ability to complete the questionnaires, was the only other requirement in addition to the family composition.

This screening process found a large number of eligible biological families (n = 5,120). Unfortunately, this initial process of participant recruitment did not produce the targeted amount of adoptive families, with only 177 adoptive families determined to be eligible. Subsequently, the screening process was adjusted to relax the guidelines around the age at adoption. The adoptive families were included if the age at adoption was prior

to five years as opposed to two years. Further, the screening process for adoptive families was very costly for the researchers, so the recruitment strategy for the adoptive families was changed to include newspaper advertisements and referrals as well as the telephone directory. An additional 57 adoptive families were found with this expanded method of recruitment. The final T1 sample had a total of 473 biological families and 128 adoptive families for a total of 601 families. Families were paid $50.00 for their participation. At T2, 405 of the original 601 youth completed questionnaires. This study used the data from the 405 youth that completed both the T1 and T2 questionnaires.

Interviewers were present in the family homes to explain the survey and provide the youth and their families with the self-administered measures. However the youth were left alone to complete the questions. The interviewers ensured that the youth and their parents were not sharing information while completing the surveys.

Ethical considerations

Prior to conducting the research, ethical approval for analyzing secondary data was obtained from the Human Research Ethics Board at the University of Victoria.

Measures

Table 1 displays the key variables and measures that were used in this study along with the confounding variables that were examined.

Table 1. *Summary of key variables to be used in data analysis*

Motives for drinking	Drinking behavior	Alcohol-related consequences
Drink to be sociable? Drink to add to the enjoyment of meals? Drink to feel good? Drink to help you relax? Drink to forget worries? Drink to feel less shy and inhibited?	Daily average alcohol consumption Heavy drink (more than eight glasses of wine, beer, or liquor)	Alcohol-related harm scale Michigan Alcohol Screening Test (MAST) scale scores CAGE scale scores

Potential confounding variables

- Age
- Gender
- Self-reported family net worth (as reported by both mother and father)
- Parent years of education (as reported by both mother and father)
- Household moves in last year (as reported by both mother and father)
- Adoption status

Motives for drinking.

The questions pertaining to the motives for drinking in this survey originated from Canada's Alcohol and Other Drugs Survey (Health Canada, 1994). Participants in the VFS were asked six dichotomous yes or no questions about their motives for drinking. Youth respondents were asked: Do you drink to be sociable? Do you drink to add to the enjoyment of meals? Do you drink to feel good? Do you drink to help you relax? Do you drink to forget worries? Or do you drink to feel less shy and inhibited? As per the drinking motives literature, drinking to be sociable and drinking to add to the enjoyment of meals can be characterized as social motives. Drinking to feel good can be characterized as an enhancement motive. Drinking to help relax, drinking to forget worries, and drinking to feel less shy and inhibited can be classified as coping motives. In this study, no questions were asked reflecting conformity motives.

Daily average alcohol consumption.

The daily average alcohol consumption was measured via the Volume-Variability Index (Cahalan & Cisin, 1968). This measure contains questions regarding the quantity and frequency of wine, beer, and liquor consumed over the previous 12-month period. Based on the responses, a scale measuring daily average alcohol consumption was created.

Brief Michigan Alcohol Screening Test (MAST).

The brief MAST (bMAST) (Pokorny, Miller, & Kaplan, 1972) is a ten-question screening tool that measures drinking-related behavior. The scores range from 0 to 29. The questions vary from "Have you ever gotten into trouble at work because of your drinking?" to "Have you ever gone to anyone for help about your drinking?" (Pokorny et

al.). See Appendix A for a copy of the test. The bMAST is a widely used tool that assesses the lifetime prevalence of alcohol dependence through questions about the social and medical consequences of a person's drinking. In the context of this study, the bMAST was used to indicate the severity of problems with alcohol, not alcohol dependence. Therefore, the cut-off scores were not used. Instead, it was presumed that a higher score on the bMAST would indicate higher problems with drinking.

Many studies have been conducted using the bMAST, particularly in clinical and research settings (Connor, Grier, Feeney, & Young, 2007). Some researchers have found that the bMAST has a low sensitivity in general inpatient settings (Soderstrom et al., 1997), but a high specificity when patients are dependent on alcohol (Hearne, Connolly, & Sheehan, 2002; Chan, Pristach, & Welte, 1994b). This is most likely because the questions were designed to target more severe alcohol problems than those found in the general population. Connor et al. (2007) used the bMAST in an adult (aged 18 and over) alcohol-treatment setting in Brisbane, Australia. In their sample with 6,358 participants (males = 73.6%) they found that the bMAST was significantly correlated with features of dependence severity. The authors cautioned that isolated incidents of problem drinking may inflate the scores on the bMAST should it be used with the cut-off scores.

CAGE scale.

The CAGE scale was first presented at an Australian conference by Ewing and Rouse (1970) and was subsequently published by Ewing (1984). It is a screening measure that includes an item on drinking behavior, on cognitions about drinking and other people's reactions. The scale contains four items (See Appendix B) and is a self-reported measure with scores ranging from 0 to 4. A higher score indicates a greater risk for

lifetime alcoholism. It contains questions about the behavioral effects of the use of alcohol such as: “Have people annoyed you by criticizing your drinking?”; “Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover (eye-opener)?”

The CAGE has been shown to be an effective tool to identify alcohol dependence in an inpatient setting (Soderstorm et al., 1997; Hearne et al., 2002; Malet, Schwan, Boussiron, Aublet-Cuvelier, & Llorca, 2004). Researchers have shown that it is a useful tool that can be used in combination with other tests and interviews (that target current use) to detect heavy drinking in a general population (Chan, Pristach, & Welte, 1994a). Smart, Adlaf, and Knoke (1991) used the CAGE in a survey “as a means of measuring a dimension of alcohol problems among the general population” (p. 593), instead of as a clinical screening tool. In their general population study with 1,092 adults (aged 18 and over), they found that their CAGE cut-off of two or more positive responses identified people who drank approximately four drinks per day. In this study, a cut-off point will not be used, but it will be assumed that a higher score may have a higher potential for alcohol problems.

Heavy drink.

A heavy drink variable was created that is composed of the number of days per month spent drinking eight or more drinks (wine and/or beer and/or liquor) at one sitting. This variable was intended to capture the participants who were at the extreme end on the continuum of alcohol use (refer back to Figure 1). This variable is consistent with current North American literature that indicates that heavy episodic drinkers (as defined by drinking more than five drinks at a sitting) consumed an average of eight drinks during

their most recent drinking session in the United States (Naimi, Nelson, & Brewer, 2010). Research by Knupfer (1989) has shown that consuming eight drinks or more on occasion is associated with a greater number of personal and social concerns related to alcohol, compared to a group of individuals who consumed five or more drinks on occasion.

Alcohol-related harm scale (Harm total variable).

Participants were asked questions regarding alcohol-related harm. At T1, participants were asked "Was there *ever* a time in that you felt your alcohol use had a harmful effect on your (1) friendships or social life (2) physical health (3) outlook on life (happiness) (4) home life or marriage (5) work studies or employment (6) financial opportunities." The responses were coded as yes or no. The six questions were the same for the youth at T2, however the question was worded slightly differently with respect to a more specific timeframe: "In the past *seven years,* was there a time that you felt your alcohol use had a harmful effect…"

These alcohol-related harm questions were common to most large surveys with respect to alcohol use in the 1990s and this was adapted for the purposes of this survey (Rehm, Frick, & Bondy, 1999). The five aspects (social life, physical health, home life or marriage, work and/or school, and financial opportunities) that these questions address were derived from a larger survey by Hilton in 1989 (as cited in Rehm, Frick, & Bondy, 1999). A question about outlook on life (happiness) was included in the alcohol-related harm scale as well.

Data analysis

Statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS), version 19.0. SPSS was used to generate descriptive statistics for all of

the predictive variables. Bivariate correlations were performed between and within socio-demographic factors, the motives for drinking, alcohol use scales, and alcohol-related harm variables to determine which relationships were significant.

Variables with significant correlations between domains were entered into a structural model. Structural equation modeling (SEM) was used to analyze the specific mediated pathways at each time point. The goal of structural equation modeling is to "provide a parsimonious summary of the interrelationships among variables" (Weston & Gore, 2006, p. 720). SEM does not allow the researcher to make causal interpretations with their data, but allows the user to test multivariate models and hypothesized relationships between variables. The construction of a sound structural equation model involves the interpretation of many test statistics, some of which face some criticism. The criteria used to assess the models presented in this study are detailed below.

The structural equation modeling was conducted using EQS Structural Equation Modeling software, version 6.1 (Bentler, 2006a). According to Newman, Vance, and Moneyham (2010) three essential steps are needed to build a structural equation model: "(1) building the baseline/measurement model; (2) specifying the full causal model; and (3) then trimming the model" (p. 280). A measurement model was created between the alcohol indicators at each time point and the latent variables to specify the relationship between the latent variables and the alcohol consumption and alcohol-related harm scales. Subsequently, when constructing each structural equation model, all of the identified sociodemographic variables and motives for drinking variables were included.

In order to improve the fit of the model, pathways were added between variables according to the LaGrange Multiplier (*LM*) test. The *LM* test allows the researcher to

view the effect of adding parameters to a model in order to relax the restrictions (Bentler, 2006b). Next, if the variables were not indirectly or directly predicting any other variable within the model, they were dropped according to the Wald (*W*) test, which adds restrictions to the model, by suggesting which variables should be removed (Bentler, 2006b). It is important to note that the parameters within the models were added before they were removed near the final stages of the model, as Bentler (2006b) writes that is wise to overfit the model, before beginning to trim it down.

Specific criteria for each model were used to assess and decide whether or not the model fit the data and to improve the fit of the model. These criteria included reaching a chi-squared (χ^2) to degrees of freedom ratio of less than two to one, a comparative fit index (CFI) over .94, and a root mean square error (RMSEA) of less than or equal to .06 which is more stringent criteria than most researchers (e.g., Hu & Bentler, 1999; Weston & Gore, 2006) recommend, as most suggest a CFI over .90.

Chapter IV: Results

Descriptive statistics

Sociodemographic variables including age, gender, adoption status, family net worth, parent years of education, and number of household moves in the past year were examined in relation to the alcohol motives, consumption variables, and alcohol-related consequences variables. Each sociodemographic variable is described in the following section.

Sample.

Initially, 601 youth participated at T1 and 405 of the original youth sample participated at T2. In this study, data from 405 youth who completed both T1 and T2 questionnaires were used. In terms of ethnicity, 74.7% of the sample described themselves as Anglo-Canadian or American, 5% of the sample described themselves as Asian, 4.7% were British/Scottish, and the rest (15.6%) described themselves as belonging to other ethnic groups (First Nations, Italian, French-Canadian, South-Asian, South-American, or other).

Age.

Participants were asked their age at the time of the interview. At T1, collected in 1995 and 1996, the mean age of the respondents was 17.9 years at the time of the interview. There was a significant age difference between the biological and adopted youth tested by a one-way analysis of variance (ANOVA), as the mean age of the biological youth was 17.7 years and the mean age for the adopted youth was 18.6 years ($F = 7.65$, $p = 0.006$). At T2, collected in 2003 and 2004, the mean age was 25.8 years.

Gender.

Gender was coded as 0 = male and 1 = female. There were 190 males (46.9%) and 215 females (53.1%).

Biological or adopted child.

Adoption status was coded as 0 = biological and 1 = adopted. In this sample, there were 328 biological youth and 77 adopted youth who participated.

Self-reported family net worth (as reported by both father and mother).

Both parents were asked to report their family income in the past year at T1. Responses were categorized by "less than $10,000," "between $10-19,999," "between $20-29,999," "between $30-39,999,"…to "over $80,000." In this sample, 73.6% of fathers (*n* = 298) reported that their family income was $50,000 or higher (71.8% of mothers reported the same, *n* = 291).

Parent years of education (as reported by both father and mother).

Parents were asked their level of education during their T1 interview. They were asked to select one category from the following categories: "some grade school," "completed grade school," "some high school," "completed high school," "some college/technical diploma," "university graduate," "some post graduate work," or "master's degree or doctorate." In terms of highest education completed, 69.6% (*n* = 282) of mothers reported that they had completed some college or a technical diploma or higher (up to a master's degree or a doctorate degree). Similarly, there were 67.2% (*n* = 272) of fathers who reported completing some college or a technical diploma or higher.

Household moves.

Mothers and fathers were asked to report how many times they had moved in the past year at T1. This was used as a measure of social instability (Barnes et al., 2009). In this sample, only 18 fathers reported household moves within the past year (4.4%). There were 16 mothers who reported household moves (4.0%). Due to the infrequent endorsement of this variable, it was recoded as a dichotomous variable with 0 = no moves and 1 = one or more moves.

Alcohol measures

T1 Consumption patterns.

Respondents were asked whether or not they had consumed alcohol in their lifetime. In total, 86.4% (*n* = 350) responded that they had tried alcohol before. Fifty-five youth responded no. If they responded no, individuals skipped the entire alcohol section of the survey. Participants that responded yes to the initial question (*n* = 350) were asked if they had consumed alcohol within the past 12 months and 92% of those youth (*n* = 322) confirmed that their consumption was within the past year. If the participants responded that they had not consumed alcohol within the previous 12 months, they were instructed to skip to the MAST, CAGE and harm total scale. Therefore, they did not fill out the average daily alcohol consumption scale or heavy drinking question. The following frequencies examine the current drinkers only.

With regard to the drinking variables, a total of 158 out of the current drinkers (*n* = 322, 49.0%) answered that they had consumed eight or more drinks (beer, wine, liquor, or other) on at least one occasion within the past year. For the heavy drinking variable,

answers ranged from zero to 34 occasions in the past year. The mean number of heavy drinking occasions was 1.5 times during the last 12 months.

The CAGE scores can range from 0 to 4. There were 37% (*n* = 119) of current drinkers (*n* = 322) who endorsed one or more of the CAGE questions. There were 37 youth who endorsed two CAGE questions, and there were 18 participants who indicated that there were three or four CAGE questions that were applicable to them.

The MAST scores range from 0 to 29. The highest score on the MAST in this sample was 20 (*n* = 2). For current drinkers (*n* = 322), there were 109 youth who scored a 2 or more on the MAST scale. For the current drinkers with a score above zero on the MAST, 4 was the most frequent score (*n* = 54, 21.4%).

For the harm total variable, the possible scores range from 0 to 6. There were 48 participants who endorsed one of the questions (14.9%). And there were 23 youth out of the 322 current drinkers (7.1%) who endorsed two questions on the harm scale. There were 15 remaining youth who endorsed three or more of the harm questions.

T1 Drinking motives.

The drinking motive questions only include respondents who have tried alcohol in the past 12 months (current drinkers). Drink to be sociable was the most frequent motive that was endorsed, with 76.1% of youth participants who had consumed alcohol in the past 12 months responding yes. Drink to feel good was the second most endorsed motive, with 59.9% of participants endorsing that item. Drinking to relax (43.2%) and drink to feel less shy (41%) were next. Lastly, only 36% of youth endorsed drinking to add enjoyment to meals and 32% endorsed drinking to forget worries.

T2 Consumption patterns.

At T2, individuals were asked if they had ever taken a drink of beer, wine, liquor, or other alcoholic beverage, and only 13 people responded that they had never tried alcohol before. If they responded no, individuals skipped the entire alcohol section. There were 391 participants who responded that they had taken a drink of beer, wine, liquor, or another alcoholic beverage within their lifetime. Participants were asked if they had taken an alcoholic drink in the past 12 months and there were 378 individuals who were classified as current drinkers.

There were 188 current drinkers (49.7%) who endorsed one or more occasions of consuming eight or more drinks in the past year on the heavy drinking variable. Responses ranged from zero to 30 occasions. With regard to the CAGE scores, there were 122 respondents (32.3%) out of the current drinkers who endorsed one or more questions. There were 20.3% (n = 77) of participants who endorsed two or more questions on the CAGE scale.

On the MAST scale, answers can range from zero to 29. The most common frequency was a score of 4 (n = 48) with 12.7% of the current drinkers obtaining that score. Finally, for the harm total variable, the majority of current drinkers (n = 278, 73.5%) did not endorse any harm. There were 44 participants (11.6%) who endorsed one of the harm questions, and 13.8% of current drinkers (n = 52) endorsed two or more of the harm questions.

T2 Drinking motives.

Similar to T1, the most popular endorsed motive was drink to be sociable (83.1%). Interestingly, drink to add enjoyment to meals, which was endorsed only 36% at

T1, was the second most frequent motive endorsed at T2 (64%). Drink to relax (56.3%) and drink to feel good (51.3%) were the next most frequent motives. Drink to feel less shy was endorsed by 36.8% of current drinkers. And drink to forget worries was endorsed by 24.9% of drinkers.

Correlations

In order to examine the relationships between the variables for the youth at T1 and youth at T2, Pearson correlational analyses were conducted between:

1. sociodemographic variables and motives for drinking;
2. sociodemographic indicators and drinking behavior/consumption;
3. sociodemographic indicators and alcohol-related consequences;
4. motives for drinking and drinking behavior/consumption;
5. motives for drinking and alcohol-related consequences; and
6. drinking behavior/consumption and alcohol-related consequences.

T1 Correlational relationships.

In the bivariate correlational analyses between sociodemographics and motives (as presented in Table 2), age was significantly correlated with three of the motives (drink to be sociable ($r = .20$, $p < .01$); drink to add to the enjoyment of meals ($r = .12$, $p < .05$); and drink to feel less shy and inhibited ($r = .14$, $p < .05$). Gender was not significantly related to any of the motives. Adoption status was negatively correlated with drink to add to the enjoyment of meals, with biological children endorsing that specific motive more often than adopted youth ($r = -.11$, $p < .05$). Family net worth was not significantly correlated with any of the youth motives for drinking at T1. Father's education was significantly correlated with youth responses of "drink to be sociable" ($r =$

.14, $p < .01$). Mother's education was not significantly correlated for any of the youth motives for drinking at T1. There were no significant relationships between the household moves reported by mothers and fathers and the motives for drinking.

Table 2. *Sociodemographic variables and youth motives for drinking at T1*

Sociodemographic variables	Youth motives for drinking					
	Drink to be sociable	Drink to add to the enjoyment of meals	Drink to feel good	Drink to help you relax	Drink to forget worries	Drink to feel less shy and inhibited
Age	.20**	.12*	-.04	.06	-.02	.14*
Gender	.05	-.08	-.07	-.07	.02	-.04
Adoption status	-.07	-.11*	-.02	.09	.06	.08
Household moves (father)	-.07	.07	.11	-.06	.05	.05
Household moves (mother)	-.08	.08	.10	-.06	.03	.02
Family net worth (father)	.00	-.09	-.04	-.04	-.02	-.09
Family net worth (mother)	.02	.01	-.01	-.01	.02	-.01
Father's education	.13*	.10	-.04	-.03	-.03	-.04
Mother's education	-.10	.07	.03	.00	-.04	-.05

Note: *$p < .05$; **$p < .01$
Note 2: minimum $N = 300$ (Family net worth reported by mother and Drink to help you relax)

Table 3 displays the relationships between youth sociodemographics and their drinking behaviors at T1. Older youth were significantly more likely to endorse the heavy drink variable, which may be because the youngest participants ($n = 70$) were only 14 or 15 years of age at the time of the survey. Gender was negatively associated with the

average daily alcohol consumption and heavy drink variables, which means that males were significantly more likely than females to report more drinking behaviors (as males were coded as 0 and females were coded as 1). The other sociodemographic variables were not related to the youth drinking behaviors at T1.

Table 3. *Sociodemographic variables and youth drinking behavior at T1*

Sociodemographic variables	Youth drinking behavior	
	Average daily alcohol consumption	Heavy drink (8 or more)
Age	.10	.11*
Gender	-.11*	-.16**
Adoption status	.11*	.11*
Household moves (father)	.03	.01
Household moves (mother)	.03	.00
Family net worth (father)	.03	.02
Family net worth (mother)	.05	.05
Father's education	.03	.03
Mother's education	.05	-.01

Note: *$p < .05$; **$p < .01$
Note 2: minimum $N = 305$ (Family net worth reported by mother and Average daily alcohol consumption)

The relationships between sociodemographic variables and alcohol-related consequences were examined (as seen in Table 4). Age was negatively correlated with the MAST ($r = -.13$, $p < .05$), while older youth scored higher on the harm total variable ($r = .11$, $p < .05$). The relationship between adoption status and the MAST ($r = .13$, $p < .05$) and the harm total variable ($r = .14$, $p < .01$) suggests that adopted youth were more likely to experience harmful consequences relating to alcohol consumption.

Table 4. *Sociodemographic variables and alcohol-related consequences for youth at T1*

Sociodemographic variables	Alcohol-related consequences		
	CAGE	MAST	Harm total
Age	.08	-.13*	.11*
Gender	-.07	-.11	-.06
Adoption status	-.01	.13*	.14**
Household moves (father)	-.06	.02	.02
Household moves (mother)	.00	-.01	.02
Family net worth (father)	.00	.10	.02
Family net worth (mother)	.04	.11*	.04
Father's education	.02	-.01	-.03
Mother's education	.02	.03	.01

Note: *$p < .05$; **$p < .01$
Note 2: minimum $N = 326$ (Family net worth reported by mother and CAGE; Family net worth reported by mother and Harm total)

In Table 5, the correlational relationships between motives for drinking and youth drinking behaviors are presented. The analysis shows that drinking to feel good, drinking to help you relax, and drinking to forget worries are all significantly related to the heavy drink variable of consuming eight or more drinks on one occasion. Drinking to feel good was significantly related to the average daily alcohol consumption variable ($r = .14$, $p < .01$). And drink to help you relax was related to average daily alcohol consumption ($r = .13$, $p < .05$).

Table 5. *Motives for drinking at T1 and youth drinking behavior at T1*

Motives for drinking	Drinking behavior	
	Average daily alcohol consumption	Heavy drink (8 or more)
Drink to be sociable	-.06	.02
Drink to add to the enjoyment of meals	-.06	-.01
Drink to feel good	.14*	.18**
Drink to help you relax	.13*	.18**
Drink to forget worries	.10	.17**
Drink to feel less shy and inhibited	.05	.10

Note: *$p < .05$; **$p < .01$
Note 2: minimum $N = 312$ (Drink to help you relax and Average daily alcohol consumption)

As shown in Table 6, drink to be sociable was negatively associated with the MAST variable ($r = -.14$, $p < .01$). There were significant relationships between all of the other motives (besides drink to be sociable and drink to add to the enjoyment of meals), the CAGE scores, and the harm total scores. Drink to help you relax was associated with the MAST scores ($r = .17$, $p < .01$), and drink to forget worries ($r = .20$, $p < .01$) was also associated with MAST scores.

Table 6. *Motives for drinking at T1 and alcohol-related consequences for youth at T1*

Motives for drinking	Alcohol-related consequences		
	CAGE	MAST	Harm total
Drink to be sociable	.03	-.14*	-.10
Drink to add to the enjoyment of meals	-.07	-.11	-.10
Drink to feel good	.25**	.06	.19**
Drink to help you relax	.18**	.17**	.25**
Drink to forget worries	.28**	.20**	.27**
Drink to feel less shy and inhibited	.19**	.01	.16**

Note: *$p < .05$; **$p < .01$
Note 2: minimum $N = 312$ (Drink to help you relax and CAGE; Drink to help you relax and MAST)

The youth drinking behavior variables and the alcohol-related consequences for youth at T1 were all highly correlated (as shown in Table 7).

Table 7. *Youth drinking behavior and alcohol-related consequences for youth at T1*.

Drinking behavior	Alcohol-related consequences		
	CAGE	MAST	Harm total
Average daily alcohol consumption	.30**	.29**	.51**
Heavy drink (8 or more)	.28**	.35**	.40**

Note: *$p < .05$; **$p < .01$
Note 2: minimum $N = 316$ (Average daily alcohol consumption and CAGE; Average daily alcohol consumption and MAST)

T2 Correlational relationships.

The same correlations as the T1 sample were examined with the T2 sample. In Table 8, it is shown that males were more likely to endorse drinking to feel good than females ($r = -.11$, $p < .05$). Males also were more likely to respond positively that they drink to forget worries ($r = -.13$, $p < .05$). Household moves and family net worth were not related to any of the motives for drinking. Father's education was significantly related to drink to add to the enjoyment of meals ($r = .14$, $p < .01$).

Table 8. *Sociodemographic variables and motives for drinking at T2.*

Sociodemographic variables	Motives for drinking					
	Drink to be sociable	Drink to add to the enjoyment of meals	Drink to feel good	Drink to help you relax	Drink to forget worries	Drink to feel less shy and inhibited
Age	.06	.02	.02	.05	-.05	-.06
Gender	.06	.06	-.11*	-.06	-.13*	-.06
Adoption status	.02	-.01	.05	.06	.07	.03
Household moves (father at T1)	-.04	-.06	-.02	-.01	.08	.02
Household moves (mother at T1)	.02	.01	.00	.00	.07	.01
Family net worth (father at T1)	.05	.06	-.03	-.03	-.01	.00
Family net worth (mother at T1)	.04	.10	-.02	-.01	-.01	.00
Father's education (father at T1)	.03	.14**	-.03	.03	-.03	-.01
Mother's education (mother at T1)	.00	.10	.04	-.01	.02	-.02

Note: *$p < .05$; **$p < .01$
Note 2: minimum $N = 348$ (Family net worth reported by mother at T1 and Drink to forget worries)

At Time Two, age was negatively correlated with the average daily alcohol consumption variable ($r = -.11$, $p < .05$), as shown on Table 9. Gender was negatively correlated with both drinking behavior variables (average daily alcohol consumption and heavy drink), meaning that there was a stronger relationship with the male gender. Adoption status and the drinking behavior variables indicated that adopted youth were more likely to report higher average daily alcohol consumption scores and higher heavy drink scores. Household moves reported at T1 by both the mother and father was

significantly associated with average daily alcohol consumption at T2 (r = .14, r = .18, p < .01), but not the heavy drink variable at T2.

Table 9. *Sociodemographic variables at T2 and drinking behavior at T2.*

Sociodemographic variables	Drinking behavior	
	Average daily alcohol consumption	Heavy drink (8 or more)
Age	-.11*	-.10
Gender	-.14**	-.23**
Adoption status	.14**	.11*
Household moves (father at T1)	.18**	.06
Household moves (mother at T1)	.20**	.07
Family net worth (father at T1)	.12*	.02
Family net worth (mother at T1)	.10	-.02
Father's education (father at T1)	.01	-.06
Mother's education (mother at T1)	.04	.03

Note: *p < .05; **p < .01
Note 2: minimum N = 354 (Family net worth reported by mother at T1 and Average daily alcohol consumption)

As depicted on Table 10, there was a significant negative correlation between gender and both the CAGE (r = -.17, p < .01) and the Harm total scale (r = -.18, p < .01), indicating a stronger relationship to the male gender. Adoption status was significantly correlated with the MAST (r = .16, p < .01). Household moves (as reported by the mother at T1) was correlated with the CAGE scores at T2 (r = .11, p < .05).

Table 10. *Sociodemographic variables and alcohol-related consequences at T2.*

Sociodemographic variables	Alcohol-related consequences		
	CAGE	MAST	Harm total
Age	-.05	.00	-.08
Gender	-.17**	-.09	-.18**
Adoption status	.06	.16**	.10
Household moves (father at T1)	.08	.05	.02
Household moves (mother at T1)	.11*	.02	.05
Family net worth (father at T1)	.00	-.03	-.01
Family net worth (mother at T1)	.05	-.01	.03
Father's education (father at T1)	-.03	-.03	-.02
Mother's education (mother at T1)	-.02	.02	.03

Note: *$p < .05$; **$p < .01$
Note 2: minimum $N = 364$ (Family net worth reported by mother at T1 and Harm total)

As seen in Table 11, the motives for drinking at T2 that were positively correlated with the average daily alcohol consumption variable at T2 included: drink to feel good ($r = .16$, $p < .01$), drink to help you relax ($r = .14$, $p < .01$), drink to forget worries ($r = .23$, $p < .01$) and drink to feel less shy and inhibited ($r = .16$, $p < .01$). The same variables were significantly correlated with the heavy drink variable. Interestingly, the drink to add to the enjoyment of meals was negatively correlated with the heavy drink variable ($r = -.16$, $p < .01$).

Table 11. *Motives for drinking and youth drinking behavior at T2.*

Motives for drinking	Drinking behavior	
	Average daily alcohol consumption	Heavy drink (8 or more)
Drink to be sociable	-.02	.04
Drink to add to the enjoyment of meals	.03	-.16**
Drink to feel good	.16**	.15**
Drink to help you relax	.14**	.13*
Drink to forget worries	.23**	.22**
Drink to feel less shy and inhibited	.16**	.16**

Note: *$p < .05$; **$p < .01$
Note 2: minimum $N = 365$ (Drink to forget worries and Average daily alcohol consumption)

In Table 12, correlations are shown between motives for drinking at T2 and the alcohol-related consequences at T2. The CAGE was significantly associated with all of the motives except drinking to be sociable and drinking to add to the enjoyment of meals. The MAST was negatively associated with drink to add to the enjoyment of meals ($r = -.14$, $p < .01$), however there was a significant positive relationship between the MAST and drinking to forget worries ($r = .21$, $p < .01$).

Table 12. *Motives for drinking and alcohol-related consequences at T2.*

Motives for drinking	Alcohol-related consequences		
	CAGE	MAST	Harm total
Drink to be sociable	.06	.01	.03
Drink to add to the enjoyment of meals	-.03	-.14**	-.02
Drink to feel good	.25**	.06	.21**
Drink to help you relax	.28**	.13*	.18**
Drink to forget worries	.34**	.21**	.31**
Drink to feel less shy and inhibited	.16**	.10	.15**

Note: *$p < .05$; **$p < .01$
Note 2: minimum $N = 366$ (Drink to forget worries and Harm total)

Table 13 shows that all of the drinking behavior variables at T2 are highly correlated with alcohol-related consequences. These results are similar to the highly correlated T1 relationships between drinking behaviors and alcohol-related consequences. Although all of the correlations are significant, it is interesting to note that the correlations between the drinking behavior variables and the harm total scale are much lower at T2 compared to T1. This may suggest that the individuals in this sample have learned how to drink and stay out of trouble as they got older. This may be because the legal drinking age in British Columbia is 19, which means that drinking may be more socially accepted once people reach that age.

Table 13. *Drinking behavior and alcohol-related consequences at T2.*

Drinking behavior	Alcohol-related consequences		
	CAGE	MAST	Harm total
Average daily alcohol consumption	.36**	.25**	.28**
Heavy drink (8 or more)	.33**	.17**	.23**

Note: *$p < .05$; **$p < .01$
Note 2: minimum $N = 373$ (Average daily alcohol consumption and Harm total)

T1 and T2 Correlational relationships.

Phi coefficients, which are a measure of the association between two dichotomous variables, were conducted between the youth motives for drinking at T1 and T2 (see Table 14). All of the specific motives at T1 were significantly related with the same motives at T2. For example, drink to feel good at T1 was significantly related with the drink to feel good variable at T2 ($r = .21$, $p < .01$).

Table 14. *Youth motives for drinking at T1 and T2.*

T1 Motives for drinking	T2 Motives for drinking					
	Drink to be sociable	Drink to add to the enjoy-ment of meals	Drink to feel good	Drink to help you relax	Drink to forget worries	Drink to feel less shy and inhibited
Drink to be sociable	.16**	.03	-.02	.11	-.11	.04
Drink to add to the enjoyment of meals	.08	.27**	-.01	.11	-.03	-.09
Drink to feel good	.03	-.03	.21**	.20**	.20**	.20**
Drink to help you relax	-.03	-.04	.21**	.24**	.22**	.20**
Drink to forget worries	-.03	-.08	.15*	.17**	.28**	.18**
Drink to feel less shy and inhibited	.05	.02	.08	.16**	.16**	.28**

Note: *$p < .05$; **$p < .01$
Note 2: minimum $N = 299$ (Drink to help you relax T1 and Drink to forget worries T2)

Table 15 shows the youth motives for drinking at T1 and the subsequent drinking behavior variables at T2. There were significant positive correlations between drinking to feel good at T1 and the average daily alcohol consumption variable at T2 ($r = .16$, $p <$

.01), and the drink to relax variable (r = .14, p < .05), drink to forget worries (r = .15, p < .05) and drink to feel less shy (r = .12, p < .05). Drinking to feel good was significantly associated with the heavy drink variable at T2 (r = .13, p < .05). Additionally, drinking to feel less shy was associated with the T2 heavy drinking variable (r = .12, p < .05). Drink to be sociable at T1 was negatively related to the heavy drinking variable at T2 (r = -.15, p < .01).

Table 15. *Youth motives for drinking at T1 and drinking behavior at T2.*

T1 Motives for drinking	T2 Drinking behavior	
	Average daily alcohol consumption	Heavy drink (8 or more)
Drink to be sociable	-.03	-.15**
Drink to add to the enjoyment of meals	.01	-.13*
Drink to feel good	.16**	.13*
Drink to help you relax	.14*	.06
Drink to forget worries	.15*	.07
Drink to feel less shy and inhibited	.12*	.12*

Note: *p < .05; **p < .01
Note 2: minimum N = 304 (Drink to help you relax T1 and T2 Average daily alcohol consumption; Drink to feel less shy and inhibited T1 and T2 Average daily alcohol consumption)

Drink to feel good at T1 was associated with the CAGE and the Harm total scores at T2 (r = .22, r = .16, p < .01) (Table 16). At T1, drinking to help you relax and drinking to forget worries was associated with all three alcohol-related consequences scales at T2. Drink to feel less shy and inhibited was positively correlated with the CAGE (r = .14, p < .05) and the Harm total score (r = .18, p < .01).

Table 16. *Youth motives for drinking at T1 and alcohol-related consequences for youth at T2.*

T1 Motives for drinking	T2 Alcohol-related consequences		
	CAGE	MAST	Harm total
Drink to be sociable	-.02	-.06	-.04
Drink to add to the enjoyment of meals	-.13*	-.10	-.07
Drink to feel good	.22**	.01	.16**
Drink to help you relax	.17**	.17**	.20**
Drink to forget worries	.13*	.15**	.13*
Drink to feel less shy and inhibited	.14*	.04	.18**

Note: *$p < .05$; **$p < .01$
Note 2: minimum $N = 310$ (Drink to help you relax T1 and Harm total; Drink to feel less shy and inhibited T1 and Harm total)

All of the drinking behavior variables at T1 were correlated with the drinking behavior variables at T2 (as shown in Table 17).

Table 17. *Drinking behavior at T1 and T2.*

T1 Drinking behavior	T2 Drinking behavior	
	Average daily alcohol consumption	Heavy drink (8 or more)
Average daily alcohol consumption	.14*	.21**
Heavy drink (8 or more)	.17**	.26**

Note: *$p < .05$; **$p < .01$
Note 2: minimum $N = 309$ (Average daily alcohol consumption T1 and Average daily alcohol consumption T2)

Youth drinking behavior at T1 was highly correlated with the alcohol-related consequences at T2 (as depicted in Table 18).

Table 18. *Youth drinking behavior at T1 and alcohol-related consequences at T2.*

T1 Drinking behavior	T2 Alcohol-related consequences		
	CAGE	MAST	Harm total
Average daily alcohol consumption	.17**	.16**	.15**
Heavy drink (8 or more)	.23**	.14*	.18**

Note: *$p < .05$; **$p < .01$
Note 2: minimum $N = 316$ (Average daily alcohol consumption T1 and Harm total)

Lastly, the alcohol-related consequences variables at both time points were highly correlated (as shown in Table 19).

Table 19. *Alcohol-related consequences at T1 and T2.*

T1 Alcohol-related consequences	T2 Alcohol-related consequences		
	CAGE	MAST	Harm total
T1 CAGE	.32**	.33**	.31**
T1 MAST	.11*	.27**	.16**
T1 Harm total	.25**	.31**	.30**

Note: *$p < .05$; **$p < .01$
Note 2: minimum $N = 336$ (T1 CAGE and Harm total; T1 MAST and Harm total; T1 Harm total and Harm total)

Structural equation model results

Structural equation modeling was used to test the interrelationships between sociodemographic variables, motives for drinking, drinking behavior, and alcohol-related consequences at T1 (Figure 5) and T2 (Figure 6). Additionally, a combined model between T1 and T2 was created (Figure 7). The sociodemographic variables were entered along with the motives for drinking at the first level of the model. The measured drinking behavior variables (average daily alcohol consumption and heavy drink) were entered

onto a latent factor (consumption). The latent factors are indicated by circles on each of the models (Figures 5-7). The alcohol-related consequences variables (CAGE, MAST, and harm total), were entered onto a second latent factor (consequences).

Summary of sociodemographic variables in the structural equation models.

In the final models, all of the sociodemographic variables (age, gender, adoption status, self-reported family net worth as reported by both parents, parent years of education as reported by both parents, and household moves as reported by both parents) were initially included. However, once the models were trimmed down, gender, age, and adoption status were the only sociodemographic variables that were included. In this study, not all of the participants were included in the structural equation model, as participants without data for the included variables were removed from the model (i.e., non-drinkers). For the separate T1 and T2 models, youth adoption status was the only sociodemographic variable that was included in both models. Age and gender remained significant in the T2 model. In the combined longitudinal model, youth adoption status and gender remained, while age was removed, as it was not significantly associated with other variables and latent factors in the model (as determined by the *W* test).

T1 Model results.

The final structural equation model at T1 is shown in Figure 5. The overall goodness of fit statistics were $\chi^2 = 60.41$, $p = 0.00$, CFI = 0.96, and RMSEA = 0.06. The Satorra-Bentler scaled chi-square was 35.76 on 28 degrees of freedom. The adjusted robust method goodness of fit CFI was the same, however the RMSEA improved to 0.03. Results showed that at Time 1 adoption status was the only sociodemographic predictor of T1 consumption (.14) and T1 consequences (.15). Adopted youth were more likely to

report higher scores on the latent alcohol consumption and consequence factors. Drink to be sociable had a negative relationship to T1 consequences (-.13) while drink to help you relax had a positive relationship (.15). Drink to feel good was positively related to T1 consumption (.14), and it had a direct relationship to the CAGE (.15). The drink to forget worries variable was directly related to the heavy consumption variable (.08) and it had a positive relationship to T1 consequences (.27)

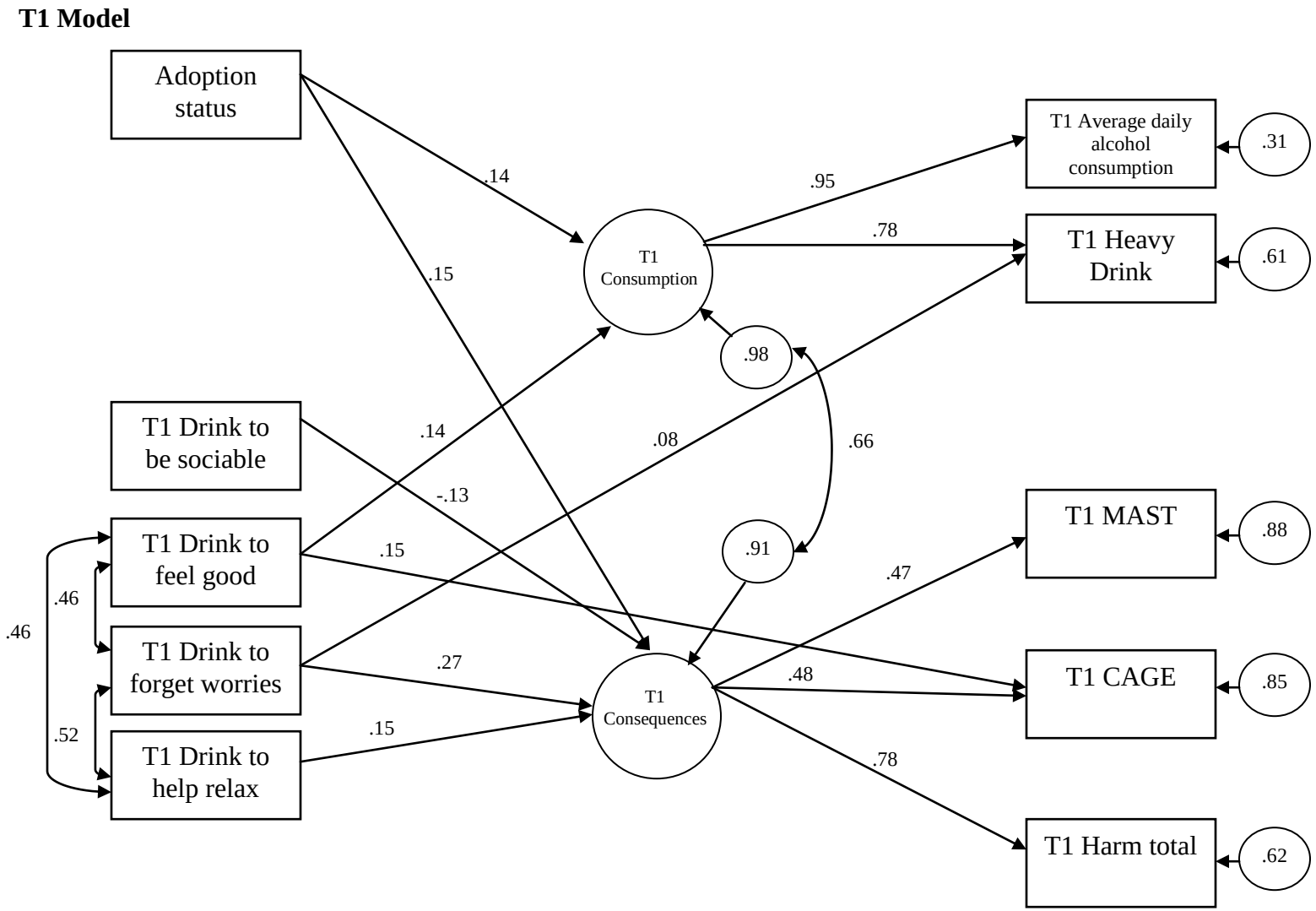

Figure 5. Structural equation model for youth at T1.

T2 Model results.

Figure 6 shows the structural equation model for the Time 2 data. The overall goodness of fit statistics for the T2 model were $\chi^2 = 83.68$, $p = 0.00$, CFI = 0.96, and RMSEA = 0.04. The Satorra-Bentler scaled chi-square was 77.87 on 49 degrees of freedom. The adjusted robust method CFI was 0.94 and the RMSEA remained at 0.04.

In this model, age, gender, and adoption status remained as significant sociodemographic predictors. Age was negatively related to T2 consumption (-.18), meaning that the younger participants had higher scores on the latent factor. There was a negative relationship between gender and the consumption latent factor, indicating that males had higher scores on alcohol consumption. Further, adoption status was related to the alcohol consumption latent factor, which indicated that adopted youth had higher scores on T2 consumption (.22) which was consistent with the Time 1 model.

With regard to the motives for drinking, drink to feel good predicted T2 consumption (.13) but not T2 consequences, indicating that endorsing that specific motive may predict higher consumption but not consequences related to drinking. On the other hand, participants who indicated that they drink to help relax had higher scores on T2 consequences (.12). At T2, participants who endorsed that they drink to add to the enjoyment of meals had lower scores on the heavy drinking variable (-.15). Interestingly, this variable did not emerge as important for the respondents at T1 (while they were at a younger age). However, as the participants became older, this motive was directly linked to lower levels of heavy consumption. Lastly, drinking to forget worries was positively associated to both T2 consumption (.23) and T2 consequences (.18).

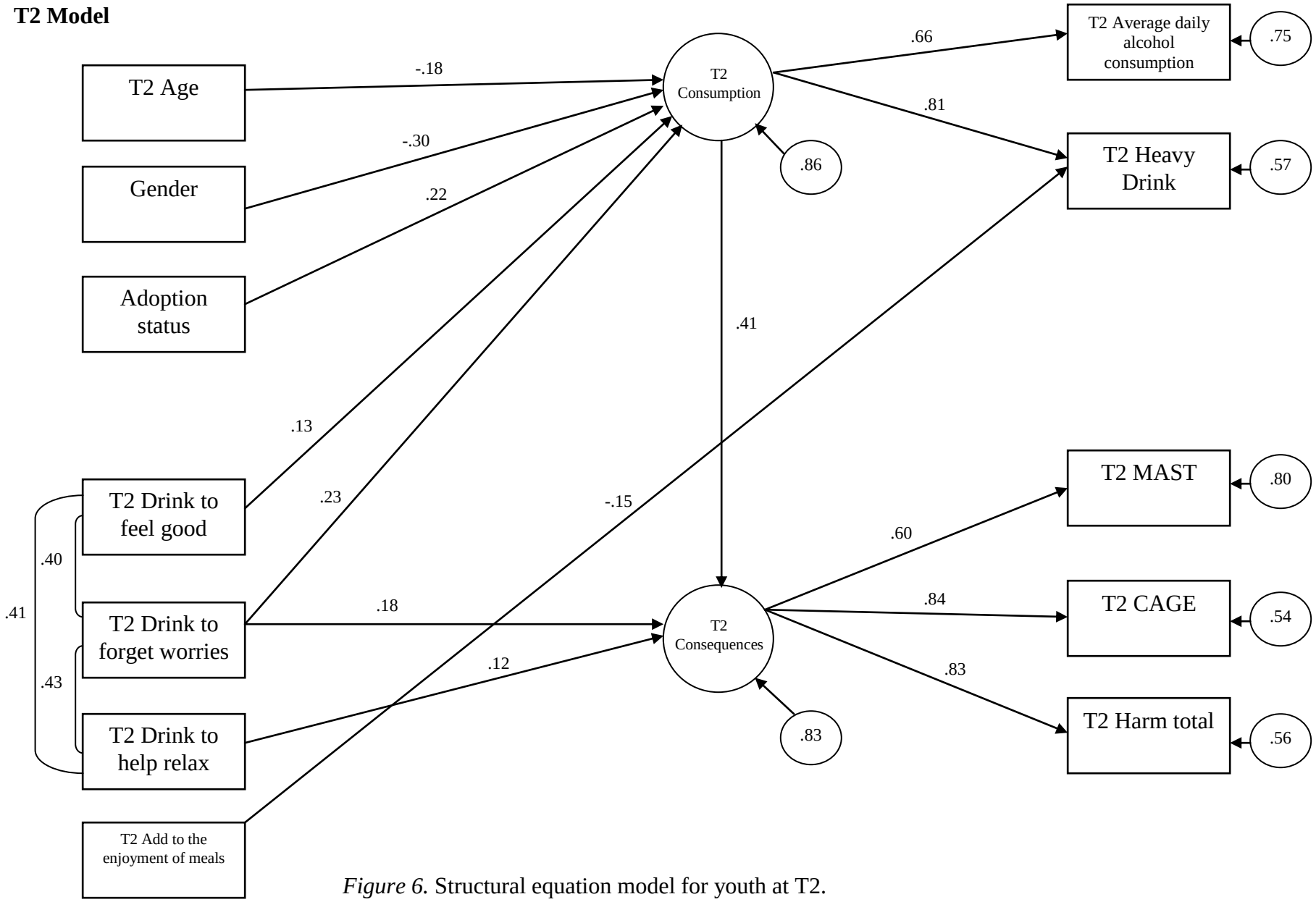

Figure 6. Structural equation model for youth at T2.

Combined T1 and T2 Model results.

For the combined model, the overall goodness of fit statistics were $\chi^2 = 169.57$, p = 0.00, CFI = 0.94, and RMSEA = 0.05. The Satorra-Bentler scaled chi-square was 124.61 on 95 degrees of freedom. The adjusted robust method CFI was 0.94 and the RMSEA lowered to 0.03.

The final combined T1 and T2 model contains gender, adoption status, motives for drinking stated at T1, and the alcohol consumption and alcohol-related consequences variables at both T1 and T2 (Figure 7). Age was dropped out of the final model. This model was created to analyze whether the motives for drinking predicted consumption over time. Adoption status was predictive of T1 consumption (.10) and the male gender was directly predictive of T2 consumption (-.31). Drink to be sociable was negatively related to T1 consequences (-.16). The drink to feel good motive was related to T1 consumption (.14) and T2 consumption (.19), indicating that this motive has a relationship with alcohol consumption at both time points but did not predict alcohol-related consequences. Drink to relax (.18) and drink to forget worries (.28) were both positively related to T1 consequences. T1 consumption significantly predicted T2 consumption (.27) and T1 consequences significantly predicted T2 consequences (.39). Additionally the T2 consumption latent factor directly predicted the T2 consequences latent factor (.35).

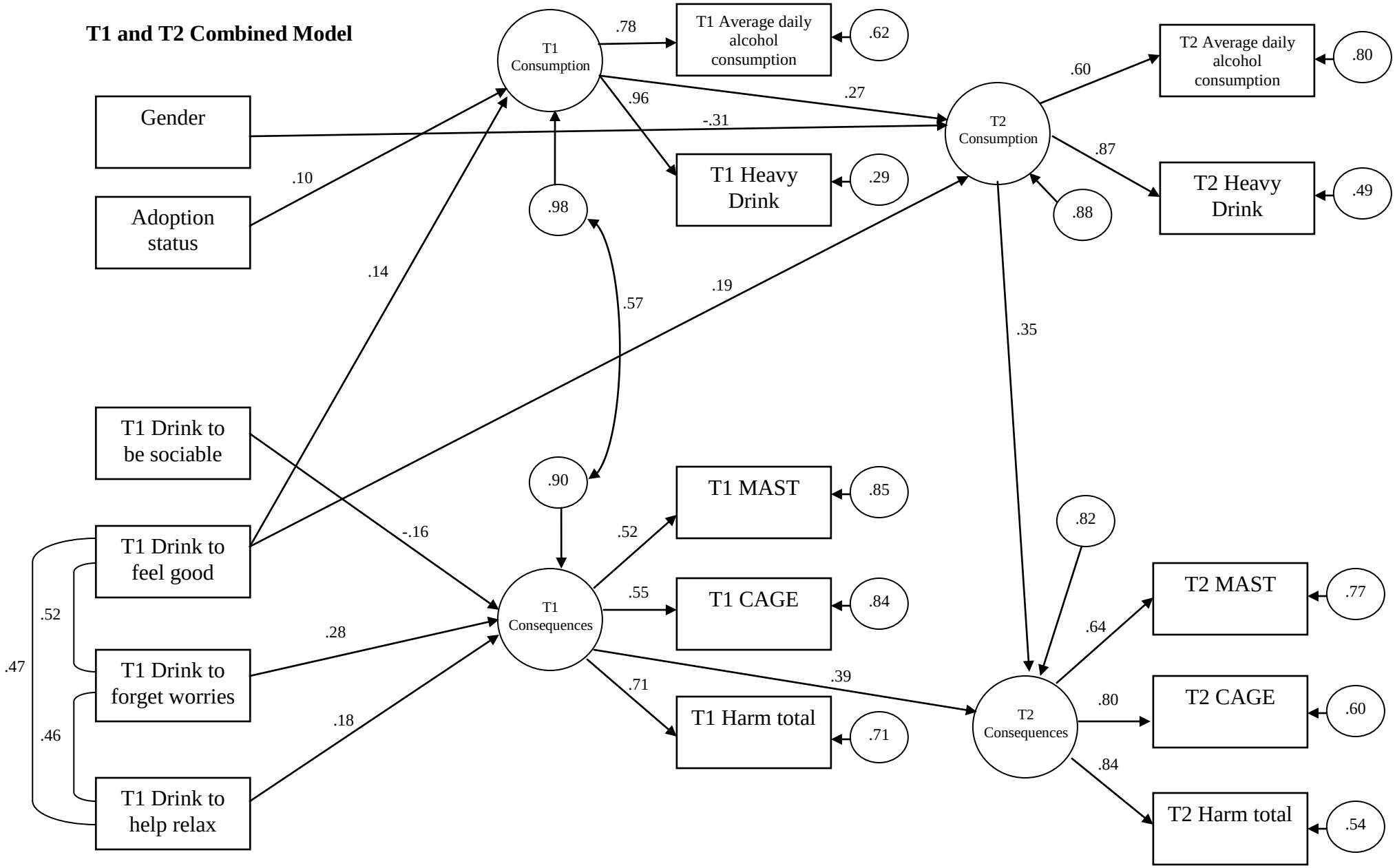

Figure 7. Combined structural equation model for the T1 and T2 sample.

Chapter V: Summary of findings

Coping motives

Drink to forget worries.

This study looked at the same group of 405 participants over time. Initial findings at T1 (collected in 1995-1996) found that the drink to forget worries motive was directly predictive of the heavy drinking variable (of eight or more drinks at one occasion). In other words, youth that endorsed that specific coping motive were more likely to report heavier consumption of alcohol. In the T2 model, no direct link was found to the heavy consumption variable but drinking to forget worries was predictive of both the consumption and consequences latent factors in the model. In the final combined model, drinking to forget worries was predictive of T1 consequences. And T1 consequences are predictive of alcohol-related consequences at T2. These findings are consistent with studies conducted by Neff (1997), Labouvie and Bates (2002), Comasco et al. (2010), and Simons, Correia, and Carey (2000).

The results from this study counter findings from McCabe's (2002) study, in which no significant relationships were found between their drink to reduce negative affect scale and heavy episodic drinking (as defined by five or more drinks per occasion for males and four or more drinks per occasion for females). Overall though, the evidence in the literature supports the link between drinking to cope and adverse long-term consequences. Drinking may be an available way of coping in the short term that achieves the goal of distracting a person from a problem, but in the long term, by turning to drinking, more problems will arise from this coping strategy.

Drink to help you relax.

At T1, the drink to help you relax motive positively predicted T1 consequences (.15). The same pattern emerged at T2 (.12), and for the combined model (.18). Thus, in all three models, drinking to help relax positively predicted the alcohol-related consequence scores, but not the consumption variables.

Drink to feel less shy and inhibited.

This motive did not emerge as significant in any of the models.

Enhancement motives

Drink to feel good.

In the T1 model, the drink to feel good variable was predictive of T1 consumption (.14). Additionally, the drink to feel good variable directly predicted the CAGE score (.15). In the T2 model, the drink to feel good variable again predicted consumption (.13). The combined model shows that drink to feel good at T1 predicted both T1 consumption (.14) and T2 consumption (.19). This means that this motive at T1 predicted the consumption measures but not the alcohol-related harm measures in the combined model.

Social motives

Drink to be sociable.

At T1, drink to be sociable was negatively related to consequences (-.13). This finding did not emerge in the T2 model. In the combined model, drink to be sociable negatively predicted T1 consequences (-.16). This motive appears to be a protective factor in alcohol-related consequences. This is consistent with other research that has shown that individuals who drink for social reasons are less likely to use alcohol excessively (Kuntsche et al., 2005). In this study, it was also the motive that was

endorsed the most often, which may mean that many of the participants who endorsed this motive also endorsed other more specific motives. The drink to be sociable variable did not significantly predict alcohol consumption or alcohol-related consequences at T2, which may reflect the older age of the sample. The results of drinking to be sociable in this study are contrary to results found by Comasco et al. (2010) who found that individuals who drank for social-enhancement motives were more likely to drink more frequently and have drinking problems. However in that study, social motives were combined with enhancement motives and, arguably, coping motives ("drink to reduce inhibitions"), and they therefore included their "drink to feel pleasure" and "drink to become drunk" questions all under the same domain, which does not match up with the domains of the current study.

Drink to add to the enjoyment of meals.

At T1, this motive was not significantly predictive of consumption. However, at T2, there was a direct negative relationship between drinking to add to the enjoyment of meals and the heavy drink variable (-.15).

Chapter VI: Discussion and Conclusion

Strengths and Limitations

The current study examined alcohol use motives, consumption, and consequences, both cross-sectionally and longitudinally through the use of structural equation modeling in a Canadian sample. The strength of the VFS dataset is that it provides data from a large community-based sample and it offers independent reports by both parents and their children regarding their sociodemographics and personal substance use habits. The VFS dataset also permitted the examination of both biological and adopted youth, their motives for drinking, and their alcohol consumption patterns. Furthermore, longitudinal data were available for the youth sample. Multiple measures were available for key alcohol use indicators, which facilitated the use of latent variable structural equation models.

It is important to note that this study also had several important limitations. The VFS relied on interviewer administered self-reports of alcohol use which may be prone to response bias, where participants may answer questions according to what they think they should answer as opposed to their true habits. Whitford, Widner, Mellick, and Elkins (2009) report that there are many issues that may affect self-report validity in alcohol studies which include duration between consumption and reporting, confidentiality, whether or not the participants know there may be methods to verify their drinking habits, and collateral reporting. While respondents in this study were assured that their confidentiality would be respected, it can be expected that some youth may not have reported the extent of their alcohol use, or they may have unintentionally underestimated their use, while some may have exaggerated their use. Also, due to the nature of alcohol,

which may affect short-term memory and memory retrieval (Brown et al., 2009), these reports may be skewed. However, despite the limitations of self-reporting alcohol use, Whitford et al. (2009) found moderate agreement between self-reports and collateral reports and other authors suggest that self-reporting is the best way to obtain information from light to moderate drinkers (Alvik, Haldorsen, & Lindemann, 2005). Research by Stockwell, Zhao, Chikritzhs, and Greenfield (2008) in Australia suggests that under-reporting may be very common in surveys because estimates from surveys of the amount of alcohol consumed in an area only accounts for at most 80.71% of the total alcohol sales in a given region at the same point in time.

One main limitation of the VFS is that the data were obtained only from intact two-parent families who had not experienced divorce, which limits the generalizability of the results to other compositions of families. Also, there were no same-sex couples included in this sample. Further, these data were collected in a large, urban environment, which may limit the generalizability of the findings to smaller communities. Additionally, the majority of the sample (79.4%) identified themselves as Caucasian or of European descent (British or Scottish), which may limit the generalizability of these results to other locations, such as First Nations communities in British Columbia. The study did not include participants at risk of heightened substance use, such as children in the care of the B.C. government or those living with other family members besides their parents. A North American study indicates that children in care have a slightly higher risk to develop alcohol use problems in the future (Pilowsky & Wu, 2006). Due to the lack of research that examines motives for drinking and adopted youth, more research is needed to replicate the present findings.

With regard to the sociodemographic indicators that were examined, this author did not choose to look at religiosity, which has been shown to be a protective factor for alcohol consumption and alcohol-related consequences for certain groups of youth (mainly heterosexual youth), but not others (specifically lesbian and bisexual women) (Rostosky, Danner, & Riggle, 2010). Research from the United States also points to differences between individually motivated religious youth versus community motivated religious youth and the differences in their consumption (Wallace, Brown, Bachman, & LaVeist, 2003). Due to the overall lack of information in the VFS in regard to how the youth identified with their potential religious beliefs and how important those beliefs were to them, no questions about religion were included in this analysis.

This study used secondary data, which limits the user from asking a question, researching specific measures to include, and following through with gathering responses. Instead, the user must understand what the data contains and ask a question that can be answered with that data. Because the information from this survey was collected several years ago, it was difficult to determine the origin of several of the measures and try to understand why some of them were shortened. In most cases, the information was found by searching each question within the measure.

The motives for drinking alcohol were assessed by single-item yes or no dichotomous questions rather than multidimensional scales. This may limit the generalizability of this study to other alcohol motive studies. For example, if an individual misunderstood the question, it may have affected the endorsement of a given motive domain. It also may have been useful to include open-ended questions about personal motives for consuming alcohol to assess if there were any other important

motives (such as conformity motives) that were not included in the study. However, this author believes that the longitudinal nature of the study permitted interesting results to be found, despite the simple loading of the questions onto the three domains. Additionally, the results in this study seem to be consistent with similar studies (albeit cross-sectional) on motives for drinking (Kuntsche et al., 2005; Simons et al., 2000). One other important limitation that Comasco et al. (2010) note in their study is that by comparing the same motives at different age groups, it does not take into account that the different motives could have different meanings based on age.

With regard to the data analysis, structural equation modeling has a number of strengths, as it allows the user to look at the relationships between many variables and analyze the covariance structures. However, it is important to be cautious when interpreting modified models and to avoid making cause-effect statements (Weston & Gore, 2006). Moreover, when adding and dropping parameters (as per the LM and Wald test), each change should be substantially justified based on the data and theory.

The alcohol-related harm scale was used to measure self-identified consequences with alcohol. Social harm from drinking is interactional, in that a reaction is required on a community level, or recognition on a personal level, that interacts with an individual's response to the harm questions (Room, 2000). For example, with the question, "was there *ever* a time that you felt your alcohol use had a harmful effect on your friendships or social life?", it may be that an individual responds "no" but does not realize the effect of their alcohol consumption on their peers. Thus, future research could include the opinions of family members and peers about the effect of one individual's drinking on their respective lives. This would support the effort to more tangibly define alcohol abuse.

There is also criticism that the social consequences of drinking will be different in every culture, as the extent of drinking varies (Room, 2000). In addition, some individuals may not relate any alcohol-related harm in their lives to the effects of alcohol, instead choosing to attribute it to some other occurrence. However, the questions that were asked in the VFS put the individuals in charge of making assessments themselves. But it does bring up the question of "who is defining the drinking as problematic?" which is a question that permeates the alcohol-related consequences and consumption literature.

It could be argued that amount and frequency of drinking could affect the endorsed motives for drinking. To date, only one study has addressed this question. Schelleman-Offermans et al. (2010) examined whether or not alcohol consumption affected subsequent drinking motives in their longitudinal model. They did not find any feedback mechanisms indicating that alcohol consumption affects drinking motives at Time 2. In order to be sure that my model occurs in the direction that I stated, I attempted to answer a follow-up question: Do drinking habits affect motives for drinking? To answer this question, I analyzed drinking at T1 to see if it could potentially predict the endorsed motives for drinking at T2. I created a logistic regression model to look at my model in the opposite direction. I found that there were no significant associations between the drinking measures and the motives for drinking, indicating that the data fits the direction of my initial model.

Implications

Overall, the results of this study show that there are multiple motives for engaging in alcohol use. This study found that coping motives (drinking to relax and forget worries) seemed to lead to higher consumption and greater consequences compared with

drinking for social motives. Enhancement motives were associated with high drinking levels but not alcohol-related consequences. These findings are important because in the absence of healthy coping strategies, youth may learn to rely on alcohol to relieve anxiety and relax. Brown et al. (2009) point out that the ability to self-regulate behavioral impulses is important during the adolescent years, as the youth become more independent from their parents and more dependent on peer groups, thus increasing their exposure to risky situations. If healthy options are available to help youth cope with the stressful events in their lives, it may be that they are less likely to follow an alcohol consumption trajectory that leads to alcohol-related harm and consequences.

In terms of treatment efforts, this research points to targeting groups of peers who are engaging in heavy episodic drinking, determining their motives for drinking, and then tailoring the programs depending on their specific motives to the individual. This may mean that an intervention with a youth who is dealing with alcohol issues needs to be client-centered and focused on the motives behind the use. In this treatment, it would be important for the practitioner to be open to eliciting information about the context and motivations for alcohol use from the youth themselves. Collaborative therapies or motivational counseling may be helpful avenues for practitioners to engage in with their youth clients to initiate conversations about motives for alcohol use.

A collaborative therapeutic stance favors local client knowledge, mutual inquiry and an open curiosity demonstrated by the therapist, where differences between people are valued. A collaborative stance is a way of relating to another person or persons through the relationship that is formed by adopting an open and curious position. In the view of the collaborative therapist, the individuals are “always engaged in conversational

becoming, constructing and reconstructing, and shifting identities through continuous interactions with others" (Anderson & Gehart, 2007, p. 17). Thus, a joining of a therapist and their clients in a focused conversation can create new meanings and new understandings. It is through the therapeutic relationship that the therapist and the client can acknowledge and explore together the meanings of the client's selves-in-context and the interaction between their social and private worlds. Questioning assumptions, clarifying responses, and engaging collaboratively in the moment with the client are all components of this therapeutic work which may be an appropriate way to engage young clients.

Some of the relevant alcohol motives research points to motivational counseling (Cox & Klinger, 2002; Kuntsche et al., 2006a). Motivational counseling involves assessing the client's behavior (in this instance, alcohol consumption), asking questions about the client's expectations of change which can initiate discussions about biological, psychological and sociocultural factors, and then working with the client to bring awareness to these factors (Cox & Klinger, 2011). Counseling may bring about a sense of control and allow the client to explore strengths in other areas of their lives that are more important to them than drinking, which in turn may allow them to access new resources (healthy incentives) that can bring about a sense of balance and fulfillment (Cox et al., 2011). This type of counseling positions the client in the expert role, wherein the counselor is viewed as an active reflector in the process. However, Resnicow and Rollnick (2011) caution that counselors need to be able to tailor their style to meet client needs, as some clients may prefer a more directive style in which the counselor is positioned as an expert on substance use.

Kuntsche et al. (2010) discuss the need for practitioners to target homogeneous groups of youth rather than creating universal substance reduction or prevention programs that treat all youth as drinking for the same motives. When a youth identifies that they are drinking to forget their worries, as practitioners we should be providing direct support for their emotional well-being to help them reduce or minimize the harms from their drinking. We should be aware that there is cause for concern, when coping motives are identified. Programs may be more effective when taking into account the separate motivations youth may have for drinking, for example, enrolling youth that are drinking for coping motives in self-esteem programs, life skills training, or helping them cope with their life stresses in other ways (Kuntsche et al., 2010).

In terms of prevention efforts, as practitioners, we can begin to teach and model healthier ways to cope with stressful events. We can also attempt to understand the needs that alcohol fulfils in an individual's life. "If a person is unable to find satisfaction from other positive incentives, he or she is more likely to turn to alcohol or other substances as a way to gain pleasure or find emotional relief" (Cox & Klinger, 2002). This positions the Child and Youth Care professional as a part of a support system within a youth's life who can potentially initiate positive interactions with the youth and the other individuals around them.

Kuntsche et al. (2006b) point out that by "identifying and collecting information on the specific needs that alcohol serves for particular individuals, preventative strategies may be more effectively designed" (p. 1854). Although drinking in social contexts to be sociable is considered normal within Canadian society, it should be noted that this could have the potential to become a harmful behavior over time (Comasco et al., 2010), even

though a significant relationship between drink to be sociable and alcohol-related consequences was not shown in this particular study. With regard to youth who are drinking to have fun or be sociable, Kuntsche et al. (2010) suggest providing other sources of stimulation or providing safer drinking environments to minimize the alcohol-related consequences of drinking. If the needs that the alcohol serves are addressed, youth may be more likely to focus on other options or reduce their drinking.

Future research on alcohol use could include conformity motives alongside the other three motive categories. Additionally, more longitudinal research on the motives would be needed to replicate the present findings. It also remains to be seen whether the motives remain consistent across adulthood. Including specific information about mental health issues and stressful life events and the drinking motives may help further the research in the field. The alcohol-related harm scale could include more specific incidents in order to be more thorough.

Martens et al. (2003) suggest that future drinking motives research needs to explore the possible treatment implications of the relationship between the motives and the harm. For example, "does reducing drinking motives correspond to reduced alcohol consumption?" (p. 828). Other research is beginning to look at stressful life events in association with coping motives to elucidate the hypothesis that early experiences with alcohol facilitate drinking to cope as a strategy to reduce negative emotions (Buchmann et al., 2010). Future research could evaluate whether delaying the onset of drinking, combined with healthy coping responses, helps create less harmful drinking patterns.

Conclusion

In the present investigation, youth cognitive motives for drinking were examined in relation to alcohol consumption and consequences in a longitudinal and cross-sectional manner. We already know that the consequences of heavy drinking in youth lead to greater injury rates (McCreary Centre Society, 2004). Therefore, it can be helpful to examine the motives behind their use of alcohol in order to determine what needs the alcohol is fulfilling for the individuals. By extricating the specific motives that may lead to more harmful use of alcohol, we can alter our prevention and treatment programs to support individuals that may be on their way to using substances more heavily. It is not only important to focus on how much alcohol is consumed, but it is also important to understand what needs alcohol fulfils for the individual.

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Appendix A

Brief Michigan Alcohol Screening Test (MAST Scale)

1	Do you feel you are a normal drinker?
2	Do friends or relatives think you are a normal drinker?
3	Have you ever attended a meeting of Alcoholics Anonymous (AA) for help with your dinking?
4	Have you ever lost friends or girl/boy friends because of your drinking?
5	Have you ever gotten into trouble at work because of your drinking?
6	Have you ever neglected your obligations, your family, or your work for two or more days in a row because you were drinking?
7	Have you ever had delirium tremens (DTs) severe shaking, heard voices, or seen things that weren't there after heavy drinking?
8	Have you ever gone to anyone for help about your drinking?
9	Have you ever been hospitalized because of your drinking?
10	Have you ever been arrested for drunk driving after drinking?

Appendix B

CAGE Scale

1	Have you ever felt that you should cut down on your drinking?
2	Have people annoyed you by criticizing your drinking?
3	Have you ever felt bad or guilty about your drinking?
4	Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover (eye-opener)?