

Content Development of the Relationships with Alcohol Scale for Late-Adolescents

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Recommended Citation

Schroedl, Rose Lucey, "Content Development of the Relationships with Alcohol Scale for Late-Adolescents" (2011). *Dissertations (2009 -)*. Paper 103.
http://epublications.marquette.edu/dissertations_mu/103

CONTENT DEVELOPMENT OF THE RELATIONSHIPS WITH ALCOHOL SCALE
FOR LATE-ADOLESCENTS

by

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A Dissertation submitted to the Faculty of the Graduate School,
Marquette University,
in Partial Fulfillment of the Requirements for
the Degree of Doctor of Philosophy

Milwaukee, Wisconsin

August 2012

ABSTRACT
CONTENT DEVELOPMENT OF THE RELATIONSHIPS WITH ALCOHOL SCALE
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Level of functioning is an important component of comprehensive assessments of adolescent alcohol use behavior. However, comprehensive adolescent substance use measures fail to provide a clear conceptual framework for understanding how alcohol use impacts functioning. Recent research (Lucey, 2009) suggests that alcohol use does negatively impact late-adolescent functioning and it is important to measure an adolescent's alcohol-use behavior and its consequences in conjunction with level of functioning. Thus, a biopsychosocial measure of the impact of alcohol use on late adolescent functioning entitled the Relationship with Alcohol Scale (RAS) was proposed. Items for the RAS were developed from a review of the adolescent and adult alcohol use literature and interviews with late-adolescents. The purpose of the proposed study was to determine the content domains, domain definitions and item relevance of the RAS. Two sequential studies were conducted.

Study I consisted of 20 late-adolescent participants. Participants completed a simple sorting task with the 192 items, in which they were instructed to sort items into piles representing similar areas of life affected by alcohol use. A Multidimensional Scaling analysis and follow-up cluster analysis identified 6 content domains: 1) Social Role Performance, 2) Interpersonal Functioning, 3) Alcohol Use Behavior, 4) Personal Health and Hygiene, 5) Legal-Financial Problems, and 6) Psychological Well-Being. Domain definitions were obtained by reviewing the item clusters obtained from the cluster analysis.

Study II consisted of 50 late-adolescent participants. Participants completed a Q-sorting task, where they were instructed to rate each item within the 6 content domains based on how relevant they were to the domain definition. Aiken's (1980) Validity Indexes were used to identify the most relevant items of the content domains. A total of 45 items were removed from the RAS.

The results of this study identified 6 content domains (4 level of functioning and 2 alcohol use behavior/consequences domains) for a total of 147 items. The strengths of the RAS are its biopsychosocial framework, its use of late-adolescents as content "experts" to identify salient content domains and the use of empirical methods to determine content domains and item relevance. Further studies will need to be conducted to reduce the number of items and to evaluate the psychometric properties of the RAS.

ACKNOWLEDGMENTS

Rose Lucey Schroedl, M.A., M.S.

The successful completion of this project could not have happened without the support, guidance and encouragement of many important people. First, I would like to thank my committee members for their feedback and intellectual discourse. Thank you to my advisor, Dr. Todd Campbell, for his words of encouragement and belief in my skills and ability as a scientist and clinician. You have allowed me to find my own professional path. A special thanks to Dr. Mike Brondino for his knowledge of MDS and computer programming. Thank you for providing me the opportunity to run with this topic. My gratitude to Dr. Tim Melchert for your challenging feedback and kindness throughout this process. I would also like to thank Jodi Weber, principal at Tenor High School, and Stephanie Steinbach, assistant principle, for recruiting students to participate in this study.

I would like to thank my friend and colleague, Sara Hegerty, for her support both near and far. You are an inspiration to ladies like us. Thank you to my husband and best friend, Bill, for the frequent and needed reality checks. Thank you for encouraging me to play, helping me recruit those last few participants and letting me work on this project on our honeymoon. You are the greatest support I have ever had!

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CHAPTER I INTRODUCTION

Alcohol use disorders emerge as part of an epigenetic process, where individual and environmental factors interact to create the end phenotype: an alcohol use disorder. The specific individual and environmental factors which impact the epigenetic process vary considerably with regard to individual factors and the presence of risk/protective factors, which determine the differential trajectories of alcohol use behavior and the end phenotype of alcohol use disorders in adulthood (Zucker et al., 2000). A number of risk factors, including cultural, interpersonal, psycho-behavioral and biogenetic have a differential impact on alcohol use behavior depending on the developmental stage of the individual (Mayes & Suchman, 2006). Further, risk is nested within an ecological system, such that the multiple domains and levels of risk interact through a dynamic process, from which differential developmental trajectories emerge as a result of the cumulative effects of these risks (Zucker, 2003; 2006). The emergence of these trajectories is evident during adolescence. While the initiation and experimentation with alcohol is common during adolescence, the pattern and course of alcohol use differs, with some adolescents experiencing an age-limited period of heavy alcohol use, while others demonstrate continuity in their problematic alcohol use into adulthood (Brown et al., 2008).

While alcohol use is thought to have a negative impact on an adolescent's psychosocial functioning, the research literature is mixed. The literature suggests that the outcomes experienced by adolescents who use alcohol depend on the particular pattern of alcohol use they exhibit and the specific developmental period in which alcohol use was initiated (Hill, White, Chung, Hawkins & Catalano, 2006). Some longitudinal research

has demonstrated a continuity of alcohol use behavior and its associated negative psychosocial outcomes from mid-adolescence through early adulthood (Wells, Horwood & Fergusson, 2004; Hill, et al., 2006). However, there is little evidence that adolescent alcohol use has a direct impact on psychosocial functioning later on in adulthood, rather adolescent alcohol use and its associated acute negative psychosocial outcomes may have an indirect impact on later adult functioning through a cumulative risk process in which adolescent alcohol use behavior and its acute psychosocial outcomes interact with other psycho-behavioral risk factors to promote the continuity of alcohol use behaviors and negative psychosocial functioning in adulthood.

It has been hypothesized that the continuity of negative behavior from adolescence into young adulthood reflects a failure to develop competencies in one stage of development or another. Catalano and Hawkins (1997) proposed that the development of social competencies builds from one developmental period to the next. Therefore, without the proper skills and opportunities to engage in these behaviors early on, they fail to develop and the individual is unprepared to engage in the prosocial behavior required of them later on in life. In addition, periods of developmental transition, such as late-adolescence, represent periods of opportunity or vulnerability for the establishment of health-related behaviors, such as alcohol use behavior (Shulenberg et al., 1997). In the case of problematic alcohol use behavior late adolescence represents a transition period in which social/cultural factors (i.e., social norms permitting the misuse of alcohol), interpersonal factors (i.e., decreased parental monitoring and increased peer exposure) and psycho-behavioral factors (i.e., increased sensation seeking and impulsive behavior) may lead to the establishment of problematic alcohol use behavior in late adolescence

and its continuity into early adulthood (Wells et al., 2004). Further, late adolescence (16 to 20 years of age) is a developmental period characterized by a transition into more adult-like roles, including increased responsibility for daily life tasks, their behavior and their future, more independent and mature relationships, exploration of romantic and sexual relationships and preparation for adult occupational roles (Brown et al., 2008). Given that late adolescence is a developmental period characterized by great transition, that developmental transitions are times of opportunity and/or vulnerability for the establishment of healthy behaviors (Brown et al., 2008; Shulenberg et al., 1997) and that there is continuity in psychosocial functioning through the development of competencies (Catalano & Hawkins, 1997; Clausen 1991), problematic alcohol use behavior in late-adolescence may interfere with the development of competencies which allow for an effective transition into adulthood, such that negative functioning in late adolescence as it is related to problematic alcohol use (i.e., blackouts, risky sexual behavior, negative behaviors) may impact the late adolescent's ability to engage in the life-roles and tasks necessary for an adequate transition to the social roles of early adulthood (Brown et al., 2008; Shulenberg et al., 1997; Catalano & Hawkins, 1997; Clausen, 1991).

Shulenburg and colleagues (1997) noted that due to both the opportunity and vulnerability of developmental transitions on health related behavior, the challenge for clinicians is how to influence the developmental transition in order to promote the continuity of health-promoting behaviors and discontinuity of health-risk behaviors. The continuity and discontinuity of health-related behavior is not singularly determined; it does not emerge from a single behavior, at one particular time point, but rather as a developmental process, which has multiple determinants, which cumulatively and

differentially impact functioning across the life-span (Zucker, 2003; 2006). This suggests that treatment for problematic alcohol use behavior in late adolescence should not merely focus on changing an adolescent's alcohol use behavior, as this alone does not necessarily promote positive long-term outcomes (Wells et al., 2004), but should also focus on the enhancement of protective factors such as positive functioning during adolescence, in order to promote social competencies and prepare the adolescent for future life roles. This proposition is consistent with salutogenic models of mental health (Keyes, 2007; Strupp & Hadley, 1977), which defines mental health as the presence of subjective well-being, the absence of symptoms and presence of adaptive functioning. Howard and colleagues (1993) further suggest that the goal of psychotherapy should not be limited to symptom reduction, but also address subjective well-being and level of functioning, in order to promote client mental health and improve treatment outcomes.

Comprehensive clinical assessment in adolescent alcohol use treatment should extend beyond the assessment of patterns of alcohol use and diagnostic symptoms to include measures of subjective well-being and level of functioning as it relates to the adolescent's alcohol use behavior (Keyes, 2007; Strupp & Hadley, 1977; Howard et al., 1993). Of particular importance is the inclusion of clinical measures of level of functioning in the clinical assessment process, as an adolescent's current level of functioning is the best predictor of later functioning (Shulenberg et al., 1997). Further the adolescent alcohol use literature suggests that perhaps problematic alcohol use in adolescence may affect later adult functioning indirectly (Wells et al., 2004; Hill et al., 2000) by impacting an adolescent's current level of functioning and their ability to develop social competencies and develop new social roles (Catalano & Hawkins, 1997;

Clausen, 1991). Thus the clinical assessment of level of functioning for an adolescent in treatment for problematic alcohol use behavior may be an important marker of treatment outcome and mental health (Strupp & Hadley, 1977; Keyes, 2007; Howard et al., 1993) and later functioning (Shulenberg et al., 1997).

Statement of the Problem

Assessing an adolescent's level of functioning is difficult, due primarily to the variability in how functioning is defined within the literature, disagreements about what domains are necessary to measure and who should be providing the information about an individual's functioning (Winters, Collett & Myers, 2005).

The measures currently available for the assessment of an adolescent's level of functioning, both in the alcohol use literature and global level of functioning literatures, vary in how functioning is operationalized and measured. The common definition of level of functioning contains both negative and positive components: adaptive functioning and functional impairment (Winters et al., 2005), where adaptive functioning is the ability of an individual to meet the demands of the social environment through adequate social role performance and functional impairment is the inability of an individual to meet the demands of the social environment, as manifested in deficits in social role performance. Inspection of the domains of functioning included in commonly used measures of adolescent level of functioning indicate that school/work performance, interpersonal relationships with family and peers, home duties/daily self-care activities and self-fulfillment/social activities are important domains to include in a global adolescent level of functioning measure (Shaffer, Gould, Brasic, Ambrosini, Fischer, Bird, et al., 1983;

Hodges & Gust, 1995; Bird, Canino, Davies, Ramirez, Chavez, Durante, et al., 2005; Price, Spence, Sheffield & Donovan, 2002).

While the adolescent alcohol use literature and level of functioning literature provide a conceptual starting point for the development of a measure which indexes the affects of alcohol use on late-adolescent functioning, this conceptual starting point is limited by our understanding of how to define functioning and how alcohol use affects functioning. Recent research (Lucey, 2009) determined that adolescent alcohol use has an impact on an adolescent's intrapersonal functioning, interpersonal functioning and social role performance at school and work. However, the data revealed that in order to understand how alcohol use impacts functioning, it is important to take into consideration the adolescent's alcohol use behavior and its consequences as it provides the context for understanding alcohol-related functional impairment. Therefore, it is not sufficient to measure one component of an adolescent's involvement with alcohol, such as alcohol use behavior or level of functioning. Rather, it appears that taking a broader approach, in which the biological, psychological and social aspects of alcohol use are accounted for in a measure may provide a more valid and useful manner in which to capture an adolescent's involvement with alcohol. The proposed Relationships with Alcohol Scale is a biopsychosocial measure of a late-adolescent's alcohol use behavior and its consequences and its impact on intrapersonal functioning, interpersonal functioning and social role performance at school and work.

Purpose of the Study

The purpose of the current study is to develop the content of a biopsychosocial measure which indexes the impact of alcohol use on late-adolescents' functioning. The

proposed measure is entitled: The Relationship with Alcohol Scale: The following hypothesis and research questions will guide the two studies.

Study I

1. It was hypothesized that a 10-dimension solution would be obtained from a Multidimensional Scaling analysis of the Relationship with Alcohol Scale. The 10-dimensions will represent the following content domains: 1) Psychological/Emotional Well-Being, 2) Behaviors Promoting Well-Being, 3) Interpersonal Functioning, 4) Behaviors Organized Around Alcohol Use, 5) Decision-Making Related to Alcohol Use, 6) Physical Affects of Alcohol Use, 7) Legal Problems, 8) School Performance, 9) Work Performance and 10) Violation of Other's Rights.

Study II

2. Which items are the least relevant to the content domains obtained from Study I?
3. What is the final item set which maximizes item relevance of the content domains?

Definition of Terms

Level of Functioning

“Level of functioning”, is defined as the ability to meet the demands of the environment, including social role performance, interpersonal relationships and self-fulfillment/ leisure time (Bird & Gould, 1995). For this study, the specific definitions for the areas of functioning thought to be impacted by alcohol use are defined as follows:

1. **Interpersonal Functioning** are feelings and thoughts related to psychological and emotional well-being, as well as behaviors promoting well-being.
2. **Intrapersonal Functioning** is how an individual interacts and treats their friends, peers, boyfriend/girlfriend/significant other, parents and family members.
3. **Social Role Performance** is defined as the ability of an individual to meet school employment demands.

Alcohol Use Behavior

“**Alcohol use behavior**” is defined as decision-making related to alcohol use, behaviors related to planning, hiding and using alcohol, the physical affects of alcohol intoxication and the legal consequences of alcohol use.

Content Validity

“**Content validity**” is defined as the evidence of the match between the items on a measure and the content domain to which generalization is sought (Hoyt et al. 2006). Evidence of content validity includes the domain definition (i.e., the operational definition of the content domain), relevance of items to the domain definition and the Representatives of items from the content domain (Messick, 1998, Sireci, 1998).

Importance of Study

The importance of the current studies is they will establish a content valid set of items suitable for further psychometric development. The development of a late-adolescent alcohol use involvement measure could be used in both clinical and research settings to improve our understanding of the biopsychosocial impact of alcohol use on

late-adolescent functioning and help identify late-adolescents at greatest risk for short and long-term functional impairment related to their alcohol use.

CHAPTER II REVIEW OF THE LITERATURE

According to the 2007 *Monitoring the Future* national survey, by the end of high school, 72% of adolescents have consumed alcohol in their lifetime and 39% have done so by the 8th grade (Johnston, O'Malley, Bachman & Schulenburg, 2008). Further, among 12th graders, 3% reported engaging in regular daily drinking, 25% reported engaging in binge drinking within the past 2-weeks and 30% reported having been drunk in the past 30-days (Johnston, O'Malley, Bachman & Schulenburg, 2007). The initiation and experimentation with alcohol during adolescence is thought of as a normative process among adolescents (Clark, 2004). While alcohol use during adolescence is normative, there is a subset of adolescents who develop problematic alcohol use patterns which require intervention. In fact, on an average day 72 adolescents enter outpatient treatment for problematic alcohol use (Substance Abuse and Mental Health Administration, 2007).

Given the number of adolescents who enter treatment for problematic alcohol use, developmentally appropriate clinical assessment of an adolescent's alcohol use behavior is essential for treatment referral, treatment planning and tracking client outcomes (Winters, 2006). Level of functioning assessment has been identified as an important, long-term outcome marker of success in adolescent alcohol use treatment, characterized by an adolescent's return to previous levels of social role performance and the development of new social roles (Adrians, Lucey & Campbell, 2007). Additionally, level of functioning assessment has been identified as an important process measure that clinicians can use to monitor client progress in treatment (Howard et al., 1986), as well as predict adolescent outcomes in treatment (Brown, 2004). A number of authors (Brown,

2004; Bukstein & Winters, 2004; Howard et al., 1986) have advocated for including level of functioning measures in adolescent alcohol use research and treatment. However, neither the adolescent alcohol use literature nor the level of functioning literature provides clear recommendations for how to effectively measure level of functioning for adolescents in general, nor specifically for adolescents with alcohol use problems.

Adolescent Alcohol Use Behavior

Pattern of Use

Adolescent alcohol use follows a general pattern, in which the consumption of alcohol steadily increases from early adolescence and peaks in early adulthood. Generally, during early adolescence an individual has had their first drink of alcohol, but does not drink regularly and by late adolescence binge drinking begins to emerge (Clark, 2004). This reflects a normative pattern of alcohol use in adolescence, in which alcohol use is thought of as a “rite of passage” into adulthood.

Within this general pattern of alcohol use behavior in adolescence there is great variability in how these patterns manifest themselves, with regard to onset, quantity and frequency of use and course (Zucker, 2006). Traditionally, adolescent alcohol use behavior has been treated as a discrete manifestation of problem behavior or disorder, separated from early developmental history and later adult outcomes. The developmental psychopathological perspective, on the other hand, conceptualizes alcohol use disorders as developmental disorders, with antecedents in childhood and adolescence which manifest themselves as the symptoms that represent the adult diagnosis of alcohol use disorder. Therefore, adolescent alcohol use behavior is not the end phenotype, but rather

is an intermediary marker of potential adult alcohol use disorders (Zucker, 2003, 2006; Zucker, Churmack & Curran, 2000; Brown, 2008).

A developmental psychopathological perspective describes adolescent alcohol use behavior and later adult outcomes as pathways or trajectories which are defined by childhood antecedents, age of onset, alcohol drinking patterns and alcohol related outcomes and consequences (Clark, 2004). Through a combination of theoretical and empirical research utilizing person-centered analyses (Maggs & Schulenberg, 2006), three general trajectories of alcohol use behavior have been identified in the adolescent alcohol use literature: 1) developmentally limited heavy drinking, 2) severe chronic heavy drinking, and 3) late onset heavy drinking (Brown, McGue, Maggs, Schulenberg, Hingson, Swartzwelder et al., 2008). Developmentally limited heavy drinking was initially conceptualized as a unitary trajectory characterized by an early onset of problematic alcohol use behavior, which is limited to the adolescent time period and is consistent with developmentally normative process of engaging in risky-behavior (Zucker et al., 2000). However, within the trajectory of developmentally limited heavy drinking there are identifiable sub-trajectories, which have differential patterns of use and onset, but share the characteristic of being limited to the adolescent time period (Brown et al., 2008). One subgroup of the developmentally limited heavy drinking is termed “fling heavy drinking”, which is characterized by initiation of alcohol use in early adolescence and a steady increase in frequency of use, binge drinking and drinking until intoxicated. This pattern develops over the adolescent period and peaks around 21 years of age, possibly due to the developmental transition to adult roles (Maggs & Shulenberg, 2006; Clark, 2004). Longitudinal studies of long-term outcomes of different alcohol use

trajectories from adolescence to middle age indicate that individuals identified as fling drinkers in adolescence have a low probability of receiving an alcohol use disorder diagnosis in adulthood (Jacob, Bucholtz, Sartor, Howell & Wood, 2005).

A second subgroup of developmentally limited heavy drinking shows the opposite pattern of use as compared to fling heavy drinkers. This trajectory is commonly referred to as “decreasers”, which is characterized by early onset of heavy drinking and a steady decrease in use over the course of adolescence (Brown et al., 2008). Prospective longitudinal research has indicated that adolescents in this trajectory show a peak use at age 16, which steadily decreases until age 18 (Wiesner, Weichold & Silbereisen, 2007).

The other two trajectories identified in the literature, chronic heavy drinking and late-onset heavy drinking, represent two problematic alcohol use trajectories in adolescence (Brown et al., 2008). Severe chronic heavy drinking is characterized by early onset that is persistent and stable across adolescence into adulthood. While the late-onset heavy drinking trajectory is characterized by a later onset of heavy drinking that steadily increases from late adolescence throughout adulthood. These two trajectories have been also conceptualized, not by pattern of alcohol use, but rather by the comorbid psychopathology that often occur with these two trajectories. The severe chronic heavy drinking trajectory has been termed the “antisocial alcoholism” trajectory by Zucker and colleagues (2000); in which aggressive and deviant behavior occur in conjunction with the early onset of heavy drinking that is stable across adolescence. This trajectory has been further characterized by the presence of a positive family history for alcohol use disorders and poor executive functioning, that is poor decision making, poor emotional and behavioral regulation and impulsivity (Brown, 2008). The late-onset heavy drinking

trajectory has been conceptualized as the “negative affect” trajectory, characterized by the presence of internalizing disorders, such as depression or anxiety, and poor emotional regulation (Zucker et al., 2000; Brown, 2008).

Both trajectories share a common hypothesized etiology, psychological dysregulation or behavioral under-control, in which an individual has difficulty regulating emotional and behavioral responses, possibly due to a general genetic liability which interacts with environmental factors to create two distinct pathways for problematic alcohol use behavior (Clark, 2004).

Risk and Protective Factors for Problematic Alcohol Use Behavior

The developmental psychopathological model of alcohol use disorders is a systemic, multi-level approach to understanding alcohol use behavior. Specifically, the model suggests that there are processes, both within the individual and external to the individual, which operate at multiple levels and interact, to influence the development of alcohol use behavior. Furthermore, these processes are not consistent across development, but rather have a differential impact on alcohol use behavior depending on the developmental time period (Zucker, 2003; 2006). Alcohol use disorders emerge as part of an epigenetic process, in which individual and environmental factors interact to create the end phenotype: alcohol use disorders. However, the specific individual and environmental factors which impact the epigenetic process vary considerably with regard to individual factors, social structure and the presence of risk/protective factors, which determine the differential trajectories of alcohol use behavior and the end phenotype of alcohol use disorders in adulthood (Zucker et al., 2000).

From a developmental perspective, a number of risk factors are thought to be in place early in childhood (Brown et al., 2008) with specific risk factors having a differential impact on alcohol use behavior depending on the developmental stage of the individual (Mayes & Suchman, 2006). Further, risk is nested within an ecological system, such that the multiple domains and levels of risk interact through a dynamic process, from which differential developmental trajectories emerge as a result of the cumulative effects of these risks (Zucker, 2003; 2006).

The initiation and progression of alcohol use behavior during adolescence does not occur in a social vacuum, but rather occurs within the context of cultural norms about alcohol use and social regulation of alcohol. Within the United States the purchase and use of alcohol is restricted to adults over the age of 21, in an attempt to restrict the availability of alcohol to particular groups of individuals and the ultimate goal of impacting drinking behavior by limiting availability (Zucker, 2006). While on the one hand the societal regulations in the United States attempt to limit the availability of alcohol to adolescents, cultural norms permit and even condone the initiation of alcohol use during adolescence and its progression into heavy drinking in late adolescence, which cumulates with the 21st birthday celebration (Fitzgerald & Zucker, 2000), thus creating a “societal ambivalence” towards alcohol use during adolescence (Zucker, 2006),

Nested within the social/cultural macrosystem are interpersonal risk factors associated with parental, sibling and peer interactions and relationships. Familial and peer relationships represent the immediate social context where socialization occurs and from which values and beliefs about alcohol use emerge (Zucker, 2006). Overall, the research indicates that alcohol use by parents, siblings and peers predicts regular and heavy

alcohol use during adolescence (Hops, Andrews, Duncan, Duncan & Tildesley, 2000).

While alcohol use by a parent or peer is a general risk factor for adolescent alcohol use, the impact of this risk factor is not consistent over time and appears to have a differential effect on alcohol use behavior depending on the developmental time period, relationship quality and genetic vulnerability of the adolescent (Hops et al., 2000; Brown, 2008).

Parental alcohol use has been identified as a risk factor for the onset of alcohol use during early adolescence and development of heavy alcohol use in late adolescence (Poelen, Scholte, Willemsen, Boosma & Engles, 2007). Interestingly, parental influence appears to have a differential effect depending on the age of the adolescent, such that during early adolescence parental alcohol use is a particularly powerful risk factor for the initiation of alcohol use, while peer alcohol use appears to influence the continuation of alcohol use through out adolescence (Hops et al., 2000).

The familial context and the interpersonal processes which emerge from this context are hypothesized to be the link between parental behavior and adolescent alcohol use behavior. Parental disengagement has been identified as a significant risk factor for the transition into heavy alcohol use, while parental warmth and communication have been identified as protective factors against the transition into heavy alcohol use (Gilamo-Ramos, Turrisi, Jaccard, Wood & Gonzalez, 2004). Further, Hops and colleagues (2000) noted that parental modeling of alcohol use behavior is moderated by the quality of the parent-child relationship, such that parent-child dyads with low conflict increased the similarity between parent and adolescent alcohol use patterns as compared to high conflict parent-child dyads, suggesting that adolescents in high conflict relationships seek out social support outside of the family, potentially increasing their susceptibility to peer

influence, while those with low conflict parental relationships may be more susceptible to parental modeling. Therefore, parental modeling of alcohol use behavior is not necessarily a direct pathway to adolescent alcohol use behavior, but rather appears to be moderated by the quality of the parent-child relationship.

The quality of parenting behavior has also been linked to adolescent alcohol use behavior. Specifically, poor parental monitoring, permissive parenting style, excessive punishment and inconsistent discipline have all been linked to the onset of alcohol use behavior in adolescence (Brown, 2008; Hops et al., 2000). Parenting behavior is thought to impact alcohol use behavior through increased exposure to environmental contexts which provide more drinking opportunities within the community and increased time spend with deviant peer groups (Clark, 2004). It should be noted, that parenting behavior is not an alcohol-specific risk factor, rather it has been linked to other problematic and deviant adolescent behavior (Hops et al., 2000; Fitzgerald & Zucker, 2006).

From a developmental perspective, familial factors appear to have their greatest direct impact during early adolescence through modeling process of alcohol use (Hops et al., 2000), while other familial factors such as the parent-child relationship and parenting behaviors appear to be indirect risk factors which mediate peer influences on alcohol use behavior (Clark, 2004). Similar to the impact of familial factors on adolescent alcohol use behavior, peer related risk factors have a differential impact on adolescent alcohol use behavior (Li, Barrara, Hops & Fischer, 2002). Twin studies investigating gene-environment correlations on adolescent alcohol use behavior, as a function of peer group alcohol use, have found that peer influence had a differential impact on adolescent alcohol use behavior depending on genetic vulnerability, such that individuals with a high

genetic vulnerability have the greatest vulnerability to peer influences on alcohol use behavior (Harden, Hill & Turkheimer, 2008). The interaction between genetic vulnerability and peer group influence has also been found to be bi-directional, such that among adolescents who interacted with peers who used alcohol there was a greater expression of genetic vulnerability for alcohol use behavior, suggesting that deviant peer exposure allowed for the expression of genetic predispositions by providing increased opportunities to express the predisposition (Dick et al., 2007).

Other research has indicated that there is a differential impact of deviant peer exposure depending on the adolescent's pattern of alcohol use, such that adolescents engaging in a normative pattern of alcohol use behavior demonstrated a greater vulnerability to deviant peer exposure, while adolescents who engage in problematic alcohol use behavior are less vulnerable to deviant peer influence over time (Li et al., 2002). More specifically, deviant peer exposure appeared to accelerate the progression into heavy drinking for adolescents engaging in normative adolescent drinking patterns, while peer influence for heavy drinking adolescence appeared to plateau around 15-16 years of age. These findings suggest that for problematic heavy drinkers, peer influences have the greatest impact during early adolescence and less impact for problematic heavy users during late adolescence. This suggests that perhaps for these adolescents different risk factors, such as genetic vulnerability (Dick et al., 2007), may have a larger impact on the continuation of problematic alcohol use behavior.

Internalizing behavior, such as anxiety and depression, externalizing behavior, such as aggression, conduct disorder and oppositional behavior and cognitive/learning problems have all been identified as psycho-behavioral risk factors for the development

of problematic alcohol use behavior (Masten et al., 2008). The unifying theme between these risk factors is the concept of psychological regulation (Clark, 2004). Self-regulation is thought of as a pathway to alcohol use disorders in adulthood, such that the level of self-control or regulation may be the key risk/protective factor which influences all other risk/protective factors for the development of adolescent alcohol use behavior (Mayes & Suchman, 2006). Behavioral and emotional regulation is thought of as a general liability for a variety of externalizing and internalizing behaviors, as well as alcohol use behavior, which is genetically influenced. Twin studies have provided initial evidence for a shared genetic liability for alcohol use disorders and behavioral dysregulation, such that alcohol use disorders and conduct disorder share 50% of their genetic variance (Button, Rhee, Hewitt, Young, Coreley & Stallings, 2007).

A “problem behavior” pathway for alcohol use disorder, characterized by behavioral dysregulation in early childhood, has been proposed in the literature (Zucker, 2003; 2006). Prospective studies have identified behavioral dysregulation, manifested as aggression in childhood, in combination with adolescent alcohol use, predicts an alcohol use disorder at age 28 (Englund, Egeland, Oliva & Collins, 2008). Fothergill and Ensminger (2006) found a similar problem behavior pathway which was characterized by behavioral dysregulation measured as aggression in the first grade, in combination with adolescent alcohol use predicted adult alcohol use disorders. However, behavioral dysregulation, measured as aggression, was an indirect predictor of adult alcohol use. This suggests that behavioral dysregulation may be an underlying liability, which in combination with other risk factors, including familial factors and peer context, create different developmental trajectories of alcohol use behavior in adulthood.

Self-regulation can be conceptualized as a psycho-behavioral risk factor, as it impacts the emotional and behavioral capacities of an individual, which in turn impact an individual's overt behavior and ability to adapt to the environment (Mayes & Suchman, 2006) or a biogenetic risk factor for the development of alcohol use disorders, which is biologically based and genetically determined process. Twin studies have indicated that approximately 50% of the genetic influence on alcohol use behavior in adolescence can be accounted for by the presence of behavioral dysregulation (Button et al., 2007). However, approximately 50% of the genetic influences on alcohol use behavior in adolescence is unique to alcohol use behavior. This finding is consistent with the literature investigating the heritability of alcohol use disorders, which indicates that 30%-70% of alcohol use disorders can be accounted for by genetic factors (Kendlerl, 2001). Additionally, specific genetic effects for alcohol use behavior have been identified, which affect neurotransmitter pathways and the metabolism of alcohol (O'Brien, Anthony, Carroll, Childress, Dackis, Diamond et al., 2005). This suggests that there is a genetic liability for biological differences in brain systems and metabolic process, which impact the experience of the intoxicating effects of alcohol. In addition, there also appears to be a non-specific genetic risk for behavioral dysregulation, which may have an indirect effect on the later development of alcohol use disorders.

In summary, the developmental psychopathological framework of alcohol use disorders suggests that alcohol use disorders are developmental disorders (Zucker, 2006), such that alcohol use disorders do not emerge full blown during adulthood, but rather are a progressive disorder that has identifiable precursors in childhood and adolescence (Zucker et al., 2000). In its comprehensive approach to describing the development of

alcohol use disorders, this framework accounts for the heterogeneity of alcohol use behavior that emerges during adolescence, by identifying differential alcohol use trajectories which differ in etiology, onset and course (Zucker, 2006).

Level of Functioning

The Impact of Alcohol Use on Level of Functioning

The research on the impact of adolescent alcohol use on an adolescent's behavioral, social and emotional functioning is mixed. Longitudinal studies have reported that of adolescents who have used alcohol in the past 6 months, 75% have experienced at least one negative outcome related to their alcohol use (Windle & Windle, 2006). Some of these negative outcomes are acute, such as experiencing blackouts, engaging in risky health behavior, neglecting responsibilities and engaging in negative behavior (Arata, Stafford & Tims, 2003). While other outcomes related to alcohol use are hypothesized to have a longer-term impact on an adolescent's functioning, including problems with peers, school, physical health and the legal system (Brown et al., 2008). However, not all adolescent alcohol use behavior results in negative outcomes. In fact, some studies have suggested that normative alcohol experimentation during adolescence has a positive impact on functioning, including promoting independence and social relationships (Brown et al., 2008) and promoting greater psychological well-being in adulthood, as compared to abstaining and heavy drinking adolescents (Shelder & Block, 1991).

The literature suggests that the outcomes experienced by adolescents who use alcohol depend on the particular pattern of alcohol use they exhibit and the specific developmental period in which alcohol use was initiated (Hill, White, Chung, Hawkins & Catalano, 2006). Wells, Horwood and Fergusson (2004) identified four latent class

trajectories of alcohol use, with an abstainer trajectory with the lowest levels of alcohol use and no problems associated with alcohol use and an alcohol abusing trajectory which comprised the highest levels of alcohol use and a number of problems related to alcohol use. The two other trajectories fell in between these two trajectories and were characterized by less alcohol use and alcohol related problems than the alcohol abuse trajectory, but more alcohol use and more alcohol related problems than the abstainer trajectory. Utilizing a longitudinal design of a birth cohort in New Zealand, they found evidence for the continuity of alcohol use behavior and its associated negative outcomes from mid-adolescence to early adulthood. Moreover, the findings indicate that outcomes at age 25 differed depending on the alcohol trajectory at age 16, such that adolescents with the highest levels of alcohol use and alcohol-related negative outcomes had the most deleterious outcomes in adulthood, including, depression, anxiety, suicidal behavior, poor educational attainment, risky sexual behavior, violent/illegal behavior and legal system involvement. Interestingly, when the authors controlled for baseline background characteristics, such as familial history of alcohol/drug use and mental illness, socioeconomic status, presence of internalizing or externalizing behavior problems, temperamental characteristics, tobacco and cannabis use, the only correlations with adolescent alcohol use which remained statistically significant were, alcohol specific outcomes (i.e., presence of an alcohol use disorder), number of sexual partners and violent offenses. This suggests that the continuity of alcohol use and alcohol related negative outcomes may be the result of general risk factors such as familial history, impulsivity and novelty seeking, rather than alcohol use per se. In fact, novelty seeking and impulsivity contributed the greatest amount of variance to alcohol use at age 16 and

alcohol dependence at age 25, suggesting that psycho-behavioral risk factors, specifically behavioral regulation, may play a large role in the continuity of alcohol use and alcohol-related outcomes in adulthood. Hill and colleagues (2000) utilizing a similar design and analysis procedure found similar results looking at binge drinking trajectories and the impact on adult outcomes. Prior to controlling for baseline background variables, the authors found that early onset heavy users had deficits in social competencies in adulthood and late-onset heavy drinkers had the highest levels of crime and alcohol/substance use disorders in adulthood. However, after controlling for baseline background characteristics, early onset heavy users were indistinguishable from non-binge drinkers with regards to outcomes in adulthood, suggesting that binge drinking did not directly predict adult outcomes, but rather was a contributing factor to an underlying condition which directly impacted adult outcomes. Taken together, these findings suggest that there is little evidence that alcohol use in adolescence has a direct impact on psychosocial functioning later on in adulthood, but rather that alcohol use in adolescence and its associated acute negative outcomes, may have an indirect impact on later adult functioning through a cumulative risk process in which adolescent alcohol use behavior and its acute negative outcomes interact with other psycho-behavioral risk factors to promote the continuity of alcohol use behaviors and negative psychosocial functioning in adulthood.

It has been hypothesized that the continuity of negative behavior from adolescence into young adulthood reflects a failure to develop competencies in one stage of development or another. Catalano and Hawkins (1997) proposed that the development of social competencies, that is the development of prosocial behavior or behavior that is

sanctioned by society, builds from one developmental period to the next. Therefore, without the proper skills and opportunities to engage in these behaviors early on, they fail to develop and the individual is unprepared to engage in the prosocial behavior required of them later on in life. This in turn may lead to negative adult outcomes which result from an underdevelopment of competencies, which are thought to promote positive functioning throughout the life span (DeLucia, 2004). In fact, Clausen (1991) proposed that the choices one makes in adolescence have an impact on major social roles taken in life, the stability of one's performance and the level of attainment one reaches in these roles. He further argues that this continuity between adolescent experiences and adult functioning has less to do with developmental sequence, but rather with readiness to engage in these roles. This suggests that an individual's level of functioning during adolescence will impact their later functioning in adulthood (Shulenberg, Maggs & Hurrelmann, 1997), either through the underdevelopment of social competencies (Catalano & Hawkins, 1997) and/or restricted opportunities and experiences which promote social role development, attainment and satisfaction (Clausen, 1991).

Developmental transitions represent periods of opportunity or vulnerability for the establishment of health-related behaviors, such as alcohol use behavior (Shulenberg et al., 1997). In the case of problematic alcohol use behavior late adolescence represents a transition period in which social/cultural factors (i.e., social norms permitting the misuse of alcohol), interpersonal factors (i.e., decreased parental monitoring and increased peer exposure) and psycho-behavioral factors (i.e., increased sensation seeking and impulsive behavior) may lead to the establishment of problematic alcohol use behavior in late adolescence and its continuity into early adulthood (Wells et al., 2004). Further, late

adolescence (16 to 20 years of age) is a developmental period characterized by a transition into more adult-like roles, including increased responsibility for daily life tasks, behavior and future, more independent and mature relationships, exploration of romantic and sexual relationships and preparation for adult occupational roles (Brown et al., 2008). Given that late adolescence is a developmental period characterized by great transition, that developmental transitions are times of opportunity and/or vulnerability for the establishment of healthy behaviors (Brown et al., 2008; Shulenberg et al., 1997) and that there is continuity in psychosocial functioning through the development of competencies (Catalano & Hawkins, 1997; Clausen 1991), problematic alcohol use behavior in late-adolescence may not be the direct cause of negative functioning in adulthood (Wells et al., 2004; Hill et al., 2000), but rather problematic alcohol use behavior in late adolescence may interfere with the development of competencies which allow for an effective transition into adulthood, such that negative functioning in late adolescence as it is related to problematic alcohol use (i.e., blackouts, risky sexual behavior, negative behaviors) may impact the late adolescent's ability to engage in the life-roles and tasks necessary for an adequate transition to the social roles of early adulthood (Brown et al., 2008; Shulenberg et al., 1997; Catalano & Hawkins, 1997; Clausen, 1991).

The Tripartite Model of Mental Health

Shulenburg and colleagues (1997) noted that due to both the opportunity and vulnerability of developmental transitions on health related behavior, the challenge for clinicians is how to influence the developmental transition in order to promote the continuity of health-promoting behaviors and discontinuity of health-risk behaviors. The continuity and discontinuity of health-related behavior is not singularly determined; it

does not emerge from a single behavior, at one particular time point, but rather as a developmental process, which has multiple determinants, which cumulatively and differentially impact functioning across the life-span (Zucker, 2003; 2006). This suggests that treatment for problematic alcohol use behavior in late adolescence should not merely focus on changing an adolescent's alcohol use behavior, as this alone does not necessarily promote positive long-term outcomes (Wells et al., 2004), but should also focus on the enhancement of protective factors such as positive functioning, in order to promote social competencies and prepare the adolescent for future life roles.

This is consistent with a number of conceptual models of mental health, which propose a comprehensive approach to mental health, such that mental health is defined by the presence of subjective well-being, absence of symptoms and presence of adaptive functioning (Strupp & Hadley, 1977; Keyes, 2007; 2006). This comprehensive model of mental health takes a salutogenic approach rather than a pathogenic approach to defining mental health, such that mental health is not merely the absence of mental illness (symptomatology), but also the presence of emotional well-being (subjective well-being) and positive functioning (Keyes, 2007). The tripartite model of mental health (Strupp & Hadley, 1977) has also been used to provide a framework for the psychotherapeutic process, such that the process of psychotherapy has three identifiable components: 1) decreasing distress and enhancing subjective well-being, 2) reducing the presence of symptoms and 3) improving level of functioning (Howard, Lueger, Maling & Martinovich, 1993). Research findings indicate that the three-phase model follows a sequential pattern, in which decreased distress and the establishment of subjective well-being must occur prior to the reduction of symptoms, and the reduction of symptoms

needs to occur prior to the improvement of functioning. Further, research has indicated that client treatment outcomes are maximized when this sequence is followed (Lueger, Howard, Martinovich, Lutz, Anderson, & Grissom, 2001; Lutz, Martinovich, Howard, & Leon, 2002; Lutz, Rafaeli, Howard, & Martinovich, 2002). Strupp and Hadley (1977) noted that the judgment of a positive outcome in psychotherapy and the judgment of mental health differs depending on the stakeholder making the judgment. They noted that clients are most likely to be concerned with improved well-being and will judge themselves mentally healthy and psychotherapy successful when they experience improved levels of positive affect and life satisfaction (i.e., subjective well-being). Mental health providers, on the other hand, are most concerned with the remediation of client symptoms and thus will judge psychotherapy successful when the quality and severity of a client's symptoms decrease. Finally, society is most concerned with how an individual functions within social relationships, institutions and their conformity to social norms. Therefore, society will judge a client to be mentally healthy and psychotherapy successful when the client's level of functioning in social relationships and institutions is stable, predictable and meets social standards. Strupp and Hadley noted that while these three components of mental health are related to each other, they are independent judgments of mental health, which can be at odds with each other. They further warned of the hazards of taking only one perspective into account when making judgments of mental health, as it can give an incomplete picture of the client, as each stakeholder, depending on their perspective, can have a different judgment of the client's mental health status.

The three-phase model of psychotherapy (Howard et al., 1993) and the tripartite model of mental health (Strupp & Hadley, 1977; Keyes, 2007; 2006) suggest that the goal of psychotherapy should not be limited to symptom reduction, but also address subjective well-being and level of functioning, in order to promote client mental health and improve treatment outcomes. As noted by Strupp and Hadley (1977) the components of the tripartite model of mental health are related to one another, but are distinct, independent components of mental health, a proposition supported by research on the three-phase model of psychotherapy, which indicates that the three phases are related to each other, in that one phase must be completed prior to starting the other, but that each is its own distinct phase, with distinct goals and required intervention (Howard et al., 1993). The inter-correlation between subjective well-being, symptomatology and level of functioning has been studied in both clinical and non-clinical samples alike. In fact, research on non-clinical adolescent populations support the conclusion that the presence of subjective well-being promotes optimal levels of functioning and development (Antaramian, Huebner & Valois, 2008). Further, level of functioning, specifically functional impairment is a key criteria for the diagnosis of most Axis I disorders in the DSM-IV-TR (American Psychiatric Association, 2004), implying that an individual's symptoms are severe enough to impact the ability of the individual to function effectively in social and occupational roles. In addition, the evaluation of an individual's subjective well-being is based on the match between an individual's personal criteria for a particular life domain, with their actual actions, thoughts and feelings (Andrew & Withey, 1979). Therefore, the presence of symptoms and/or functional impairment may lead to the

judgment of lowered well-being due to a mismatch between personal expectations and actual emotional and behavioral experiences.

A number of authors (Hoffmann, Mee-Lee, & Arrowood, 1993; Bergman, Smith & Hoffmann, 1995) have noted that assessing key adolescent characteristics can allow for individualized treatment that is potentially more effective for the specific needs and risk factors of a particular adolescent. Current salutogenic models of mental health (Keyes, 2007; 2007; Strupp & Hadley, 1977) and the three-phase model of psychotherapy suggest that comprehensive clinical assessment in adolescent alcohol use treatment, should extend beyond the assessment of alcohol use and diagnostic symptoms to include measures of subjective well-being and level of functioning as it relates to the adolescent's alcohol use behavior. Of particular importance is the inclusion of clinical measures of level of functioning in the clinical assessment process, as an adolescent's current level of functioning is the best predictor of later functioning (Shulenberg et al., 1997). Further the adolescent alcohol use literature suggests that perhaps problematic alcohol use in adolescence may affect later adult functioning indirectly (Wells et al., 2004; Hill et al., 2000) by impacting an adolescent's current level of functioning and their ability to develop social competencies and develop new social roles (Catalano & Hawkins, 1997; Clausen, 1991). Thus the clinical assessment of level of functioning for an adolescent in treatment for problematic alcohol use behavior is an important marker of treatment outcome and mental health (Strupp & Hadley, 1977; Keyes, 2007; Howard et al., 1993) and later functioning (Shulenberg et al., 1997).

Level of Functioning Assessment

Comprehensive Substance Use Assessments

Within the field of adolescent alcohol use behavior, symptomatology and level of functioning have been identified as important domains to assess for the purposes of treatment planning and referral (Winters, 2006) and tracking of adolescent treatment outcomes (Bukstein, & Winters, 2004; Brown, 2004; Wagner, 2008). Current adolescent alcohol use assessments do an adequate job in capturing an adolescent's past and current alcohol use behavior and symptomatology. A number of authors (Bukstein & Winters, 2004; Brown, 2004) have suggested a standardized set of core variables to measure within this domain, including DSM-IV-TR (APA, 2004) symptomatology, age of onset, periods of abstinence, quantity used in past month, 3 months and 6 months, average use per occasion and maximum use per occasion. It is important to note that the suggested core variables of current and past alcohol use do not merely focus on DSM-IV-TR (APA, 2004) symptomatology and the presence of an alcohol use disorder, in order to capture the heterogeneity of alcohol use behavior in adolescence. This is particularly important given the differential developmental patterns of alcohol use which emerge across adolescence and permits for identification of adolescent alcohol use behavior which is developmentally normative versus developmentally atypical (Wagner, 2008; Winters, 2006).

While the assessment of adolescent alcohol use behavior and symptoms is well established in the adolescent alcohol use literature, the measurement of psychosocial functioning is less well established, despite the identified importance of measuring level of functioning in adolescent alcohol use research (Bukstein & Winters, 2004) and its importance for monitoring client progress through treatment (Howard et al., 1986), as level of functioning is thought to be a long-term positive outcome of treatment, that is

characterized by a return to previous levels of performance in life roles and the development of new life roles (Adrians et al., 2007).

Three comprehensive adolescent alcohol and drug use assessments were identified from the literature (*Personal Experiences Inventory*, Winters, Stritchfeild & Latimer, 2004; *Teen-Addiction Severity Index*; Kaminer, Bukstein & Tarter, 1991; and *Adolescent Drug Abuse Diagnosis*; Friedman & Utada, 1989), based on the inclusion of an alcohol use behavior domain and a psychosocial functioning domain, wide use in the clinical and research literature and a claim by the authors to be developmentally appropriate for use with adolescents. The review of the measures presented here, focuses on the psychosocial domains of the assessments, their content as it relates to adolescent alcohol use behavior and how each measure addresses developmental context.

The Personal Experiences Inventory (PEI; Winters, et al., 2004) is a standardized measure designed to help in the identification of, referral for and treatment planning of adolescent alcohol and drug use problems. The PEI characterizes alcohol and other drug use by assessing the severity of psychological and behavioral involvement with alcohol and other drugs, the nature and style of use, the onset, frequency and course of use, psychiatric comorbidity and psychosocial risk and protective factors. The PEI is divided into two sections, a problem severity section and a psychosocial section, which are further divided into subscales. Table 2.1 presents the subscales and content of the psychosocial scales. The structure of the PEI reflects an attempt by the authors to capture the complexity and developmental nature of alcohol and other drug use behavior during adolescence, by conceptualizing alcohol use behavior as a multifaceted and dynamic phenomenon. Further, scores on the PEI are interpreted based on normative data, which

permit for the interpretation of scale elevations based on the normative developmental context, based on the adolescent's age.

Psychometric data on the PEI has been collected over the past decade in adolescent treatment centers, juvenile corrections and nonclinical adolescent school samples (Winters et al., 2004). The PEI subscales have demonstrated good internal consistency with coefficient alphas ranging from .70 to .97, depending on the subscale. The PEI has also demonstrated good convergent and divergent validity with other measures and the ability to discriminate between adolescents with no diagnosis from those with substance abuse from those with substance dependence.

One of the most interesting and unique components of the PEI is the inclusion of psychosocial scales in the measure. The purpose of these scales is to identify psychosocial problems which proceed or co-occur with alcohol and other drug problems, in order to include them in treatment planning and prognosis (Henely & Winters, 1989; Stinchfield & Winters, 2003). The psychosocial scales have cut-off T-scores which allow for the classification of adolescents as low-risk in a domain, which is interpreted as a strength, or as high-risk in the domain, which is interpreted as a risk factor. These strengths and risk factors can be used to inform treatment planning and may suggest a prognosis for the remission of problem behaviors. In addition, these scales can be conceptualized as markers of an adolescent's level of psychosocial functioning. Conceptually, the psychosocial scales are thought to reflect specific domains of functioning including, coping skills, and rejection of convention, deviant behavior, psychological distress and family problems (Winters et al., 2004).

The psychosocial scales have demonstrated convergent validity with other psychosocial functioning measures and differential validity with indirect measures of functioning, such as negative consequences and family disruption (Winters, Stritchfeld & Henely, 1996).

The psychosocial scales were not originally conceptualized as a direct measure of psychosocial functioning, but rather as a measure of personal and environmental risk. However, when a particular subscale pattern of elevations occur, they are thought to reflect psychosocial functioning in a given domain. Winters and colleagues (2004), through a rational approach, proposed five psychosocial domains measured by specific subscales of the PEI. Table 2.1 presents the five psychosocial functioning domains and their associated PEI subscales.

The psychosocial domains of the PEI have a number of strengths. First, scores on the PEI psychosocial scales are standardized and based on normative data. This permits for the interpretation of scale elevations in the developmental context of the adolescent that is by allowing for the interpretation of scores based on what is developmentally normal based on an adolescent's age. This is consistent with the findings from the developmental psychopathology literature on adolescent alcohol use, which indicates that behavior patterns, risk factors and outcomes vary depending on developmental time period. An additional strength of the psychosocial scales is the domains and content included in the measure. The purpose of the psychosocial scales is to assess risk factors which may affect treatment planning and prognosis for remission of problem behavior (Henely & Winters, 1986). The domains included in the psychosocial scales measure important risk factors and patterns of adolescent alcohol use behavior, all domains which

have been empirically identified in the literature as important for characterizing the severity of adolescent alcohol use behavior (Brown et al., 2008). It should be noted, however, that the PEI scales are not direct measures of psychosocial functioning. Rather

Table 2.1
Psychosocial Scales of the Personal Experiences Inventory

Subscale	Content	Psychosocial Domain
Negative Self-Image	Self-Esteem Self-Dissatisfaction Self-Efficacy	Psychiatric Distress
Psychological Disturbance	Mood Disturbance Thought Disturbance Anxiety/Worry	Psychiatric Distress
Social Isolation	Social Competency Social Comfort Trust of Others	Coping Skills
Uncontrolled	Rule Breaking Defying Authority Anger/Aggression	Delinquency
Rejecting Convention	Traditional Attitudes Traditional Beliefs	Attitudes/Beliefs
Deviant Behavior	Law-Breaking Delinquent Behavior Oppositional Behavior	Delinquency
Absence of Goals	Planning Future Orientation Goals/Expectations for Self	Coping Skills
Spiritual Isolation	Spiritual Beliefs Spiritual Experiences Use of Prayer	Attitudes/Beliefs
Peer Chemical Environment	Peer Drug Use	Delinquency
Sibling Chemical Use	Sibling Drug Use	Family Problems
Family Pathology	Family Dysfunction Physical/Sexual Abuse Family Drug Abuse	Family Problems
Family Estrangement	Parent-Child Relationship Family Coherence Family Warmth/Closeness	Family Problems

the authors propose clusters of scale elevations which reflect specific domains of psychosocial functioning (Winters et al., 2004). However, these clusters of scale elevations have not been empirically established, but rather developed based on a rationale approach.

The Teen-Addiction Severity Index (T-ASI; Kaminer et al., 1991) is a comprehensive assessment of adolescent alcohol and other drug use behavior, that is based on the Addiction Severity Index, an adult measure of substance use disorders (Bukstein & Winters, 2004). Adolescent alcohol and other drug use behavior, as measured by the T-ASI, is conceptualized as co-occurring with problems in psychosocial functioning, which result in negative consequences for the individual. Based on this conceptualization of adolescent alcohol and other drug use behavior, psychosocial functioning, which is affected by alcohol and other drug use, leads to poor outcomes (i.e., negative consequences). Therefore, in order to address these poor outcomes, a comprehensive assessment must not only measure patterns of substance use, but also the adolescent's psychosocial functioning, in order to address these functional impairments in treatment and in turn remediate negative outcomes (Kaminer et al., 1991).

The T-ASI is a semi-structured interview which assesses problem severity in the following seven domains: 1) chemical use, 2) school status, 3) family relationships, 4) employment/support status, 5) legal status, 6) peer-social relationships and 7) psychiatric status. The psychosocial functioning domains of the T-ASI and their content are presented in Table 2. Each domain consists of a number of questions which assess a variety of problems within each domain. The T-ASI is administered by a trained interviewer, who asks the questions and records the adolescent's responses. At the end of

Table 2.2
Psychosocial Domains of the Teen-Addiction Severity Index

Domain	Content
School Status	School Attendance Absences Tardies Skipped Class Disciplinary Measures Detention Suspension Grade Point Average Extracurricular Activities
Employment/Support Status	Educational Attainment Employment History Work Pattern Tardiness Missed Work Days Fired/Laid Off
Family Relationships	Living Arrangements Conflict Parents Siblings Other Family Members Familial Support Familial Communication Family Rules Physical/Sexual Abuse
Peer/Social Relationships	Friendship Quality Friend Drug Use Romantic Relationship Quality Romantic Partner Drug Use
Legal Status	Criminal History Criminal Convictions Criminal Charges Incarceration
Psychiatric Status	Treatment History Psychiatric Symptoms

each domain the adolescent is asked to rate the severity of the problem in that domain and their subjective need for treatment in that domain. The interviewer, based on the data collected through the assessment, also rates the severity of the adolescent's problem in the domain and their need for treatment in that domain. The problem severity profile produced by the T-ASI reflects the interviewer ratings of the adolescent's problem severity in a given domain and their need for treatment in that domain (Kaminer, et al., 1991).

The T-ASI has demonstrated inter-rater reliability for the severity and need for treatment items with Pearson's r correlations above .7 for all domains, except the family relationships domain (Kaminer et al., 1991). In a study establishing the validity of the T-ASI, concurrent validity was demonstrated between the chemical use domain and the substance use disorders domain of the K-SADS. Additionally, the school status and chemical use domains discriminated between adolescents who were diagnosed with a substance use disorder from those with no diagnosis. The validity evidence for the other domains of the T-ASI is limited with the exception of the psychiatric status domain, which was correlated with the externalizing problems scores on the Youth Self-Report of the Achenbach scales (Kaminer, Wagner, Plummer & Seifer, 1993).

One of the strengths of the psychosocial scales of the T-ASI is its comprehensive inclusion of psychosocial domains identified in the adolescent alcohol use literature (Bukstein & Winters, 2004; Brown, 2004; Wagner, 2008). However, what the T-ASI fails to account for is the differential effects of an adolescent's developmental context, as the T-ASI was developed for use with adolescents ranging from 12 to 18 years of age. In fact, inspection of the items for a number of domains may be developmentally

appropriate for older adolescents, who have more autonomy, a driver's license and an employment history, but may not be developmentally appropriate for early adolescents. Thus the T-ASI fails to account for the developmental factors and context which can impact the presentation of psychosocial functioning. Additionally, the T-ASI is structured such that the interviewer's ratings of the adolescent's problem severity determine their problem severity profile. The validity of this measure is threatened by interviewer bias, particularly given that problem severity profiles are based on the interviewer's judgment of severity, rather than on the responses obtained from the adolescent. As noted by Strupp and Hadley (1977) the use of only one perspective in the assessment process, may not provide a complete picture of the adolescent's mental health.

The Adolescent Drug Abuse Diagnosis (ADAD; Friedman & Utada, 1989) is a structured interview developed for the diagnosis of adolescent substance use disorders and for treatment planning. The ADAD is one of a number of adolescent assessments which are based on the adult Addiction Severity Index. However, unlike the T-ASI (Kaminer et al., 1991), the developers of the ADAD utilized both a rational and empirical approach in the development of the instrument. Questions on the ADAD were initially identified based on the descriptive research literature on problems experienced by adolescents who engage in problematic alcohol and drug use and later, subjected to psychometric testing in order to identify the items with the highest discriminative and predictive power. The ADAD consists of nine domains: 1) medical, 2) school, 3) employment, 4) social, 5) family, 6) psychological, 7) legal, 8) alcohol use and 9) drug use. Table 3 presents the content of the psychosocial domains of the ADAD (Friedman & Utada, 1989).

Table 2.3. *Psychosocial Domains of the Adolescent Drug Abuse Diagnosis*

Domain	Content
Medical Status	Medical History Major Illnesses Hospitalizations Quality of Physical Health Current Physical Symptoms
School History and Status	Educational Attainment Suspensions/Expulsions Educational Status Attendance School Problems Motivation Preparedness Learning Difficulties Disruptive Behavior
Employment	Work History Desire for Employment
Social Activities and Peer Relationships	Quality of Peer Relationships Peer Deviant Behavior Hobbies, activities Romantic Relationships Sexual Activity
Family Background and Relationships	Family Conflict Chores Family Psychopathology Familial Support/Care Oppositional Behavior
Psychological Status and Problems	Treatment History Mood Anxiety Cognitive Psychosis Suicidality/Homicidality
Delinquency/Criminal Behavior	Law Breaking

Similar to the T-ASI (Kaminer et al., 1991), the ADAD (Friedman & Utada, 1989) is administered by a trained interviewer, who reads the items aloud to the adolescent and records their responses. At the end of each domain of the ADAD, the adolescent is asked to rate the severity of their problem in the domain and their subjective need for treatment in this domain. The interviewer, based on the adolescent's responses to the domain questions, also provides ratings on the adolescent's problem severity and their need for treatment in a given domain. Additionally, the ADAD permits for the computation of composite scores, which are derived from mathematical algorithms, which were developed through an expert consensus process. These mathematical algorithms utilize the responses from key items to provide a problem severity index score for a given domain. While on the one hand the ADA attempts to utilize the information gathered from the interview to derive a composite severity index, the interpretation of the composite scores is unclear, as each domain's composite score is on a different scale, thus making identification of relative strengths and problems difficult (Chinet et al., 2005). Further, no normative data or cut-off scores are provided by the developers of the ADAD (Friedman & Utada, 1989), in order to aid in composite score interpretation (Chinet et al., 2005).

The psychometric properties of the ADAD are limited. The ADAD fails to discriminate between adolescents diagnosed with an alcohol use disorder from non-diagnosed adolescents (Friedman & Utada, 1989). However, some evidence for criterion-related validity has been demonstrated, with the ADAD being moderately correlated with other adolescent diagnostic interviews and demonstrating good sensitivity and specificity

(Kennington, 1995). With regard to reliability the ADAD has demonstrated moderate inter-rater reliability (Friedman & Utada, 1989).

The ADAD (Friedman & Utada, 1989) is similar in its structure and scoring to the T-ASI (Kaminer et al, 1991), as both assessments are based on the adult Addiction Severity Index. Therefore, the ADAD (Table 3) measures similar domains as the T-ASI (Table 2). However, inspection of the content of the ADAD domains, indicate that they are more developmentally appropriate for adolescents and include content which addresses developmental factors, such as chores and sexuality.

The psychosocial domains presented in Tables 1-3. of the PEI (Winters et al., 2004), T-ASI (Kaminer et al., 1991) and ADAD (Friedman & Utada, 1989), point to a set of psychosocial domains which appear to be common in comprehensive adolescent alcohol use assessments, including legal status, psychiatric status, interpersonal relationships, school/work performance, family functioning and medical status . While these measures include psychosocial domains as part of the assessment tool, the degree to which they adequately measure psychosocial functioning in a developmentally appropriate manner, is questionable. The biggest limitation of the psychosocial scales from the reviewed comprehensive measures is their limited consideration of developmental time period and factors which impact adolescent alcohol use behavior and psychosocial functioning. The research literature has begun to demonstrate that adolescent alcohol use behavior is affected by developmental level, with alcohol use patterns, risk factors and outcomes having a differential effect on adolescent alcohol use behavior depending on the developmental period of adolescence (Zucker, 2003; Brown et al., 2008). This may be particularly important in the assessment of psychosocial

functioning, given the suggestion in the literature that the continuity of poor psychosocial functioning may be due to a failure to develop social competencies and establish social roles for adequate levels of functioning in adulthood due to problematic alcohol use in adolescence and its acute impact on psychosocial functioning (Catalano & Hawkins, 1997; Clausen, 1991; Wells et al., 2004; Schulenberg et al., 1997). Therefore it is important for measures of alcohol specific level of functioning for adolescents be developmentally sensitive to the specific developmental factors and tasks which influence functioning as it is impacted by problematic alcohol use and not merely measure domains which are broadly developmentally appropriate.

Global Assessments of Level of Functioning

Assessing an adolescent's level of functioning is difficult not only for measures of adolescent alcohol use, but also for global, non-problem specific measures of level of functioning. This is due primarily to the variability in how functioning is defined within the literature, disagreements about what domains are necessary to measure and who should be providing the information about an individual's functioning (Winters, Collett & Myers, 2005). All definitions of level of functioning share two common conceptual characteristics. First, level of functioning is a construct which is always present to varying degrees for an individual. Thus, functioning cannot be measured as present or absent, but rather exists on a continuum (Camino, Castello & Angold, 1999). Second, functioning is the result of the interaction between the individual and the environment, such that the environment requires the individual to respond in some way and the individual responds according to the demands of the environment (Bird & Gould, 1995). Thus, functioning is the end behavioral product that results from interaction between the

demand of the environment and the ability of the individual to respond to that demand.

What these two characteristics tell us about the construct of functioning is that, it is dimensional in nature and is the end product of an interaction between the demands of the environment and the capacity of the individual to respond to that demand.

The literature distinguishes between functional impairment and adaptive functioning. Functional impairment is defined as the presence of specific deficits in multiple domains of role performance and role satisfaction that occur as a result of the onset of a disorder or life problem. Adaptive functioning is the ability of the individual to adjust to the demands of social roles and gain satisfaction from these roles. The ability to adapt is conceptually thought to be affected by the presence of global competencies, such as problem-solving and social skills, which impact the ability of the adolescent to adapt to the demands of their environment. This conceptual model proposes a mechanism by which an adolescent's level of functioning is impacted by the presence or absence of global competencies, which in turn impact the ability of the adolescent to meet the demands of specific life roles. that manifests itself in behavior which is identified as functionally impaired or adaptive for that life domain (Camino et al., 1999; Bird, 1999; Bird & Gould, 1995; Winters et al., 2005; Price, Spencer, Scheffield & Donovan, 2002). Based on this definition, three dimensions of adolescent functioning have been identified: 1) interpersonal functioning; 2) school/work performance; and 3) life satisfaction and use of leisure time (Bird & Gould, 1995). This definition conceptualizes the person-environment interaction as role performance that is the ability of the adolescent to fulfill the role demands in such life domains as school, work and interpersonal relationships (Winters et al., 2005). Interestingly, the distinction between functional impairment and

adaptive functioning suggests that level of functioning consists of negative components of functioning or impairment and positive aspects of functioning or adaptation. An important detail to note about this definition is that symptoms are not an inherent component of the definition. As suggested by many in the literature (Bird, 1999; Howard et al., 1993; Winters et al. 2005) the absence of symptoms does not necessitate an improvement in level of functioning. While functioning may be related to the presence or absence of symptoms, it is a distinct construct (Strupp & Hadley, 1977).

While there has been an increase in the number of level of functioning measures in the past two decades, level of functioning as a construct has remained vague, inconsistent and a-theoretical in nature. Further, level of functioning as a construct has been developed not from empirical work in clinical and basic psychological research, but rather based on expert knowledge and consensus (Winters et al., 2005).

The lack of conceptual clarity creates a number of challenges in the measurement of functioning in adolescents, including defining the construct of functioning to be measured, selecting domains to be measured and use of multiple informants to capture situation specific functioning (Winters et al., 2005). Here commonly used adolescents level of functioning measures are reviewed, for their conceptual definition of functioning and the content included in the measures.

The Child Global Assessment Scale (CGAS) is a global, unidimensional measure of functional impairment (Shaffer, Gould, Brasic, Ambrosini, Fischer, Bird, et al., 1983; Schorre & Vandvik, 2004). The CGAS has a range of 1 to 100 and is divided into 10, 10-point intervals in which each interval is related to a specific level of functional impairment. For example, a score of 50 on the CGAS corresponds to the following

anchor: “moderate degree of interference in functioning in most social areas or severe impairment in one area...” (Shaffer et al., 1983, pp. 1229).

The CGAS does not explicitly state the conceptual definition of functional impairment being measured; however, a general conceptual framework can be inferred from the behavioral descriptions used to define the 10 anchoring levels of the scale. The CGAS defines each of the 10 impairment levels of the scale with a combination of behaviors related to role performance, engagement in self-fulfillment activities (i.e., participation in extracurricular or organized activities) and severity of symptom expression. In addition, the structure of the scale indicates that level of functioning is conceptualized as a unidimensional construct of functional impairment, such that higher scores on CGAS indicate the adaptive functioning and low scores indicate functional impairment (Table 4). The definitions of the 10 impairment levels clearly reflect that the purpose of the scale is to provide a succinct yet clinically interpretable measure of the clinician’s knowledge of the adolescent. However, it is important to note that the CGAS does not specifically define functional impairment, which may be a reflection of how the

Table 2.4

Operational Definition of Functioning and Domains included in the Children’s Global Assessment Scale

Definition	Unidimensional global assessment of functional impairment, as measured by a combination of behaviors related to role performance, engagement in self-fulfillment activities and severity of symptom expression
Domains:	General Role Performance Participation in Non-Specific Self-Fulfillment Activities Symptom Severity

scale was adapted from the adult Global Assessment Scale (Hodges & Gust, 1995).

The CGAS derives an adolescent's level of functioning through clinician ratings, which are based on the gathering of information about the adolescent from parents, teachers, other professionals and the adolescent themselves. Interestingly, even though scores are derived from information gathered from multiple informants, the CGAS does not contain a standardized manner in which to gather this information, in fact the CGAS gives no direction on how clinical information should be gathered. In addition, the CGAS utilizes clinician ratings to derive level of functioning scores, which makes scores dependent upon the assessment situation and rater biases (Winters et al., 2005).

The Child and Adolescent Functional Assessment Scale (CAFAS; Hodges & Gust, 1995; Bates, 2001; Winters et al., 2005), is a global, multidimensional measure of life-functioning, which measures two domains of functioning (i.e., Role Performance, Behavior Toward Others) and three domains of symptoms (i.e., Substance Use, Mood/Self-Harm, Thinking; Table). One of the weaknesses of the CAFAS is the absence of an operational definition of functioning and a lack of any clear rationale for the inclusion of these particular domains of functioning (Bates, 2001). The drawback of including symptoms in a global measure of functional impairment is that it is impossible to disentangle symptom severity from functional impairment (Winters et al., 2005). The CAFAS is particularly confounded in the assessment of adolescents who use alcohol, as it includes a Substance Use domain in its assessment of functioning. Therefore, the CAFAS specifically connects alcohol use behavior to an adolescent's level of functioning. Thus,

Table 2.5
Domain Definitions for the Child and Adolescent Functional Assessment Scale

Domain	Definition
Role Performance	Ability to effectively fulfill role expectations in school/work, at home and in the community
Behavior Towards Others	Appropriateness of daily behavior
Moods/Self-Harm	Ability to regulate emotional life and presence of self-harm behavior
Thinking	Ability to use rationale thought processes
Substance Use	Degree of the appropriateness and disruptiveness of substance use

an adolescent who uses alcohol, level of functioning, as measured by the CAFAS, may not reflect actual impairments in functioning, but rather reflect their alcohol use behavior.

Similar to the CGAS (Shaffer et al. 1983), the CAFAS scores are derived based on clinical data gathered from multiple informants (e.g., parents, teachers, adolescent, medical files, etc.), which is then synthesized into an interviewer rating. Again, while the CAFAS attempts to utilize multiple informants and this information is synthesized by deriving an adolescent's level of functioning, it does not provide a standardized method in which to gather this information, rather information is gathered through record reviews, interviews and other relevant sources of information of the adolescent's functioning. It should be noted however, that a structured interview has been added to the CAFAS, but is neither required for deriving CAFAS scores nor is there any empirical evidence supporting the use of the structured interview (Bates, 2001).

The CAFAS differs, however, from the CGAS, in that the CAFAS attempts to address the problems of rater bias and clinical judgments, by including specific behavioral statements that the clinician must endorse in order to obtain scale scores. This method has been shown to have good inter-rater reliability with correlation coefficients ranging from .74 to .99 (Bates, 2001). However, the generalizeability of these findings are limited as reliability studies have only been conducted using clinical vignettes and not using data collected in a clinical setting (Bates, 2001).

Newer scales such as the Brief Impairment Scale (BIS; Bird, Canino, Davies, Ramirez, Chavez, Durante, et al., 2005) clearly define the construct of global functional impairment and operationalize the domains of functioning being measured. Moreover, the selection of the domains of functioning included in the BIS (interpersonal relationships, school/work performance and self-fulfillment) are directly related and driven by the larger conceptual framework and conceptual definition of functional impairment (Table 6).

Table 2.6
Operational Definition of Functioning and the Domains included on the Brief Impairment Scale

Definition:	Poor performance in interpersonal relationships, school/work performance, self-fulfillment activities, while taking care of one's self.
Domains:	School/Work Performance Interpersonal Relationships Self-Fulfillment Activities Daily Self-Care

The BIS utilizes the parents as the sole informant of the adolescent's functioning. The use of any single informant in the determination of level of functional impairment may limit the information obtained about the adolescent's level of functioning in that no one individual is likely to be able to provide information about the adolescent's functioning in every situation. Moreover, functional impairment is to a certain extent dependent on personal definitions and expectations about role performance and satisfaction (Bird et al., 2005), therefore parent report may reflect the parent's expectations of the adolescent's life-functioning, rather than the adolescent's or other possible informant's expectations.

As the BIS is a relatively new measure of life-functioning, the psychometric data on this scale is limited. However, initial studies of the BIS demonstrated high internal consistency ($\alpha > .80$). Correlation coefficient between the BIS and the CGAS were fair ($r = -.5$), providing some initial evidence for convergent validity. In addition, concurrent validity was demonstrated through a comparison of BIS scores to inpatient service utilization, in which adolescents with higher BIS scores reported more service utilization in the past year.

The Child and Adolescent Social and Adaptive Functioning Scale (Price, Spence, Sheffield & Donovan, 2002) defines functioning as a judgment of an individual's success at fulfilling expectations of a given society in a number of domains of life. From this broad conceptual definition the authors identified social functioning and the domains of interpersonal relationships, school/work, self-care, household duties and leisure/social activities, as the focus of the measure of global functioning. Based on this definition, the authors empirically identified four domains of social functioning (school performance,

peer relationships, family relationships, and home duties) through confirmatory and exploratory factor analyses (Table 7).

Table 2.7

Operational Definition and Domains Included in the Child and Adolescent Social and Adaptive Functioning Scale

Definition:	A judgment of an individual's success at fulfilling expectations of a given society in a number of domains of life
Domains:	School Performance Peer Relationships Family Relationships Home Duties

This measure utilizes a self-report format, in which the adolescent is the sole informant on their functioning. Similar to the BIS (Bird et al., 2005), the use of a single informant in the determination of functional impairment limits the information that can be obtained related to role performance in a number of life domains. The CASAFS has demonstrated good internal consistency ($\alpha = .81$). Additionally, the CASAFS was found to be negatively correlated with a scale of depression ($r = -.34$) and differentiated between clinically depressed and non-depressed adolescents, providing some initial evidence for concurrent validity. The current data on the validity of the CASAFS is limited and therefore further research is required to investigate the construct and predictive validity of this measure.

The measures currently available for the assessment of an adolescent's level of functioning vary in how functioning is operationalized and measured. An important step for the literature on level of functioning is to establish conceptual clarification around the

construct of functioning. Broadly speaking the level of functioning measures reviewed here are limited by their content validity, which threatens the overall validity of these measures. While content validity by itself is not sufficient for determine the validity of a measure (Hoyt et al., 2006), it is one important piece of evidence necessary for an integrated evaluation of a measure's validity (Messick, 1998).

Validity and Measure Development

In 1989, Messick defined validity as,

“... an integrated evaluative judgment of the degree to which empirical evidence and theoretical rationales support the *adequacy* and *appropriateness of inferences* and *actions* based on test scores and other modes of assessment.” (p. 13, italics in original).

This definition represents a shift in validity theory from conceptualizing validity as three separate concepts (i.e., content validity, criterion –related validity and construct validity), to a broader comprehensive view of validity, in which information about content, criteria and consequences are integrated to determine the appropriate meaning and interpretation of test scores (Messick, 1998). Validity has been identified as the most important psychometric quality of psychological measures, as validity determines the interpretation of test scores and how they are put to use both in psychological research and practice (Hoyt, Warbasse & Chu, 2006; Furr & Bacharach, 2008; American Psychological Association, 1999).

Subsumed under this broader view of validity is content validity; one of six general criteria for evaluating the validity of all measures. Content validity is evidence of the match between the items on a measure and the content domain to which generalization is sought (Hoyt et al. 2006). Thus content validity is concerned with the domain definition (i.e., the operational definition of the content domain), relevance of

items to the domain definition and the representatives of items from the content domain (Messick, 1998, Sireci, 1998).

Of paramount importance is the establishment of domain definition through the process of direct observation and of the phenomenon of interest in order to determine the behaviors, cognitions, attitudes, abilities, etc. that comprise the phenomena of interest. In addition, the scientific literature and theory are used to determine the domain definition (Messick, 1995). This later source of information is most applicable in the measurement of psychological phenomenon, as psychologists are often most interested in phenomena that are not directly observable.

While the domain definition is important for establishing content validity, it is equally important that the items developed for the measure are relevant and representative of the content domain. Traditionally, relevance and representativeness is evaluated by using experts in the field to make judgments of how well items match a domain definition. These judgments are then translated into congruency indexes which represent the degree of congruence between the expert's judgments and the objective criteria established by the domain definition (Sireci, 1998; Furr & Bacharach, 2008). Congruency indexes can be calculated for each item, providing an item-relevance index or across items within the domain to determine representativeness (Sireci, 1998).

Sireci (1998; Sireci & Geisinger, 1992) noted that one limitation of this method is the judgments provided by experts are not independent of the developer's a priori conceptualization of the content domain. Thus the judgment of experts are tied to the content blueprint established by the test developer and does not permit for alternative judgments outside of the domains determined by the test developer.

An alternative method for evaluating domain relevance and domain representativeness has been proposed (Sireci, 1998; Sireci & Geisinger, 1992), which asks experts to make judgments of similarity between items, rather than having experts match items to the domain definition. These similarity ratings are then analyzed using a multidimensional scaling (MDS) procedure, which provides a visual representation of the item similarity in multidimensional space. The visual representation or stimulus configurations in turn can be interpreted by assessing which items are most similar, based on their proximity in the multidimensional space. Sireci and Geisinger (1992) noted this method may be particularly useful in measure development for deterring the underlying dimensional structure of the measure and item selection through the identification of outlier items in the stimulus configuration and considered for removal.

In summary, validity is considered the most important consideration in measure development (APA, 1999). One aspect of validity which can be assessed and established early on in the development process is content validity, as one of the first steps in measure development is the development of item content. Further, the use of empirical methods early on in the measure development process may improve the overall psychometric properties of a measure.

Late-Adolescents' Perceptions of the Impact of Alcohol Use on Level of Functioning

Utilizing the content validity procedures outlined by Mesick (1995) the review of the adolescent alcohol use assessment literature and the general level of functioning literature provides some guidance for determining the content domain of a measure which indexes the impact of alcohol use on late-adolescent functioning. Utilizing the information gathered from the literature the content domains interest for such a measure

include: school performance, employment performance, family relationships, social-peer relationships, self-fulfillment/leisure/recreation, home duties/daily self-care, medical status and legal status. While these domains were derived from the literature, this framework is limited by lack of consensus in the literature on how to measure level of functioning, in general, and more specifically, by limited understanding of how alcohol use affects level of functioning.

In order to determine the representativeness of the proposed content domains, a qualitative interview study was conducted in order to improve our understanding of the impact of late-adolescent alcohol use on functioning across a range of behavioral domains and identify additional domains to be included in the measure (Lucey, 2009). Study participants included 10 (5 female, 5 male) participants between the ages of 18 and 20, recruited from a local private university. All participants had direct experience with alcohol use in the past year. Each participant completed an hour long individual interview which asked participants to personally define functioning, describe how alcohol affects level of functioning and read over and comment on the appropriateness of a set of 230 level of functioning items. Interviews were recorded, transcribed and analyzed for emergent themes.

An analysis of the interview data revealed three important themes regarding the context in which late-adolescent alcohol use occurs. First, late-adolescents' alcohol use occurs in a social context, in which *adolescents* perceive a social pressure to drink heavily. It was frequent for participants to note that they will often drink more than they intended because of perceived social pressure to do and not a compulsion to drink more. As one participant stated:

“I think people don’t necessarily want to be the party pooper. So once you start you are like “Okay I drink. I am okay with this.” Then it’s kind of hard to stop because you don’t want to be the only one, you don’t want to be a party pooper. And everybody else is, so there is that peer pressure element.”

The second contextual theme which emerged from the interview data was that late-adolescents drink alcohol with the intention of getting drunk. Participants consistently spoke of their alcohol use and those of others they know, as episodic, planned event, where an individual drinks alcohol with the purpose of becoming intoxicated. One participant commented on the item “I drank more to feel high” as follows:

“That is why you drink. To feel you know to feel less burden. You become less worried about social issues. I think in that way yes. I did drink more to feel high and that’s what a lot of my friends do.”

Consistently participants also spoke about the need to plan and organize their behavior around their alcohol use, because they are under the legal drinking age and thus need to plan how, when and where they will procure and drink alcohol:

“I have [planned when I was going to drink]. I look forward to a weekend. You know? I say okay. You know, like especially during football season... I can’t wait for this weekend. Or even if we just have a party on the weekend... and so you look forward to that.”

Participants were asked to describe what a young person their age who was functioning well. The analysis revealed three primary components of adequate functioning: intrapersonal functioning, interpersonal functioning and social role performance. Participants described intrapersonal functioning as consisting of two components: subjective well-being and the behaviors which promote subjective well-being. The subjective well-being component of Intrapersonal functioning was described

as the absence of psychiatric symptoms, such as depression, the presence of positive affect and being socially competent and satisfied with life. As one participant noted:

“Well, they’re friendly. They don’t seem like they’re stressed out or jittery, or paranoid.”

A number of participants described poor functioning in order to illustrate adequate functioning:

“I think of a person who is just kind of in their room all the time and they just keep to themselves. It’s not because they aren’t capable of going out, going to school and hanging out with their friends, but they just don’t want to do that, they don’t feel like they can do that, or feel able to do that. They just stay in their room and keep to themselves and don’t go to classes or don’t hang out with their friends.”

The second component of intrapersonal functioning which participants described included behaviors which promote subjective well-being. Behaviors which were identified that promoted subjective well-being were, having hobbies and interests outside of school and work and performing daily living activities, such cleaning the house, managing money, eating well, personal hygiene and taking medication regularly. One participant described how such activities promote emotional well-being:

“...volunteering and just giving back it makes you feel better as a person. You know just helping out. You know opening a door for someone, little things not just going to a hospital and volunteering everyday, just everyday little things are better.”

Interpersonal functioning was described as consisting of a relational component and a socialization component. For the relational component of intrapersonal relationships participants described similar activities for both family and peer relationships. Participants described the relational aspects of interpersonal relationships as staying connected with

family and friends, communicating regularly, spending time with them and being there for them when they need help. As one participant described:

“As a family member and as a friend someone who is functioning well you know I personally think should maintain contact with the family, should be aware of what is going on. Not just call every week and say okay so what happened. There should be a constant update and I think that’s good functioning.”

The socialization component of interpersonal functioning was described by participants as the beliefs, values and expectations that a young person’s family teaches and communicates to them. Participants also described that their friends are an important influence on their beliefs and decision-making process, such that a young person belongs to a peer group with particular social norms, which influence how the young person engages in the world.

Social role performance consisted of how well a young person performed at school and at work. Participants identified being a good student as a key social role of late-adolescents. Specifically, participants indicated that being a good student meant that an individual completes their work and put in time and effort into their studies. Interestingly, participants indicated that being a good student does not necessitate good grades, but rather doing the best one can given their ability level:

“I think based off that someone in my similar situation would be getting the best grades that they can do. Not necessarily what is required. What someone is requiring of them. Buts like you know if they study hard, they put in the time they put in the effort. You know that would be a good thing. They would be functioning well.”

The second social role identified as important for a late-adolescent to be perform well is being an employee. A good employee was described by participants as someone who shows up for work, is productive and is responsible:

“As a good employee they are showing up for their scheduled work shifts on time, they are being responsible, and completing work and being productive while they are working.”

Participants noted that being a good employee was less important than being a good student because the types of jobs late-adolescents hold tend to require little specialized skill.

In addition to being asked to define adequate functioning for a person their age, participants were asked to describe how alcohol affects a young person’s functioning. Overall participants indicated that alcohol use does negatively impact the three domains of intrapersonal functioning, interpersonal functioning and social role performance. With regards to intrapersonal functioning, alcohol was described as having a negative impact on emotional stability and the exacerbation of psychiatric symptoms. Additionally, alcohol was described to impact the loss of behavioral, emotional and cognitive control. In addition, participants described that alcohol would affect the degree to which a young person engages in activities that promote well-being. Specially, participants noted that daily living tasks would be less of a priority. Additionally, alcohol use impacts participation in activities outside of school, as alcohol use takes time and planning. As one participant noted there is a “loss of hobbies” and alcohol becomes “their new hobby.”

With regard to interpersonal functioning alcohol use is a shared interest among friends and is used to classify friends as drinkers or nondrinkers. Participants described that alcohol use facilitates a re-alignment of friendships and intimate relationships based on alcohol use, particularly if the friend does not drink. Participants believed that alcohol use can create interpersonal problems, in which the individual using alcohol fails to meet the relational demands of the interpersonal relationships, such as being there for the other

individual and behaving in a negative manner towards a friend. The impact of alcohol use on family relationships depended on what messages the participant's parents provided them about alcohol use. Participants noted that either their parents had taught them that alcohol use was a negative behavior which should be avoided, while other's noted that their parent were accepting of their alcohol use, as long as it is done in a safe manner.

Participants noted that social role performance in school and work would also be negatively impacted by alcohol use. Specifically, the quality of the individual's school work would suffer, as their alcohol use may interfere with the time they would spend studying and attending class. Additional behavioral markers identified by participants as indicators of poor school performance related to alcohol use included failure to complete their homework and poor grades:

“[O]ne of my roommates he drank too much during the week and I mean that's pretty much the cause and kind blew off some classes and when it came down to it he failed most of them so he has to transfer this year.

With regard to employment participants indicated that while alcohol use may impact an individual's performance at work, such as going to work with a hangover or intoxicated from the night before. However participants believed that while these behaviors are not an indicator of a good employee, they were relatively minor problems as the type of employment that people their age have requires little skill. One participants described his/her experience as a high school student working at a fast-food restaurant:

“I used to work at [a fast-food restaurant], and we would be a lot of people, mostly high school students that would work a night shift and then would have to come in for an 11:00-5:00 shift and they weren't able to make it to the shift because they were out partying the night before. It was really bad with high school students. It felt like it gave all of us a bad name because we were in the category because we were the same age so all high school students were like that.”

When describing how alcohol affects an adolescents functioning, participants described a set of behaviors which were unique to the use of alcohol and were linked to poor functioning in the domains of intrapersonal functioning, interpersonal functioning and social role performance. This set of behaviors consists of alcohol use behavior (behavior organized around alcohol, decision-making related to alcohol use) and its consequences (legal involvement, physical effects of alcohol, violation of others rights). Specifically, this domain includes behavior organized around alcohol; decision-making related to alcohol use, legal involvement, violation of others rights and physical effects of alcohol.

Participants described spending time organizing and planning their alcohol use behavior. This included allocating time to drink alcohol; time spent hiding alcohol, obtaining alcohol, talking about alcohol, using alcohol and recovering from alcohol. Participants noted that the time spent planning and using alcohol occurs as a function of their inability to buy and drink alcohol legally and the perception that time spent planning and using alcohol is socially acceptable for people their age:

I planned when I was going to drink. Ya I have. I look forward to a weekend you know I say okay you know like especially during football season, [university] games, so they are going, okay they are in the tournament you know I can't wait for this weekend. Or even if we just have a party on the weekend you know its just going to be one and so you look forward to that."

"I spent time trying to get something to drink. Especially not having a legal ID it kind of takes a little bit longer especially freshmen year you know you have to wait for someone who does to get back."

Decision-making related to alcohol use is a set of behaviors described by participants which are related to how much and when participants choose to use alcohol. Participants commonly discussed poor decision-making related to how much they drank, that is drinking more than they should have, when the drink, during the day, before social events or going to the bars. Interestingly, due in part to the common practice of planning their drinking participants indicated that they never drink longer than they intended, because when they choose to drink they intend to do so for a planned set of time. As one participant noted about their alcohol use:

“Like I drank more than I intended or longer than I intended. I never go out and say I am going to have this much. Sometimes I drank more than I should have but it is not more than I intended.”

One of the most salient consequences of using alcohol discussed by participants is legal involvement. The legal consequences related to alcohol use include obtaining and using a fake identification card, getting an underage drinking ticket from the police and being cited for drinking while under the influence (DUI).

“I was ticketed for underage drinking in [a state] which I haven’t really paid yet. I think I have a warrant for my arrest in that state.

The physical effects of alcohol use refer to the acute biological affects of alcohol intoxication and the time to recover from alcohol use. One participant described two physical effects they had experienced in the past:

“I had morning tremors. That did happen to me once, I had a really bad night before and I woke up shaking. I vomited. Um, yes that happened to me. It was the...the last day of finals and we went to a party and I actually thought that I was fine, but then I wasn’t and then we got back to the dorms and then I threw up.”

Overall, participants described an acceptable level of functioning for adolescents who use alcohol; such that on a global level they are functioning well in intrapersonally,

interpersonally and adequately performing social roles. However this global level of functioning is punctuated by periods of time when they experience poor functioning in particular domains of life related to their alcohol use behavior and consequence, particularly in the areas of social role performance, intrapersonally and interpersonally, which occur with periods of heavier drinking episodes. As one participant noted there is a fluctuation in alcohol use and its impact on functioning:

“Once my roommate went to the hospital he made a huge life adjustment, he stopped drinking for awhile. It gets expensive, it gets in the body sometimes, and I know a lot of people do a lot of stupid things, hurt themselves, lose friendships, girlfriends, that can really turn you off. Get in arguments with some people, random people, it can really trouble you, when you see them at school it makes it awkward. “

Two general conclusions can be drawn from the interview data. First, alcohol use does impact an adolescent’s functioning, specifically in the domains of intrapersonal functioning, interpersonal functioning and social role performance at school and work. Further, the impact of alcohol use on functioning fluctuates with the adolescents level of alcohol involvement, that is their alcohol use behavior and consequences, during a given time period. Second, the social context of the developmental period of adolescence needs to be considered in the development of alcohol behavior measures for this age group. These conclusions suggest that a measure which assess adolescent alcohol involvement should use a time frame should be relatively short in order to capture episodic fluctuations in alcohol use, its consequences and impact on functioning. In addition, we should expect fluctuations of reported alcohol use behavior, its consequences and impact on level of functioning, over repeated measurement as a functioning of alcohol use.

Further the interview data suggest that it is not sufficient to measure one component of an adolescent's involvement with alcohol, such as alcohol use behavior or level of functioning. Rather, it appears that taking a broader approach, in which the biological, psychological and social aspects of alcohol use are accounted for in a measure may provide a more valid and useful manner in which to capture an adolescent's involvement with alcohol. The proposed Relationships with Alcohol Scale for Late Adolescents is a biopsychosocial measure of a late-adolescents involvement with alcohol in the areas of intrapersonal functioning, interpersonal functioning, social role performance and alcohol use behavior and consequences. Items for the four domains were developed from a review of the adult and adolescent alcohol use literature. Items were further refined through the interview study through a cognitive interviewing procedure, in which participants reviewed and discussed the meaning of each item. Items which identified as confusing, unclear or inappropriate were removed or re-written. Items were added based on the data obtained from the interview study to better capture the four domains of alcohol involvement identified by the study participants. Overall, the interview study indicated that the original items, with a few exceptions, are appropriate for use with late-adolescents. As one participant noted about the item list:

“I think it's a good list. I think even though a lot of it doesn't pertain to me necessarily it spans the whole spectrum of possibilities. From light hearted drinking to full blown use of alcohol.”

The Relationship with Alcohol Scale for Late-Adolescents

Based on the review of the adolescent alcohol use and level of functioning literature and the data obtained from the previously discussed qualitative study (Lucey, 2009) a measured entitled 203 items were developed and categorized into 11 content

domains based on similarities in item content. The working title of the measure is The
The Relationship with Alcohol Scale for Late-Adolescents

The RAS is a biopsychosocial measure of the impact of a late-adolescent's alcohol use on functioning. The RAS will attempt to be developmentally selective by targeting item content to behaviors relevant to late-adolescents with the hope of improving the validity of the measure. The 11 hypothesized developmentally salient domains of the RAS are: 1) Psychological/Emotional Well-Being, 2) Behavior Promoting Well-Being, 3) Interpersonal Functioning, 4) Behaviors Organized Around Alcohol Use, 5) Decision-Making Related to Alcohol Use, 6) Physical Affects of Alcohol Use, 7) Legal Problems, 8) School Performance, 9) Work Performance and 10) Violation of Other's Rights. The purpose of the current studies is to determine the content domains, content definitions and item-relevance of the RAS.

CHAPTER III METHOD

The following section provides information regarding the research design, participants, recruitment, materials and procedures for Studies I and II.

Research Design

Studies I and II are psychometric studies utilizing content validation methods and procedures to develop the content domains, domain definitions and item relevance. The two studies were designed as two separate, yet sequentially tied procedures. Study I utilizes a simple sorting task and multidimensional scaling to determine the content domains of the Relationship with Alcohol Scale. The items in the identified content domains were reviewed and domain definitions were developed based on item content. The content domains and domain definitions were used in Study II. Study II used Q-sort methodology to obtain item-relevance ratings for each item within each content domain. Item-relevance indexes were calculated in order to identify the most relevant items within each content domain.

Participants

Study I

A sample of 20 adolescents (13 female, 7 male), 16-20 years of age ($M= 17.47$, $SD= 1.3$), participated in Study I. The majority of the sample identified as European-American (60%), 25% identified as multiracial, 5% identified as African-American, 5% identified as Latino/a and 5% identified as Native American.

Study II

A sample of 50 (30 female, 20 male), ages 16-20 ($M= 18.24$ year, $SD= 1.39$) participated in Study II. The sample was 48% European-American, 24.5% Latino/a, 16% African-American, 6% Multiracial and 4% Asian-American.

Recruitment

For both Studies I and II participants were recruited from Tenor High School and Marquette University using the same recruitment procedures. Study II required a larger number of participants as compared to Study I, therefore recruitment of potential participants was also conducted in the Milwaukee community for Study II only.

Tenor High School

Tenor High School was selected for recruitment because of the administration's commitment to research participation. The school principal and assistant principal identified students for participation. Identified students were provided with a packet providing a flyer describing the study, a letter to the parent or guardian of the student explaining the study and a parent permission form. Students were instructed to return the signed parent permission forms within a week of distribution if they were interested in participating in the study. The school principal and assistant principal collected the permission forms. After the deadline for the permission forms had passed, the first 10 students who returned their permission forms were scheduled for a meeting with the researcher to complete the study. During the scheduled meeting time, the student's assent for participation in the study was obtained.

Marquette University

Flyers advertising the study were placed across campus to identify potential participants. The flyers directed potential participants to call the researcher to learn more

about the study and schedule an appointment for study participation. Informed consent for study participation was obtained at the beginning of the scheduled meeting.

Community

Flyers advertising the study and direct person-to-person solicitation were used to recruit participants in the Milwaukee community. Flyers were handed out to potential participants in local shopping malls which stated that individuals between the ages of 18 and 20 could earn ten-dollars for an hour of participation in a card sorting study on alcohol use. As the recruitment flyers were being handed out, the researcher asked passing individuals if they were between the ages of 18 and 20 and would they like to hear about a study where they could earn ten-dollars for an hour of their time. Individuals who expressed interest in learning more about the study were provided with a description of the study and were asked if they would like to schedule an appointment with the researcher to participate in the study. Potential participants who were interested in participating in the study were scheduled for an appointment to participate in the study.

Materials

Study I

Stimulus Cards. The stimulus for the simple sorting task consisted of 192 item statements developed to capture the impact of alcohol use on functioning (Appendix A). Item statements were developed from a review of the adult and adolescent alcohol use literature and interviews with late-adolescents (Lucey, 2009). Item statements were printed on standard note cards. Each stimulus card had a number on the card for identification and coding purposes. One item statement was printed on each card, for a total of 208 stimulus cards.

Background Information Form. Demographic information was gathered through a Background Information Form developed by the author. Information gathered by this form included the age of participant, their gender and racial/ethnic background (Appendix B).

Study II

Q-Sample. The Q-sample consisted of 192 item statements developed from a review of the adult and adolescent alcohol use literature and interviews with late-adolescents (Lucey, 2009). Item statements were conceptually organized into 6 domains affected by alcohol use based on the MDS analysis conducted in Study I (Appendix C). A domain definition was developed based on a content analysis of the items contained within each content domain. See Appendix C for the domain definitions.

Each item statement was printed on a standard note card with a corresponding identification number printed on the card in order for later recording of the Q-sort results on a scoring sheet.

Scoring Sheet. A scoring sheet was used to record the results from the Q-sort onto paper for later data entry and analysis. The scoring sheet was designed to represent the Q-sort distribution presented to the participant (Appendix D), with corresponding scores for each distribution marker where the participant placed the item cards.

Background Information Form. Demographic information was gathered through a Background Information Form developed for this study. Information gathered by this form include\ the age of the participant, their gender and racial/ethnic background (Appendix B).

Procedure

Study I

Participants were greeted and invited by the researcher to be seated at a conference table. The researcher reviewed the informed consent (if participant was 18 years of age or older) or assent (if participant was under the age of 18) with each participant.

Participants were provided with the Background Information Form to fill out. After completion of the Background Information Form the subject was presented with the set of 208 stimulus cards. Participants were instructed to complete a simple sorting task (Takane, 2007). in which participants were instructed to organize the stimulus cards into piles that represent the areas of a young person's life that are affected by alcohol use. Participants were informed that there were no right or wrong answers and that they could make as many piles as they wanted.

When participants were finished sorting the cards into piles, the author asked the participant to explain what are of life the pile represented. The author recorded the participants' responses. At the completion of the session, participants received \$10.00 in cash for participation.

Study II

Participants were seated at a table. On the table a Q-sort continuum was laid out on the table top. The Q-sort continuum consisted of 11 distribution markers representing a rank-order continuum from left (-5) to right (+5), with the middle marker demarking the zero point. Participants were informed that the left side of the Q-sort continuum (-5) represents "not very important" and the right (+5) represents "very important". The middle zero-point on the continuum was described to the participants as a neural point,

where they were to place items they were unsure or ambivalent about (Appendix E; McKeown & Thomas, 1988).

Participants were presented with one set of item cards at a time. The researcher read out loud the name of the content domain and definition, represented by the set of cards. Participants were instructed to sort the item cards based on how important the item statement was for describing the domain definition. The domain name and definition was placed on the tabletop above the Q-sort continuum for the participant's reference during the sorting task.

Participants were instructed to read through the cards in order to familiarize themselves with the item statements in the set and sort the cards into three general piles: a pile of items that are generally the least important, a pile of statements that are generally the most important and a pile of items that are neutral. Participants were instructed to place the pile of least important items on the left side of the continuum, the pile of most important items on the right of the continuum and the neutral pile at the mid-point of the continuum.

Participants were then instructed to turn to the pile of items on the right side of the continuum (pile representing "very important" item statements). Participants were asked to read through the cards and identify the items in the pile which were the most important items defining the domain definition. The participant is told to place these items under the +5 maker.

Participants were then instructed to turn their attention to the left side of the continuum ("not very important") and to select the items from the pile that were the least

important items for describing the domain definition. Participants were instructed to place these items under the -5 marker.

The participant was then instructed to return to the pile of items on the right side and identify the items which were a little less important than the most important items under the +5 marker. Participants were instructed to place these items under the +4 marker. This process was repeated with the left side of the continuum.

This process was repeated with the subsequent distribution markers, with the participant working first with the right side of the distribution and then the left, moving down the continuum towards the middle. The use of this process facilitated comparison between items and judgments of importance and unimportance (McKeown & Thomas, 1988).

After the participant had completed ranking all of the items in the set, they were instructed to start at the -5 marker and read the item numbers aloud for each distribution marker. The researcher copied the item numbers under the corresponding continuum marker of the scoring sheet.

CHAPTER IV RESULTS

Study I

Multidimensional Scaling and Cluster Analysis

A multidimensional scaling (MDS) procedure, followed by a hierarchical cluster analysis, was used to analyze and interpret the sorting data from Study I. MDS procedures are used to determine the proximity between pairs of items to derive the underlying dimensions of a measure. MDS uses measures of similarity/dissimilarity between pairs of item statements to derive the dimensionality in a dataset (Schiffman, Reynolds & Young, 1981). After obtaining the MDS configuration, cluster analysis was used to aid in the interpretation of the dimensions obtained from the MDS procedure (Kruskal & Wish, 1978; Sireci & Geisinger, 1992).

The sorting data obtained from participants was transformed into a dissimilarities matrix. The dissimilarities matrix was applied to a multidimensional scaling analysis.

The MDS analysis creates a configuration matrix, using the configuration coordinates of item statements. The configuration coordinates and configuration plots are then visually inspected in order to interpret the meaning of each dimension represented in the configuration matrix. The configuration coordinates are then used in a hierarchical cluster analysis to aid in the interpretation of the dimensions obtained from the MDS analysis.

The use of cluster analysis in the interpretation of a MDS configuration is called a “neighborhood interpretation of an MDS configuration” (Kruskal & Wish, 1978, p. 43).

In the neighborhood interpretation method, neighborhoods or regions of the dimensional

space are thought to have meaning based on some shared characteristic of the stimuli. In Study I, participants sorted items into groups that represented different areas of life affected by alcohol use, such that the items in each pile shared characteristics of a domain of life. Using the neighborhood interpretation of the MDS configuration, items which share characteristics of an area of life will be closer to each other in the MDS space than those items which do not share these characteristics. Hierarchical cluster analysis is used to aid in the interpretation of these regions of the MDS space, by providing information on which items clustered together based on the configuration coordinates and matching this information to the MDS configuration matrix.

Selection of Dimensionality

There are two criteria used to determine the appropriate dimensional configuration of the data: goodness-of-fit and interpretability. Ideally, both fit and interpretation of the dimensional configuration are maximized, however this is not always possible, as often higher-order solutions have the best fit, but are difficult to interpret (Kruskal & Wish, 1978; Sireci & Gelsinger, 1992; Borg & Groenen, 2010).

Table 4.1 presents the fit indices of STRESS for one- through twelve-dimension solutions for the data. Inspection of the STRESS indices indicates that a 12-dimension solution appears to provide the best fit for the data with a satisfactory goodness-of-fit statistic (STRESS= .05). Table 4.2 provides the configuration coordinates for the 12-dimension solution.

While the 12-dimension MDS solution has a satisfactory goodness-of-fit statistic, this criterion alone is not sufficient to determine dimensionality. Further analysis of the

Table 4.1
STRESS Indices for 1- through 12-Dimension Solutions

Dimension	STRESS
1	.52
2	.33
3	.23
4	.18
5	.14
6	.12
7	.10
8	.08
9	.07
10	.06
11	.06
12	.05

configuration coordinates is necessary in order to determine if each of the 12-dimensions are interpretable. This second step in the selection of dimensionality is accomplished through two steps. First, the MDS configuration coordinates are visually inspected to identify items which share proximity in the multidimensional space and determine if these items share a common characteristic through inspection of the item content. Second, the MDS configuration coordinates are subjected to a hierarchical cluster analysis in order to provide validation of the visual inspection of the MDS configuration coordinates.

Visual inspection of the 12-dimensional coordinates (Table 4.2) indicates that Dimensions 1-6 are readily interpretable, as evidenced by item groupings within the dimensional space which share a common characteristic. The cluster analysis performed on the 12-dimensional coordinates revealed 8 item clusters. The first 6 item clusters correspond with Dimensions 1-6 of the 12-dimension solution. The correspondence

between Dimensions 1-6 and 6 of the item clusters provides further evidence for the interpretability of Dimensions 1-6. The cluster analysis identified 2 additional item clusters which did not correspond with any of the dimensions in the 12-dimension solution. Comparison of these two item clusters with the 12-dimension solution indicates that the items in these two clusters were grouped into Dimensions 2 and 6 of the MDS solution. Kruskal and Wish (1978) noted the failure of a MDS solution to identify a dimension may be due to the correlation between the unidentified dimension and other dimensions in the MDS solution.

The configuration coordinates for Dimensions 7-12 do not appear to be interpretable. Based on visual inspection of Dimensions 7-12 no clear item grouping within these dimensions can be observed. In fact, items which share close proximity within these dimensions do not appear to share a common characteristic, thus making Dimensions 7-12 not interpretable.

Table 4.2
Configuration Coordinates for the 12-Dimension MDS Solution

Item	Dimension											
	1	2	3	4	5	6	7	8	9	10	11	12
1	1.50	-5.39	5.25	-0.36	4.46	1.79	0.41	3.58	-3.24	-5.70	-1.67	2.92
2	5.57	6.53	6.79	3.23	2.17	0.79	-0.41	0.32	-2.53	0.02	-1.07	-1.03
3	4.82	0.33	7.73	2.11	-2.53	1.73	0.79	-2.57	-0.51	-1.35	1.33	5.16
4	4.01	-2.06	9.18	0.06	-3.12	2.31	1.45	-0.22	2.22	-1.80	-0.62	3.23
5	4.84	4.38	2.79	7.75	1.51	-5.53	-0.17	-1.58	2.73	-1.33	0.40	-0.88
6	5.17	7.48	6.96	4.64	1.11	1.73	-1.09	0.04	0.21	-0.88	-0.51	0.65
7	4.47	4.13	2.00	7.73	2.10	-6.45	-0.38	-1.57	2.82	-1.39	0.38	-0.89
8	4.47	4.13	2.00	7.73	2.10	-6.45	-0.38	-1.57	2.82	-1.39	0.38	-0.89
9	4.70	4.18	5.56	5.88	3.97	-5.47	1.24	0.66	-0.63	0.11	-0.47	-2.21
10	1.70	6.36	8.28	5.33	-1.49	3.09	-0.84	1.33	0.94	-0.48	-2.83	1.20
11	5.17	7.48	6.96	4.64	1.11	1.73	-1.09	0.04	0.21	-0.88	-0.51	0.65
12	5.57	6.97	6.98	2.06	2.43	1.26	-0.26	0.65	-1.33	0.79	-0.59	-1.80
13	4.28	5.19	4.78	-0.39	1.63	5.76	-1.89	2.69	0.45	-0.79	1.21	-4.74
14	4.62	6.53	5.14	0.79	1.05	2.86	-1.18	4.58	-2.42	1.74	0.28	-2.22
15	4.58	8.50	4.48	2.55	-2.13	3.24	0.06	0.18	-0.46	0.12	2.50	0.57
16	5.13	2.47	6.48	3.29	-6.08	-0.95	1.98	0.78	1.02	0.63	1.31	4.22
17	-9.72	4.24	1.52	3.86	1.65	3.47	0.41	-1.11	-1.91	0.75	-0.25	-1.97
18	2.22	4.61	3.06	-6.67	-1.31	3.29	3.13	2.08	-0.55	-1.14	0.70	-5.75
19	1.98	3.63	3.86	-0.87	0.91	4.69	-1.07	4.63	-5.55	-2.01	2.15	-4.61
21	4.56	3.09	4.63	2.61	-4.08	2.41	-2.12	-2.53	0.54	-2.48	-4.79	-4.08
22	4.46	8.97	4.01	2.30	-1.85	1.07	-2.22	0.60	-2.12	-1.46	-0.98	-0.80
23	5.12	7.69	6.14	4.66	-0.13	0.90	-0.38	-1.84	-1.95	-1.60	-0.63	0.46
24	5.05	7.58	6.30	4.61	0.59	1.03	-1.14	-0.79	-1.60	-0.89	-1.88	0.85
25	5.10	7.54	6.98	4.51	0.62	1.73	-0.89	-0.00	-0.20	-0.59	-0.60	0.71
26	-1.50	6.90	1.77	-0.07	-0.81	2.31	-0.56	-0.81	0.64	5.83	-0.51	5.82
27	4.18	4.03	4.32	2.14	-0.82	1.38	-2.76	1.83	-4.65	4.30	2.46	-0.90
28	3.27	-3.84	7.69	-0.44	0.28	4.82	-1.67	-0.92	-3.76	-0.88	3.17	-0.69
29	4.82	5.69	5.48	0.75	2.54	3.41	-1.35	4.50	-2.65	0.39	0.26	-0.24
30	-0.40	6.19	3.16	2.01	1.68	1.96	-0.40	3.39	-2.33	6.17	2.14	2.48
31	1.93	-1.36	3.86	1.76	2.14	2.44	4.95	2.32	0.51	-0.16	1.71	-8.30
32	1.53	-4.29	-0.02	0.30	-0.95	-0.43	7.15	0.61	-6.48	3.36	0.70	-0.47
33	-3.25	-2.89	0.43	-2.72	1.52	-0.62	3.21	-1.94	-5.03	5.12	3.77	3.86
34	1.52	3.57	0.45	6.38	2.04	-7.60	2.16	0.62	2.56	-0.94	0.03	-5.86
36	-1.51	-0.98	-0.84	-5.07	-3.00	1.48	-5.29	4.54	-1.03	-0.80	7.35	-2.87
37	4.58	-5.05	-3.70	0.79	6.23	1.03	2.18	0.17	0.30	-0.07	1.57	6.25
38	0.41	-0.24	-7.47	-0.27	-1.00	-0.94	-1.74	7.28	-1.47	-1.38	4.47	1.79
39	0.95	6.54	-2.91	-5.16	1.42	-0.02	4.83	-2.43	2.90	-2.61	-1.44	3.99
40	2.37	5.94	1.04	-7.49	0.65	2.15	2.83	-2.48	4.26	-2.72	-3.13	2.55
41	1.90	5.09	-1.97	-7.75	4.28	-0.18	1.61	-1.45	-1.67	3.63	-4.24	2.87
42	0.60	4.52	-1.87	-7.35	4.38	0.32	1.27	-0.68	-1.98	4.74	-4.34	3.29
43	0.73	4.88	-1.97	-7.56	4.33	0.21	1.64	-1.16	-1.66	4.07	-4.21	3.06
44	-0.43	5.14	-3.44	-6.87	0.37	-1.96	5.02	1.32	-2.88	1.85	1.99	-1.40
45	-2.33	-0.35	-0.69	-8.53	4.44	3.99	-1.70	0.89	-0.98	5.40	-0.46	1.19
46	-3.29	2.92	-2.59	-2.56	-2.59	-1.19	-4.29	1.77	-1.36	-0.83	7.58	5.31
47	-1.80	-2.58	-2.27	-2.97	-0.32	2.93	-3.56	3.69	-0.41	-0.89	8.97	1.77
48	0.71	4.85	-1.91	-6.90	5.07	-0.49	1.78	-1.00	-1.44	4.53	-4.11	2.98
49	-0.74	1.82	-1.80	-7.26	5.35	0.86	-2.75	-0.37	-1.77	6.18	-1.50	3.20
53	-1.24	-5.29	2.61	-4.91	3.76	-0.40	-5.76	2.31	1.84	-5.61	3.60	-1.59
56	-3.67	1.70	0.28	3.95	7.11	-9.59	-0.41	1.86	3.43	0.80	-0.06	-0.44
57	-2.66	0.84	0.55	3.05	6.21	-11.18	-1.84	0.66	2.60	1.08	0.18	-0.93
58	2.15	-8.88	4.35	-1.75	-1.64	0.73	0.99	-1.14	0.33	4.16	0.60	1.09
59	2.65	-6.22	-0.65	0.41	3.73	-1.23	3.19	2.28	-4.44	-4.24	-2.24	4.61
60	2.74	-7.71	3.92	0.09	-5.59	0.14	0.59	-0.89	-0.90	3.36	-0.52	-0.61
61	0.23	-5.86	4.06	-3.85	3.60	1.71	-4.39	-1.07	6.48	-4.02	-0.61	2.69
62	-0.49	-4.84	1.88	-5.91	6.02	2.76	-3.55	2.84	3.42	-1.34	2.27	0.07
63	3.05	-8.04	3.96	-0.90	2.37	2.78	1.95	-0.47	1.35	0.94	3.32	2.79

Cont. Configuration Coordinates for the 12-Dimension MDS Solution

Item	Dimension											
	1	2	3	4	5	6	7	8	9	10	11	12
64	3.14	-6.81	1.14	0.47	2.80	-0.19	1.93	-2.47	0.25	4.89	2.15	4.82
65	3.68	-7.84	-0.34	1.01	1.18	-0.51	1.81	-3.57	-0.02	2.65	3.11	2.81
66	2.76	-1.83	-1.43	2.85	6.73	-9.56	1.63	2.39	-1.62	-0.93	1.54	1.28
67	3.37	-2.13	-0.84	5.55	3.50	-8.12	1.34	-1.22	0.75	3.80	1.24	-1.96
68	3.16	-5.55	5.69	1.43	-5.76	1.34	-0.38	-1.56	2.76	1.34	0.26	2.45
69	2.94	-6.46	5.57	-0.54	-5.29	0.18	0.47	-0.40	-0.56	3.89	-0.40	-0.34
70	2.75	-6.86	5.19	-0.73	-5.66	-0.47	0.12	0.00	-0.17	3.49	-0.20	-0.15
71	3.30	-7.27	5.83	0.27	-3.40	0.35	0.95	0.51	0.73	3.02	0.28	-0.98
72	1.50	-6.28	4.70	-4.17	5.37	-0.12	-2.94	2.86	4.44	-1.04	-2.51	-2.20
73	1.84	-1.40	0.68	0.26	8.74	-7.91	-1.98	2.51	3.92	0.82	0.96	-2.71
74	-1.77	-6.18	3.16	-5.35	5.40	1.39	-4.00	1.64	1.97	-3.63	1.29	-0.06
75	3.54	-6.33	2.92	0.70	-0.18	1.22	5.88	0.73	2.65	0.08	4.01	-2.80
77	-9.82	-2.19	4.71	1.81	0.95	-0.15	-1.66	-5.83	0.05	-0.10	-0.75	-1.24
78	3.56	-7.29	-2.32	3.36	-0.01	0.85	3.38	-3.72	4.82	-0.90	-1.42	3.14
79	2.87	-2.08	-0.96	3.12	6.09	-8.79	1.75	1.54	2.12	3.10	3.45	-0.93
80	0.44	-6.91	4.06	-5.56	5.71	1.09	-3.70	0.21	3.49	-2.38	0.45	-0.33
81	3.19	-6.64	0.74	2.30	-1.03	2.60	4.42	-1.60	5.72	-3.27	-0.20	1.49
82	0.59	-7.06	3.67	-4.67	5.60	1.24	-4.41	0.59	3.76	-2.84	0.14	-1.02
83	-2.26	-6.99	1.18	-2.80	-0.86	1.25	2.00	-1.17	-2.06	0.85	6.42	1.24
85	3.55	-8.07	-3.02	1.58	1.39	1.92	5.77	0.48	3.35	1.03	0.64	0.94
86	3.57	-8.11	-2.97	1.77	1.28	1.81	5.67	-0.02	3.31	1.37	0.15	1.07
87	1.95	-6.11	2.02	-3.54	7.01	2.27	-0.71	1.99	5.20	-4.44	2.94	-2.49
88	3.28	-6.59	-2.19	1.56	0.13	1.16	-1.51	-0.17	1.40	4.02	-7.40	-0.16
89	2.24	-4.80	-1.79	-2.03	-0.94	-1.40	1.92	1.57	-4.76	-7.28	-4.35	-2.14
90	2.45	-7.37	0.30	0.03	0.12	-0.35	3.15	2.18	-4.36	-6.04	-3.32	-0.66
91	2.17	-3.12	3.80	2.49	-2.66	1.71	1.55	-2.70	-2.83	1.97	1.50	7.46
92	1.23	-7.81	0.68	-0.55	-4.01	-0.40	-0.61	-1.88	0.68	1.19	5.51	-2.67
94	1.13	-6.39	0.41	-0.43	3.85	-1.21	0.10	0.57	-5.70	-3.64	-0.40	5.05
95	3.81	-6.87	-1.82	2.61	0.71	-0.54	5.26	-1.86	0.56	2.93	-1.03	2.54
96	2.82	-7.20	-0.63	0.53	-0.23	2.10	7.62	-2.02	-2.11	0.27	-0.72	-2.30
97	1.04	-6.04	1.68	-4.06	6.90	1.08	-4.61	1.65	4.90	-1.83	-3.60	-1.31
98	4.05	-7.82	0.41	1.09	0.12	1.86	5.58	4.00	0.98	1.17	2.18	1.28
99	2.25	-7.71	0.10	-0.79	1.43	0.41	3.58	3.13	-3.72	-5.28	-2.01	3.43
100	-11.07	2.53	-1.31	1.76	0.08	1.40	2.87	3.58	1.40	-0.08	-0.61	0.67
101	-11.07	2.53	-1.31	1.76	0.08	1.40	2.87	3.58	1.39	-0.08	-0.61	0.67
102	-11.07	2.53	-1.31	1.76	0.08	1.40	2.87	3.58	1.40	-0.08	-0.61	0.67
103	-10.73	2.98	-0.77	2.09	0.20	1.81	3.08	3.54	0.89	-0.30	-0.41	0.50
104	-11.07	2.53	-1.31	1.76	0.08	1.40	2.87	3.58	1.40	-0.08	-0.61	0.67
105	-11.71	2.22	-0.23	1.22	0.12	1.24	1.15	2.38	1.22	0.59	0.42	1.12
106	-7.81	-0.69	3.86	2.27	0.41	-0.77	1.65	3.52	3.62	2.92	-1.32	5.31
107	-10.95	2.30	-1.12	1.76	-0.54	0.88	2.57	4.19	1.82	0.10	-1.80	0.64
108	-11.06	2.53	-1.31	1.78	0.08	1.38	2.88	3.58	1.40	-0.06	-0.61	0.65
109	-9.99	3.40	-1.25	2.21	-0.68	1.61	3.03	3.70	3.13	-0.31	-1.29	2.10
110	-11.46	2.33	-0.41	1.29	0.04	1.32	1.70	3.15	1.47	0.50	0.26	1.17
111	-11.46	2.33	-0.41	1.29	0.04	1.32	1.70	3.15	1.47	0.50	0.26	1.17
112	-10.24	2.61	-1.61	1.74	-0.83	0.77	2.92	5.76	1.40	-1.34	0.11	0.25
113	-10.76	3.74	0.11	1.18	-0.22	0.95	2.32	4.29	2.09	-0.68	-0.56	0.87
114	-10.00	1.59	-1.10	1.28	-0.73	1.62	2.96	5.20	2.45	-1.21	-0.51	0.34
115	-10.47	2.09	-2.05	2.42	-0.80	1.08	3.22	2.79	1.82	0.86	-0.90	-0.41
116	-9.83	1.44	-2.79	3.21	-0.91	1.09	3.44	3.09	1.95	-0.25	-1.63	-0.25
117	-10.39	-1.93	2.52	0.22	1.26	-0.00	-1.21	-3.82	-3.01	0.56	0.64	-1.62
118	-10.83	-1.67	3.01	0.24	-0.03	-1.00	-2.60	-4.98	-1.51	-0.30	-1.22	-0.82
119	-11.09	-0.99	2.56	0.49	0.04	-0.60	-1.62	-4.78	-2.12	-0.81	0.32	-1.04
120	-10.97	-1.24	2.22	1.47	0.25	0.16	-2.13	-4.82	-1.29	-0.94	1.08	-1.27
121	-11.50	-1.05	2.46	0.94	0.36	-0.20	-0.90	-4.23	-1.65	-0.68	0.43	-0.67
122	-11.42	-1.01	2.45	1.06	0.40	-0.15	-1.35	-4.42	-1.48	-0.46	0.17	-0.85
123	-10.45	-2.22	3.91	1.07	1.43	-0.27	-0.98	-5.78	0.50	0.35	-0.73	-0.92

Cont. Configuration Coordinates for the 12-Dimension MDS Solution

Item	Dimension											
	1	2	3	4	5	6	7	8	9	10	11	12
124	-10.73	0.29	0.05	1.35	0.14	0.26	-2.11	-5.34	-1.70	-1.56	0.53	-0.94
125	-11.42	-1.01	2.45	1.06	0.40	-0.15	-1.35	-4.42	-1.48	-0.46	0.17	-0.85
126	-11.07	-1.15	2.21	1.01	0.27	-0.33	-1.54	-5.25	-1.80	-1.01	0.16	-0.84
127	-11.09	0.71	0.81	1.06	0.20	0.63	-2.38	-4.47	-1.16	-0.61	1.42	-1.33
128	-11.25	-1.39	2.88	0.97	-0.29	-0.84	-2.07	-4.45	-1.21	-0.31	-0.91	-1.07
129	-10.73	-1.56	2.62	0.81	-0.79	-1.39	-2.73	-5.17	-1.23	-1.05	-1.76	-1.02
130	-10.47	-0.95	0.86	1.73	1.16	0.25	0.82	-5.74	-2.34	-1.40	-2.15	-2.31
131	-10.37	-2.13	1.53	1.76	-0.38	-0.50	-1.48	-5.46	-1.99	-2.45	-0.24	-1.03
132	2.84	0.32	-7.89	3.11	3.63	0.39	-2.13	-0.12	-4.92	-0.06	-0.34	-0.10
133	1.19	1.40	-7.68	1.59	-3.48	1.74	-3.09	-5.64	0.89	1.51	1.40	1.45
134	3.81	1.96	-7.27	5.13	-1.48	3.48	-2.13	0.13	0.33	1.18	-2.94	0.83
135	3.50	1.72	-6.92	4.94	-2.84	2.63	-2.24	0.77	0.29	0.85	-4.09	0.23
136	3.03	0.11	-4.62	2.92	-3.58	6.25	-4.64	-1.62	2.74	1.52	1.04	-1.48
137	2.21	-0.71	-6.61	-0.51	2.76	6.43	-4.96	1.66	0.25	-0.85	-1.76	-3.89
138	1.58	-1.33	-4.33	-1.86	2.82	6.22	-7.73	0.63	-0.46	2.76	-1.70	-1.15
139	1.60	-1.34	-4.41	-1.75	0.63	7.15	-7.30	0.70	-2.30	2.64	-0.70	-0.70
140	1.36	2.64	-8.29	2.63	-1.66	3.53	-3.13	1.81	-0.18	1.12	-3.72	2.11
141	1.57	1.45	-8.27	4.00	-2.74	-0.84	3.41	-2.00	-0.08	-1.10	3.49	1.54
144	2.14	0.03	-5.92	-0.25	3.81	3.54	-7.45	0.13	-1.86	2.41	-2.44	0.36
145	3.18	-3.67	-2.04	0.53	4.68	0.25	-7.48	1.21	-3.00	3.49	-3.20	-0.05
147	4.03	-0.43	-7.91	3.74	0.83	1.19	1.28	1.49	1.25	4.38	0.23	-1.18
148	2.37	3.09	-6.15	-0.09	3.34	2.65	-5.72	-0.49	1.23	-1.25	-5.68	4.26
149	3.03	-4.60	-3.29	-0.15	4.95	-2.52	-4.44	-2.56	1.98	-1.14	-5.30	-3.34
150	3.45	-5.21	-4.32	2.20	0.77	-1.51	-1.25	-0.99	-0.31	3.97	-6.90	1.16
151	1.99	-6.05	-2.69	-0.95	2.83	0.64	-5.49	1.22	3.81	-1.59	-5.60	-3.67
152	0.66	2.98	-7.98	-0.29	-0.91	2.73	-1.75	3.20	0.70	-1.32	5.35	4.35
153	2.55	1.49	-7.95	4.91	-1.19	1.76	1.21	-1.80	-1.89	-2.31	-1.69	0.44
154	2.55	1.57	-7.99	4.66	-2.75	0.81	1.52	-1.23	-2.05	-2.06	-0.58	0.97
155	0.76	-1.63	-5.49	-0.69	-4.95	0.95	1.02	-4.51	3.72	-4.12	3.70	0.47
156	2.22	-5.77	-5.17	2.21	-1.61	2.52	2.02	-2.76	-2.25	-2.40	1.40	-4.14
157	1.52	1.67	-9.01	2.08	-1.54	1.86	-0.87	-2.35	-0.20	-3.78	2.84	0.77
158	1.86	1.47	-9.33	2.96	-1.96	1.29	-0.38	-3.11	0.79	-1.48	1.59	-0.63
159	2.97	1.57	-8.97	1.95	1.42	1.79	-0.80	-3.37	1.61	-4.06	1.98	0.96
160	3.50	-0.74	-6.97	0.57	-1.16	-1.59	-2.14	-4.36	-2.75	0.81	4.37	-1.17
161	3.08	-7.62	-3.53	2.11	-2.59	0.17	3.69	-0.57	1.18	-1.02	-1.69	-3.67
162	4.45	1.26	-2.69	3.45	2.55	2.37	-3.41	-2.43	-2.95	1.60	5.86	0.05
163	3.01	-2.94	-6.77	2.10	-4.33	2.77	1.77	1.13	4.44	-2.34	-2.15	-0.51
164	3.17	0.58	-9.14	3.24	-3.15	-1.14	0.30	-1.60	1.86	-2.34	-1.55	-0.30
165	3.57	-0.46	-8.59	1.12	-1.78	-2.49	0.95	-1.02	-2.70	-1.56	-1.65	-2.29
166	2.71	0.78	-6.18	4.06	-1.92	1.74	-3.66	0.41	-2.08	3.46	-1.34	-4.23
167	3.69	5.89	-0.72	3.90	-2.11	0.01	-6.57	-1.33	3.22	1.22	-0.36	-0.23
168	3.04	2.85	-5.57	1.55	0.76	1.13	-4.70	-5.99	0.97	-4.00	2.89	1.21
169	-0.69	-5.84	0.40	1.22	-9.06	-1.87	1.29	3.41	1.48	0.12	-2.73	-0.35
170	0.56	-0.82	-0.60	-0.26	-7.05	-0.13	-0.58	4.93	-0.54	3.70	-3.20	-6.13
171	0.46	-6.00	4.35	-3.13	-6.99	-1.90	-1.23	0.75	0.03	2.47	-2.59	-1.00
172	1.32	-7.12	2.57	-1.67	-6.73	-3.16	-2.59	1.27	0.34	2.51	-0.90	-2.72
173	2.44	-3.89	0.94	-1.65	-4.95	-2.15	-1.11	-1.06	-2.35	-9.39	-2.91	0.27
174	2.53	-7.41	2.80	-0.06	-6.14	-1.13	1.33	1.83	0.16	2.51	-2.61	-2.35
175	2.10	-7.45	3.72	-1.35	-6.20	-1.70	-0.88	0.61	0.31	2.69	-1.61	-1.17
176	-1.14	1.21	-1.29	-2.96	-6.04	-7.37	-4.79	5.65	-1.27	-0.85	-1.71	2.28
177	-1.70	-0.38	-2.08	-2.05	-7.64	-5.57	-3.85	1.22	-1.34	3.22	0.30	3.08
178	-1.55	1.44	-0.70	-3.26	-6.64	-6.60	-5.46	3.46	-2.70	-0.92	-0.12	2.52
179	-1.71	-2.36	2.14	-3.81	-8.35	-4.13	-5.45	1.94	0.78	-3.06	0.09	2.73
180	-2.37	-2.97	1.94	-4.20	-7.60	-5.44	-5.25	3.90	-1.51	-2.13	-0.81	0.95
181	-1.55	1.44	-0.70	-3.26	-6.64	-6.60	-5.46	3.46	-2.70	-0.92	-0.12	2.52
182	-2.57	-0.36	-0.41	-2.41	-6.71	-7.09	-2.22	4.96	-3.75	-2.59	-0.21	2.25
183	2.14	-0.38	-7.13	1.52	-0.15	1.50	-0.41	3.54	-2.57	3.90	-4.56	-0.23

Cont. Configuration Coordinates for the 12-Dimension MDS Solution

Item	Dimension											
	1	2	3	4	5	6	7	8	9	10	11	12
184	1.13	3.72	-4.74	-5.12	-1.38	-1.99	5.78	-1.35	-0.85	0.31	1.91	-4.92
185	1.40	0.88	1.21	-4.02	3.75	-3.15	2.56	-2.50	-7.99	-5.52	-1.80	0.73
186	2.59	0.50	0.12	0.04	3.92	-3.14	1.41	0.16	-9.59	-4.60	-1.52	1.18
187	0.55	5.27	-0.12	-6.94	0.67	-2.12	2.02	-3.42	-1.90	3.21	5.40	-1.12
189	2.38	5.19	-3.49	-7.13	0.11	-2.97	4.66	-2.29	-0.87	-1.70	-0.27	-3.08
190	2.42	7.92	-1.75	-6.82	0.28	-1.98	2.86	-4.32	0.69	-1.25	-2.41	1.80
191	2.58	8.24	-1.61	-6.82	-0.27	-1.74	3.07	-4.05	0.86	-0.93	-1.15	0.89
193	2.75	6.23	-1.30	-8.80	-1.17	-3.63	1.84	-1.07	-0.69	-0.34	-0.11	-1.93
194	2.39	5.30	-0.90	-8.74	-2.00	-4.76	0.90	2.60	0.23	0.58	1.00	-2.13
195	3.10	6.28	0.47	-7.97	-1.18	-4.47	0.97	2.55	0.29	-0.25	-0.47	-2.29
196	2.63	5.24	-1.73	-7.78	-2.25	2.98	1.34	-3.06	3.56	-3.81	0.45	-1.74
197	3.99	-3.68	2.02	0.17	-2.65	-1.39	-1.44	-5.23	-3.30	5.10	3.18	1.08
198	1.99	-2.84	8.65	-1.08	1.06	2.72	4.61	-0.86	-0.69	5.18	-1.13	0.21
199	1.48	2.55	0.63	-1.59	-3.96	6.57	7.93	-1.33	-0.61	-0.77	-2.39	-0.48
200	1.31	-3.47	3.38	-5.83	-4.90	-3.41	-1.23	-0.46	2.28	1.62	-2.00	-5.71
202	4.72	4.22	4.02	0.76	-1.53	6.32	0.29	3.72	1.74	-4.59	1.05	0.65
203	3.59	8.22	4.26	3.47	0.03	2.54	-0.71	2.56	2.32	-0.11	-0.56	3.30
204	-1.21	4.24	-0.93	-5.88	1.80	5.93	3.47	-1.15	3.54	1.07	2.48	-3.60
205	3.08	7.46	-0.85	-5.59	-1.69	-1.98	4.36	-4.58	1.14	0.50	-0.53	-2.16
206	3.00	8.34	-0.18	-6.05	-0.14	-0.46	3.45	-3.58	2.93	-1.22	1.29	0.02
207	2.51	7.82	-1.95	-7.03	-1.37	-2.78	2.58	-3.65	0.25	-2.17	-0.78	0.99
208	3.06	-8.89	-1.84	1.61	1.01	1.23	5.00	-1.16	2.47	1.30	-0.82	0.70

The initial analysis revealed a 12-dimension solution with a satisfactory goodness-of-fit index. However, inspection of the configuration coordinates, in conjunction with hierarchical cluster analysis, identified only 6 interpretable dimensions. Thus, a 6-dimension MDS solution with a STRESS index of .12 and 6 interpretable dimensions was determined to be the best fit of the MDS data. Table 4.3 provides the MDS configuration coordinates for the 6-dimension solution. It should be noted that the goodness-of-fit for the 6-dimension solution is poor. However, Krustal and Wish (1978) noted that obtaining a solution with interpretable dimensions is preferable to a high-order solution with a better fit index and dimensions which are not interpretable. The following section provides the interpretation of the 6-dimension solution.

Table 4.3
Configuration Coordinates for the 6-Dimension MDS Solution

Item	Dimension					
	1	2	3	4	5	6
1	3.03	6.43	6.91	-2.59	5.25	-3.73
2	5.41	-6.04	7.97	2.25	3.11	0.45
3	5.29	0.21	9.41	2.75	-2.89	0.50
4	4.04	2.48	9.99	0.52	-3.48	2.56
5	4.86	-5.13	3.25	8.85	0.68	-4.08
6	4.68	-7.05	8.09	4.08	1.73	2.05
7	4.49	-5.04	2.51	9.07	1.18	-4.99
8	4.49	-5.04	2.51	9.07	1.18	-4.99
9	4.36	-4.39	6.51	6.22	4.06	-4.65
10	0.65	-6.03	9.33	4.92	-0.53	4.21
11	4.68	-7.05	8.09	4.08	1.73	2.05
12	5.24	-6.36	8.19	1.11	3.13	0.81
13	4.64	-5.00	5.71	-2.89	2.78	6.64
14	4.29	-6.23	6.71	-0.62	3.85	4.12
15	4.06	-8.37	5.58	1.77	-1.32	4.34
16	4.66	-2.27	7.48	4.85	-6.43	0.70
17	-9.94	-3.20	2.73	2.63	4.82	2.57
18	1.82	-4.71	5.33	-8.20	-2.70	3.25
19	1.11	-3.59	6.08	-3.38	3.34	7.80
21	6.21	-3.71	4.51	2.43	-5.35	5.44
22	4.64	-9.20	4.67	2.41	-0.70	2.25
23	5.04	-7.59	7.44	4.23	-0.00	0.64
24	4.85	-7.53	7.35	4.20	1.39	1.12
25	.57	-7.12	8.10	3.94	1.21	2.09
26	-3.54	-9.28	2.83	-0.38	1.09	3.86
27	4.75	-3.57	5.08	2.52	3.07	5.78
28	3.64	4.10	8.66	-2.08	0.83	5.00
29	4.82	-5.20	6.85	-0.68	4.83	3.34
30	-1.73	-7.04	3.88	2.15	5.76	3.81
31	1.14	2.80	5.10	4.73	6.12	5.98
32	0.89	6.61	-0.06	4.97	-2.63	-6.48
33	-3.73	4.19	5.53	-2.54	0.57	-7.02
34	0.74	-4.73	0.93	9.28	1.22	-7.21
36	-2.79	1.60	-2.03	-8.97	-5.32	5.34
37	7.19	5.50	-3.23	0.71	7.06	-1.96
38	-2.08	1.08	-10.60	-3.60	-1.57	-2.40
39	-0.33	-10.01	-3.21	-4.33	0.68	-3.25
40	2.59	-7.43	2.34	-9.53	-0.50	0.66
41	1.33	-6.47	-0.93	-8.26	5.64	-3.59
42	-0.34	-6.00	-1.06	-8.00	6.56	-3.05
43	-0.12	-6.35	-1.03	-8.11	5.92	-3.24
44	-2.38	-6.20	-3.08	-6.03	-0.36	-6.22
45	-3.49	-0.58	-1.19	-10.09	5.27	1.98
46	-5.78	-2.81	-5.17	-6.25	-6.17	1.16
47	-3.50	3.54	-4.76	-7.40	-2.26	5.76
48	-0.22	-6.35	-0.93	-7.28	6.56	-3.80
49	-1.79	-2.68	-1.86	-8.64	7.60	-1.13
53	-1.87	6.90	1.81	-10.35	1.38	0.46
56	-4.24	-2.43	0.64	6.59	6.56	-8.96
57	-3.42	-1.60	1.31	5.77	5.30	-10.78
58	2.24	9.72	4.65	0.34	-2.33	1.37
59	4.29	7.29	-0.87	-1.16	3.33	-7.32
60	2.95	7.93	3.74	1.46	-5.95	1.79
61	0.03	7.41	4.99	-7.44	3.03	4.91
62	-0.61	5.41	2.07	-8.29	5.21	3.79
63	3.59	9.16	4.12	0.33	2.65	2.63

Cont. Configuration Coordinates for the 6-Dimension MDS Solution

Item	Dimension					
	1	2	3	4	5	6
64	3.25	8.34	2.46	4.42	4.11	-0.26
65	4.96	8.47	0.59	3.68	1.38	-1.20
66	3.05	1.33	-1.06	3.85	5.69	-10.71
67	3.47	1.67	-0.62	8.48	2.99	-7.17
68	3.23	5.48	5.43	2.78	-5.74	4.17
69	3.17	6.79	5.58	0.67	-5.83	1.68
70	2.80	7.06	5.08	0.61	-6.25	1.63
71	3.56	7.35	5.29	0.05	-4.08	3.01
72	2.58	6.94	5.22	-7.37	4.69	0.72
73	1.40	0.72	1.53	1.93	10.25	-8.00
74	-1.93	7.19	2.85	-7.99	4.41	1.16
75	3.92	7.89	3.28	4.27	0.82	4.39
77	-10.43	3.93	5.87	1.58	2.16	-0.64
78	4.22	7.95	-3.52	6.94	-0.32	1.92
79	2.63	1.58	-0.60	6.74	6.17	-8.70
80	0.57	7.70	4.03	-8.01	4.48	1.48
81	3.33	7.89	-0.40	5.60	-0.76	5.45
82	0.79	7.97	3.50	-7.55	4.93	2.21
83	-3.50	9.55	-0.42	-2.15	-1.43	1.51
85	3.94	9.32	-3.68	4.40	1.95	1.83
86	3.99	9.25	-3.65	4.64	1.63	1.76
87	3.08	7.21	3.21	-5.51	8.28	2.94
88	5.62	7.32	-4.61	-1.09	0.34	5.41
89	4.03	5.85	-3.46	-5.16	-2.63	-6.75
90	4.47	8.57	-1.25	-3.00	-1.38	-5.86
91	1.60	3.89	5.83	7.43	-2.67	2.11
92	0.63	8.52	-0.66	-1.40	-4.84	4.58
94	1.66	7.45	0.21	-2.31	3.85	-6.89
95	4.41	7.57	-2.15	5.85	0.61	-1.33
96	2.54	9.70	-2.62	4.14	-2.15	-2.30
97	1.42	7.03	0.75	-7.73	7.54	2.03
98	7.37	8.78	0.59	2.10	0.24	1.23
99	3.83	9.27	-0.49	-2.37	1.02	-6.17
100	-11.30	-2.87	-2.50	3.36	0.18	2.56
101	-11.30	-2.87	-2.50	3.36	0.18	2.56
102	-11.30	-2.87	-2.50	3.36	0.18	2.56
103	-10.99	-3.32	-1.91	3.51	0.62	2.78
104	-11.30	-2.87	-2.50	3.36	0.18	2.56
105	-11.77	-2.26	-0.94	2.04	0.19	2.72
106	-7.97	0.86	3.48	7.78	-1.54	2.97
107	-11.27	-2.77	-2.38	3.80	-0.89	2.58
108	-11.30	-2.90	-2.53	3.35	0.15	2.51
109	-10.29	-4.19	-2.15	4.46	-0.98	3.35
110	-11.58	-2.58	-1.38	2.51	-0.06	2.96
111	-11.58	-2.58	-1.38	2.51	-0.06	2.96
112	-10.89	-3.40	-3.34	3.70	-2.21	2.24
113	-11.20	-4.37	-0.86	3.05	-0.95	2.61
114	-10.49	-2.02	-2.75	3.29	-1.60	4.10
115	-10.59	-2.10	-3.43	4.13	-0.07	1.87
116	-9.99	-1.40	-4.16	4.87	-0.26	1.99
117	-10.80	3.57	2.78	-0.93	2.70	-0.98
118	-11.52	3.35	4.14	-0.70	0.68	-2.00
119	-11.76	2.63	3.36	-0.32	1.22	-2.08
120	-11.72	3.27	3.06	0.44	1.77	-0.70
121	-12.01	2.68	2.83	0.26	1.44	-1.14
122	-11.91	2.63	3.15	0.35	1.64	-1.25
123	-10.87	3.97	5.08	1.29	2.70	-0.51

Cont. Configuration Coordinates for the 6-Dimension MDS Solution

Item	Dimension					
	1	2	3	4	5	6
124	-11.84	1.69	0.74	-0.49	2.14	-2.45
125	-11.91	2.63	3.15	0.35	1.64	-1.25
126	-11.81	2.99	2.95	0.10	1.62	-2.13
127	-12.03	0.89	2.03	-0.75	2.07	-0.64
128	-11.82	3.05	3.83	0.30	0.57	-1.47
129	-11.62	3.34	3.83	-0.01	-0.21	-2.73
130	-11.39	3.06	0.81	1.24	3.94	-2.94
131	-11.32	4.46	1.70	0.86	1.06	-2.70
132	3.60	-1.23	-8.57	1.34	5.27	-1.36
133	2.12	-3.23	-8.72	1.11	-4.37	3.83
134	4.71	-3.20	-7.37	4.46	0.76	4.46
135	4.19	-2.78	-7.16	4.91	-0.68	4.88
136	4.09	-1.09	-5.07	1.52	-1.66	8.88
137	3.31	-0.12	-7.41	-3.36	4.46	6.92
138	2.16	0.59	-5.11	-4.48	5.65	7.82
139	2.25	0.47	-5.41	-4.58	3.09	8.89
140	1.11	-3.92	-9.09	1.56	1.28	5.31
141	1.29	-2.24	-9.09	4.74	-2.56	-2.85
144	2.80	-0.86	-6.66	-2.55	7.35	4.69
145	3.81	2.80	-3.12	-1.28	9.71	2.65
147	4.62	0.14	-7.83	5.14	2.89	1.36
148	3.03	-5.22	-7.08	-1.84	7.56	3.24
149	3.32	4.85	-5.99	-4.05	6.68	-2.96
150	4.53	6.07	-7.76	1.04	2.99	-1.33
151	2.78	7.10	-5.60	-6.20	3.63	2.94
152	-0.86	-3.96	-9.94	-3.47	-1.72	3.66
53	2.93	-2.43	-8.46	5.35	-0.49	0.43
154	2.88	-2.38	-8.18	5.37	-2.07	0.19
155	1.44	1.11	-7.83	-2.05	-6.90	2.43
156	2.03	6.29	-8.12	0.98	-2.41	0.79
157	1.70	-3.34	-10.30	1.19	-1.59	0.18
158	2.53	-2.76	-9.90	2.17	-2.11	0.64
159	4.92	-3.51	-9.98	0.51	0.31	-0.61
160	6.37	-0.42	-7.85	-0.93	-2.14	-2.34
161	3.73	7.77	-5.24	2.73	-3.69	0.49
162	7.64	-2.36	-2.74	2.25	4.97	2.96
163	3.76	2.70	-7.70	2.51	-4.77	4.42
164	4.39	-1.62	-9.17	3.28	-3.65	-0.77
165	4.60	-0.22	-8.70	0.84	-2.00	-3.69
166	3.46	-1.55	-6.65	4.02	2.03	5.99
167	4.47	-7.53	-1.23	5.55	-2.31	3.00
168	7.36	-5.31	-7.08	-0.59	-0.84	1.50
169	-1.12	5.90	-0.73	3.54	-9.70	1.28
170	0.15	0.62	-0.95	0.77	-9.87	5.88
171	0.19	6.22	4.32	-2.09	-8.34	0.81
172	1.13	7.12	2.08	-1.31	-9.00	0.54
173	5.40	4.51	-0.09	-4.95	-7.36	-5.44
174	3.01	7.51	1.94	1.28	-7.65	1.23
175	2.18	7.45	3.33	-0.53	-7.48	1.04
176	-3.08	-1.30	-1.29	-0.86	-10.36	-6.85
177	-2.88	0.17	-2.47	0.24	-10.63	-2.78
178	-3.35	-1.47	-0.16	-1.74	-10.49	-5.58
179	-3.37	2.28	2.33	-3.42	-11.38	-1.43
180	-3.93	3.42	1.78	-3.54	-10.84	-3.80
181	-3.35	-1.47	-0.16	-1.74	-10.49	-5.58
182	-4.25	0.89	-0.63	-0.32	-9.34	-7.47
183	1.14	0.73	-9.28	1.21	3.99	2.19

Cont. Configuration Coordinates for the 6-Dimension MDS Solution

Item	Dimension					
	1	2	3	4	5	6
184	0.77	-4.73	-5.65	-5.89	-2.83	-5.53
185	2.24	-0.16	3.07	-5.49	2.26	-10.11
186	5.34	0.01	1.62	-2.33	3.16	-9.99
187	-1.74	-6.16	3.15	-7.63	-0.91	-5.00
189	3.09	-6.28	-3.01	-7.03	-1.89	-5.62
190	2.27	-9.85	-0.68	-6.15	-0.43	-4.45
191	2.27	-9.92	-0.48	-6.15	-1.43	-3.57
193	2.71	-6.58	0.09	-8.05	-3.16	-4.73
194	1.56	-5.31	1.44	-7.48	-5.11	-5.89
195	2.62	-6.07	3.22	-6.52	-3.96	-5.77
196	3.64	-6.38	-1.29	-8.69	-4.14	2.19
197	7.38	3.69	3.56	1.42	-4.42	-3.21
198	1.75	4.16	11.12	0.38	0.26	-0.17
199	0.82	-3.52	1.06	-3.65	-6.00	8.59
200	1.44	3.74	4.17	-6.90	-7.58	-0.07
202	5.66	-4.15	4.89	-1.09	-1.04	7.92
203	2.19	-8.81	4.97	4.25	0.53	3.89
204	-2.75	-5.73	0.17	-8.17	0.12	5.33
205	3.83	-9.19	0.12	-5.31	-3.48	-3.09
206	2.63	-10.12	0.95	-5.80	-2.36	-1.43
207	2.16	-9.36	-0.93	-5.96	-2.81	-4.51
208	3.30	9.85	-2.69	3.80	0.95	1.15

Interpretation of the Dimensions

Dimension 1 (Table 4.4) consists of items that measure alcohol's impact on an adolescent's ability to meet the demands of school and work. Dimension 1 was named "Social Role Performance" and was defined as "the impact of alcohol use on a young person's ability to meet the demands of being a student and employee", based on the inspection of the item content.

Dimension 2 (Table 4.5) consists of items measuring the impact of alcohol use on an adolescent's interpersonal relationships with parents, friends, boyfriends/girlfriends/significant others and people in the community. Items within this dimension address multiple aspects of interpersonal functioning, including the quality and type of relationships, as well as the way in which an adolescent treats and interacts

Table 4.4
Items for Dimension 1

Item Number	Item Statement
17	I found it hard to concentrate on my work.
77	I argued with my boss or coworkers.
100	I was failing at least one class at school.
101	I did not do my schoolwork.
102	I was late for school.
103	I was absent from school.
104	My school work was poorly done.
105	I missed deadlines for assignments.
106	My classmates complained about my behavior.
107	I neglected my schoolwork for a day or more due to my drinking.
108	My grades dropped.
109	I was placed on academic probation or suspension.
110	I did not attend school because of my drinking.
111	I failed to meet my school obligations.
112	I had to transfer to a different school.
113	I dropped out of school.
114	I failed out of school.
115	I did not attend my morning classes.
116	I did not attend my afternoon classes on Fridays.
117	I was absent from work due to my drinking.
118	I did not keep work appointments I had made.
119	I was absent from work on Mondays, Fridays, or days following
120	I was absent from work following a payday.
121	My work was of low quality or poorly done.
122	I missed work deadlines.
123	My co-workers or supervisor complained about my performance / behavior.
124	I neglected my work for a day or more because I was drinking.
125	I was late for work.
126	I drank on the job or before working.
127	I could not work.
128	I called in sick to work because of my drinking.
129	I left work early because of my drinking.
130	I went to work hungover.
131	I went to work still intoxicated from the night before.

with parents, friends, boyfriend/girlfriend/significant other and community members.

Dimension 2 was named, “Interpersonal Functioning”.

Dimension 3 (Table 4.6) consists of items measuring behaviors related to planning, obtaining, hiding and using alcohol. This dimension was named, “Alcohol Use Behavior”.

Table 4.5
Items for Dimension 2

Item Number	Item Statement
1	I was jealous of my spouse/partner.
3	I was critical of others.
4	I was unforgiving of others.
16	I felt like hurting other people.
28	I blamed others for my problems.
32	I forgot conversations I had with others.
33	I forgot commitments I had made.
37	I lived with others who drank alcohol.
53	I had to move back home with my parents.
58	I experienced problems with other people.
59	I experienced problems with a significant other.
60	I argued with other people.
61	I refused to obey my parents.
62	I avoided my family.
63	I avoided my friends.
64	I avoided people who did not drink.
65	I had no or very few friends other than those with whom I drank.
68	I threatened other people.
69	I yelled or screamed at others for no reason.
70	I argued with people.
71	I insulted people.
72	I failed to help family members when they needed it.
74	I missed important family events.
75	I was loud in social gatherings.
78	I hung out with people I thought would not mind my drinking.
80	I did not get along with my parents.
81	I pressured others I was with to drink.
82	My drinking created problems between me and my parents.
83	I did not keep social appointments I had made.
85	My friends drank regularly.
86	Getting together with friends usually included drinking alcohol.
87	My parents used alcohol regularly.
89	I have had unprotected sex while using alcohol.
90	I have "hooked-up" with someone while drinking.
91	I was bothered if people asked me personal questions.
92	I depended on others to help me get home.
94	I lied to my boyfriend/girlfriend about my drinking.
95	I needed alcohol in order to talk to others.
96	I count on others to tell me what happened while I was drinking the night before.
97	I lied to my parents about where I was.
98	I have lost friends because of my drinking.
99	My relationship with a boyfriend/girlfriend ended because of my drinking.
156	I drank more than the other people I was with.
161	I arrived to social gatherings intoxicated.
163	I pre-gamed before going to a sporting event, party or the bars.
169	I destroyed property belonging to others while intoxicated.
170	-0.82 I took things that didn't belong to me while intoxicated.
171	I hit or injured someone in a fight while intoxicated.
172	I used a weapon in a fight while intoxicated.
173	I sexually assaulted someone while intoxicated.
174	I got into physical fights with others.
175	I hit, slapped, kicked or threw things at others.
185	I had problems performing sexually.
186	I wasn't interested in sex.
197	When I talked, people had a hard time understanding me.
198	I had difficulty understanding other people when they talked to me.
200	I was hurt or injured in a fight while intoxicated.
208	Drinking alcohol helped me make friends.

Table 4.6
Items for Dimension 3

Item Number	Item Statement
88	I hung out with older people who bought me alcohol.
132	I spent time trying to get something to drink.
133	When I drank, I did so at regular times of the week or weekend.
134	I worried I would run out of alcohol on weekends.
135	I made sure I didn't run out of alcohol on weekends.
136	I worried that alcohol would not be served at a party or a social event.
137	I hid alcohol around the house, apartment or dorm room so I would have it
138	I hid alcohol around the house, apartment or dorm room, so others wouldn't know how much I was drinking.
139	I bought alcohol at different places so no one would know how much I drank.
140	I would buy enough alcohol to make sure I had it when I needed it.
141	I switched from one type of drink to another while drinking.
144	I hid alcohol in different places where it was easily accessible.
145	I tried to hide my drinking from others.
147	I planned when I was going to drink.
148	I tried to cover up the smell of alcohol on my breath.
149	I snuck alcohol from my parents or others refrigerator or liquor cabinet
150	I asked people over the age of 21 to buy me alcohol.
151	I snuck back into the house after drinking so my parents wouldn't find out.
153	I drank more than I intended.
154	I drank longer than I intended.
155	I drank in a place or at a time when it was dangerous to do so.
157	I drank during the day.
158	I drank for more than 12 hours at a time.
159	I drank before noon.
160	Once I started drinking, it was hard to stop.
162	I drank to feel normal.
164	I drank alcohol in order to get drunk.
165	I drank more than I should have.
166	When I was not drinking, I wanted to be.
167	I felt I'd lost control of my drinking.
168	I had to drink a lot in order to feel drunk.
183	I used a fake ID to buy alcohol or get into a bar.

Dimension 4 (Table 4.8) consists of items measuring the impact of alcohol use on an adolescent's overall physical health, ability to take care of their personal appearance and living areas and the negative affects of alcohol intoxication. This dimension was named, "Personal Health and Hygiene".

Table 4.7
Items for Dimension 4

Item Number	Item Statement
18	I hurt myself on purpose.
39	I missed 2 or more meals a day.
40	I didn't eat right.
41	I did not bathe.
42	I did not brush my teeth.
43	I did not wear clean clothes.
44	I did not take medication I was prescribed on schedule.
45	I neglected household duties.
48	I spent little time on my personal hygiene.
49	I did not clean my house.
184	After drinking I had a hangover or a headache.
187	I had trouble falling asleep and/or staying asleep.
189	I vomited.
190	I had trouble controlling my bladder.
191	I had trouble controlling my bowels.
193	I vomited blood.
194	I went to the emergency room.
195	I was hospitalized.
196	I continued to drink even though it affected my health.
199	I didn't remember things I did or said while I was drinking.
204	I stayed in bed or on the couch all day.
205	I had difficulty controlling my hands.
206	I had difficulty controlling my movements.
207	I had indigestion or stomach problems due to my drinking.

Dimension 5 (Table 4.9) includes items measuring the legal and financial consequences due to an adolescent's alcohol use. Dimension 5 was named, "Legal-Financial Consequences".

Dimension 6 (Table 4.10) includes items measuring an adolescent's involvement in activities which promote psychological, emotional and physical well-being. In addition, this dimension contains items measuring psychological distress. This dimension was named, "Psychological Well-Being."

Table 4.8
Items for Dimension 5

Item Number	Item Statement
36	I moved due to financial or other problems resulting from my drinking.
38	I spent most of my money on alcohol.
46	I did not have enough money to pay my bills.
47	I had to borrow money from others.
152	I set aside money to buy alcohol.
176	I was ticketed for underage drinking.
177	I drove when I was drunk.
178	I was arrested because of my drinking.
179	I had an accident while driving under the influence.
180	I was arrested for public intoxication.
181	I spent time in jail because of my drinking.
182	I got in trouble with the police because of my drinking.

Table 4.9
Items for Dimension 6

Item Number	Item Statement
2	I was irritable.
6	I felt afraid.
5	I felt calm.
7	I felt secure.
8	I felt happy.
9	I felt optimistic.
10	I felt agitated, restless, or couldn't sit still.
11	I felt hopeless.
12	I felt sad, blue, or depressed.
13	I thought about harming myself.
14	I thought about killing myself.
15	My mood changed quickly.
19	I couldn't get certain thoughts out of my mind.
21	I had difficulty controlling my behavior.
22	I had difficulty controlling my emotions.
23	I felt nervous, fidgety, tense or anxious.
24	I was easily frustrated.
25	I felt confused.
26	I had difficulty solving problems.
27	Nothing was fun for me.
29	I preferred to be alone.
30	I could not focus.
31	When I was sober, I regretted the things I said or did while drinking.
34	I am satisfied with my life.
56	I took part in activities outside of school or work.
57	I have interests outside of school or work.
66	I spent time with a boyfriend, girlfriend or significant other.
67	I felt comfortable being around others who did not drink.
73	I took part in family activities.
79	I helped my friends when they needed it.
202	I didn't feel like going out or doing anything.
203	I felt I just couldn't get going.

The 6 dimensions, their items and domain definitions are presented in Appendix C. These 6 content domains and their definitions were used in Study II to identify the most relevant items within each content domain.

Study II

Aiken's Validity Index

Item relevance data were analyzed using Aiken's (1980) Validity Index. The index accounts for the number of categories used to rate each item and for the number of participants who responded. The equation is as follows:

$$V = \frac{\sum_{i=1}^{c-1} in_1}{N(c-1)}$$

where,

c is the number of categories on the item importance rating scale,

i is the weight given to each category

ni is the number of judges who rated the item in the i th category, and

N is the total number of participants.

The original rating scale had 11 rating categories, ranging from -1 (least important) to +5 (most important). To prepare the Q-sort data for analysis, the original rating scale was converted into an 11-point importance rating scale, where -5 equaled a rating of 1, 0 equaled a rating of 6 and a rating of +5 equaled a rating of 11 (McKeown & Thomas, 1988). The converted ratings were then transformed for the index calculations, by giving each rating category a weight of $c-1$ (Aikens, 1980), such that the rating category 1 was given a weight of 0, the rating category of 2 a weigh of 1, and so forth, with the highest rating category, 11, receiving a weight of 10.

Sireci and Gelsinger (1995) provide guidelines for the interpretation of V . When V is large, ranging from .60-1.0, there is agreement among participants that the item is important or relevant to the content domain. When V is small, ranging from 0-.4, there is agreement among participants that the item is not important or relevant to the content domain. Moderate index values, ranging from .4-.6, indicate poor agreement among participants regarding the relevance of the item to the specified content domain. In their guidelines, Sireci and Gelsinger do not provide a suggested cut-off V -value for the removal of items from a content domain. Rather they provide general guidelines for their interpretation.

As the purpose of Study II was to determine which items were the most important or relevant for each content domain, a cut-off value for V was needed in order to determine which items to remove from each content domain. As Sireci and Gelsinger (1998) noted the interpretation of V -values and a cut-off criterion for removal of items will depend on how item relevance ratings were obtained. The Q-sort method used to obtain the item ratings had a distinct mid-point, which participants were encouraged to place items which were “neither important nor un-important”. Therefore, moderate V -values ranging from .4 to .6 indicates ambivalence among raters on the item’s importance. As the purpose of Study II was to determine which items were most important for a content domain it was determined that items which were either rated as unimportant by raters (V ranging from 0-.4) or received an ambivalence rating (V ranging from .4-.6) would be removed from the item set.

The Aiken’s (1980) Validity Indexes for the 6 content domains are presented in Table 4.11. For the Social Role Performance domain, 6 items had low to moderate ($V <$

.60) index values. The Interpersonal Functioning domain had 15 items with low to moderate index values ($V < .60$). Six item in the Alcohol Use Behavior domain had a low-moderate index value ($V < .60$). The Personal Health and Hygiene domain had six items

Table 4.10
Aiken's Validity Indexes for Dimensions 1-6

Item	Dimensions										
	1	2	3	4	5	6					
17	.68	1	.47	88	.60	18	.91	36	.86	2	.52
77	.68	3	.53	132	.67	39	.66	38	.92	5	.64
100	.76	4	.50	133	.52	40	.58	46	.89	6	.59
101	.72	16	.79	134	.63	41	.71	47	.78	7	.83
102	.49	28	.67	135	.67	42	.67	152	.72	8	.90
103	.69	32	.58	136	.65	43	.63	176	.73	9	.75
104	.71	33	.58	137	.77	44	.74	177	.91	10	.57
105	.68	37	.49	138	.80	45	.48	178	.85	11	.68
106	.57	53	.68	139	.72	48	.67	179	.90	12	.70
107	.74	58	.62	140	.75	49	.47	180	.83	13	.86
108	.80	59	.59	141	.47	184	.49	181	.88	14	.87
109	.79	60	.62	144	.73	187	.59	182	.81	15	.58
110	.66	61	.74	145	.76	189	.70			19	.53
111	.78	62	.73	147	.52	190	.74			21	.77
112	.55	63	.66	148	.58	191	.77			22	.69
113	.81	64	.60	149	.75	193	.89			23	.62
114	.83	65	.72	150	.67	194	.92			24	.53
115	.61	68	.83	151	.69	195	.97			25	.59
116	.54	69	.67	153	.52	196	.86			26	.61
117	.81	70	.60	154	.61	199	.73			27	.40
118	.69	71	.67	155	.82	204	.47			29	.45
119	.63	72	.77	157	.54	205	.64			30	.71
120	.47	74	.74	158	.82	206	.66			31	.76
121	.68	75	.45	159	.63	207	.80			34	.95
122	.72	78	.55	160	.85					56	.72
123	.76	80	.72	162	.75					57	.72
124	.74	81	.80	164	.68					66	.64
125	.55	82	.91	165	.73					67	.72
126	.88	83	.55	166	.68					73	.55
127	.73	85	.62	167	.90					79	.80
128	.74	86	.66	168	.65						
129	.69	87	.77	183	.66						
130	.65	89	.90								
131	.81	90	.74								
		91	.48								
		92	.73								
		94	.72								
		95	.77								
		96	.76								
		97	.67								
		98	.88								
		99	.82								
		156	.76								
		161	.77								

Cont. Aiken's Validity Indexes for Dimensions 1-6

Item	1	Item	2	Dimensions		Item	3	Item	4	Item	5	Item	6
		163	.55										
		169	.87										
		170	.76										
		171	.87										
		172	.90										
		173	.91										
		174	.82										
		175	.85										
		185	.53										
		186	.39										
		197	.60										
		198	.54										
		200	.82										
		208	.62										

with low to moderate index values ($V < .60$). For the Legal-Financial Consequences domain no items had index values below .60. For the Psychological Well-being domain, 12 items had index values below .60 (low to moderate values). A total of 45 items were removed from across the 6 content domains, leaving a total of 147 items in the item set.

CHAPTER V DISCUSSION

Level of functioning is a risk/protective factor for the development of an alcohol use problem and is a psychosocial outcome affected by the onset of an alcohol use problem in late-adolescence (Bukstein & Winters, 2004; Brown, 2004; Wagner, 2008; Clark, 2004). However, currently there are no level of functioning measures which index the affects of alcohol use on late-adolescent functioning. This gap in the literature exists in spite of the importance the literature places on understanding the short-term and long-term impact of alcohol use on adolescent functioning.

Late adolescence is a developmental transition period in which social/cultural factors (i.e., social norms permitting the misuse of alcohol as a rite of passage), interpersonal factors (i.e., decreased parental monitoring and increased peer exposure) and psycho-behavioral factors (i.e., increased sensation seeking and impulsive behavior) may lead to the establishment and continuity of problematic alcohol use behavior from late adolescence to early adulthood (Zucker, 2003). The longitudinal research and the theoretical literature suggest that problematic alcohol use during late adolescence has a negative impact on an adolescent's level of functioning and potentially later functioning in adulthood (Wells, et al., 2004; Hill, et al., 2006). Our understanding of how an adolescent's alcohol use affects their level of functioning is limited; however, recent qualitative research (Lucey, 2009) determined that adolescent alcohol use has an impact on an adolescent's intrapersonal functioning, interpersonal functioning and social role performance at school and work. Further, the data revealed that in order to understand how alcohol use impacts functioning, it is important to take into consideration the

adolescent's alcohol use behavior and its consequences as it provides the context for understanding alcohol-related functional impairment. Therefore, it is not sufficient to measure one component of an adolescent's involvement with alcohol, such as alcohol use behavior or level of functioning. Rather, it appears taking a broader approach, in which the biological, psychological and social aspects of the impact of alcohol use on functioning are measured, may provide a more valid and useful tool to understand an adolescent's involvement with alcohol. The proposed Relationships with Alcohol Scale is a biopsychosocial measure of late-adolescents alcohol use behavior and its consequences and its impact on intrapersonal functioning, interpersonal functioning and social role performance at school and work.

The purpose of the current studies was to determine the content domains, content definitions and item representativeness of the Relationship with Alcohol Scale. In the following section, a summary of the results of the studies will be presented and a detailed description of the Relationship with Alcohol Scale and its content domains will be presented. Limitations and recommendations for further development of the RAS will be discussed.

Summary of Results

It was hypothesized that a 10-dimension solution would be obtained from the MDS analysis. The 10-dimensions were hypothesized to represent the content domains of: 1) Psychological/Emotional Well-Being, 2) Behavior Promoting Well-Being, 3) Interpersonal Functioning, 4) Behaviors Organized Around Alcohol Use, 5) Decision-Making Related to Alcohol Use, 6) Physical Affects of Alcohol Use, 7) Legal-Financial Problems, 8) School Performance, 9) Work Performance and 10) Violation of Other's

Rights. Contrary to this hypothesis, a 6-dimension solution was obtained from the MDS analysis. Visual inspection of the 6-dimensional coordinates and follow-up cluster analysis determined the 6 dimensions represented the content domains of: 1) Social Role Performance, 2) Interpersonal Functioning, 3) Alcohol Use Behavior, 4) Personal Health and Hygiene, 5) Legal-Financial Problems, and 6) Psychological Well-Being.

The item relevance data identified 45 items with low ($<.60$) item-relevance indexes. These 45 items were removed, leaving a total of 147 items across the 6 domains of the Relationship with Alcohol Scale.

The Relationship with Alcohol Scale for Late Adolescents

This study was motivated by a perceived need to identify late-adolescents whose alcohol use is negatively impacting their functioning in a variety of life domains, in order to intervene more effectively to ameliorate both harmful drinking patterns and improve current and future functioning. The current level of functioning literature and adolescent alcohol use literature provided the foundation for how to develop a measure indexing the impact of alcohol use on late-adolescents' functioning. Specifically, the development of such a measure would need to account for developmental factors, include important domains impacted by alcohol use behavior and be based on a clear conceptual model. In this next section, the RAS and its content domains will be discussed.

Level of Functioning Domains

The Relationship with Alcohol Scale for Late-Adolescence uses a biopsychosocial framework for conceptualizing the impact of alcohol use on a late-adolescent's psychosocial functioning. The RAS measures the biological aspects (i.e., physical effects of alcohol use, physiological aspects of alcohol use behavior),

psychological aspects (emotional and psychological well-being, cognitive abilities, and social role performance) and the social aspects (i.e., relationships with intimate partners, family and friends, legal problems) of late-adolescent alcohol use behavior. The biopsychosocial framework for understanding the impact of late-adolescent alcohol use on functioning permits for items measuring the biological, psychological and social aspects of alcohol use to be included across all of the content domains of the RAS. This allows for a more comprehensive and complex conceptualization of the impact of alcohol use behavior on late-adolescent functioning. This is directly observed in the results of the MDS analysis which combined items from a variety of biological, psychological and social items into each content domain.

A particular strength of the RAS is its targeted developmental time period (i.e., late-adolescence), which is characterized as a transitional period marked by increased autonomy and responsibility for behavior (Brown et al., 2008). Additionally, late-adolescence is marked by a steady increase in alcohol use, which is episodic and heavy in nature. The use of late-adolescents as content “experts” aided in the identification of content domains which were relevant and developmentally appropriate for this age group. For example, the emergence of a comprehensive interpersonal functioning domain consisting of a variety of types of interpersonal relationships and interpersonal behaviors, points to the complexity of interpersonal relationships during this developmental period. This comprehensive conceptualization of interpersonal relationships would not have been observed if late-adolescents had not served as the content “experts” in this study.

The Relationship with Alcohol Scale contains 4 content domains which are consistent with domains from commonly used global assessments of functioning. The 6 content domains measuring aspects of functioning include: Social Role Performance, Interpersonal Functioning, Personal Health and Hygiene, and Psychological Well-Being-Psychological Distress. In the following section the content domains of the RAS will be described. For ease of discussing the item content of each domain, items and their hypothesized domain are presented in Tables 5.1-5.6.

A unique aspect of the level of functioning domains of the RAS is their specific focus on the impact of alcohol use on level of functioning. The commonly used level of functioning measures utilize a global approach to defining content domains. That is to say, they attempt to measure functional impairment independent of the problem behavior or disorder. While there may be global content areas of functioning impacted by most or all problem behaviors or disorders, such as interpersonal functioning, school/work performance and life satisfaction (Bird & Gould, 1995), the way in which any given problem behavior or disorder manifests itself as a functional impairment may differ. For example, the Social Role Performance item from the RAS, “I went to work hungover”, describes an alcohol-specific work performance item. The inclusion of items targeting alcohol-specific functional impairment, may provide a more sensitive measure of functional impairment, as it is able to pick up on problem specific functional impairments that global assessments may not be able to capture and in turn improve the validity of the content domains.

The Social Role Performance domain (Table 5.1) has 28-items and is defined as “the impact of alcohol use on a young person’s ability to meet the demands of being a

Table 5.1
Item Content of the Social Role Performance Domain Organized by Hypothesized Domain

Hypothesized Domain	Item Statement
School Performance	I was failing at least one class at school. I did not do my schoolwork. I was absent from school. My school work was poorly done. I missed deadlines for assignments. I neglected my schoolwork for a day or more due to my drinking. My grades dropped. I was placed on academic probation or suspension. I did not attend school because of my drinking. I failed to meet my school obligations. I dropped out of school. I failed out of school. I did not attend my morning classes.
Work Performance	I was absent from work due to my drinking. I did not keep work appointments I had made. I was absent from work on Mondays, Fridays, or days following My work was of low quality or poorly done. I missed work deadlines. My co-workers or supervisor complained about my performance / behavior. I neglected my work for a day or more because I was drinking. I drank on the job or before working. I could not work. I called in sick to work because of my drinking. I left work early because of my drinking. I went to work hungover. I went to work still intoxicated from the night before. I found it hard to concentrate on my work. I argued with my boss or coworkers.

student and employee.” The 28 items of the Social Role Performance items were originally hypothesized to make up the School Performance and Work Performance domains. The combining of school and work performance items into a single domain, participants created what Bird (1999) conceptualized as a primary component of level of functioning, one’s social role performance.

The Interpersonal Functioning domain (Table 5.2) consists of 43-items and is defined as “the impact of alcohol use on how a young person treats and interacts with people, including: boyfriends/girlfriends/significant others, parents, family, friends; and

people in the community.” The majority of items making up the Interpersonal Functioning

Table 5.2
Item Content of the Interpersonal Functioning Domain Organized by Hypothesized Domain

Hypothesized Domain	Item Statement
Interpersonal Functioning	<p>I experienced problems with other people. I argued with other people. I refused to obey my parents. I avoided my family. I avoided my friends. I avoided people who did not drink. I had no or very few friends other than those with whom I drank. I yelled or screamed at others for no reason. I argued with people. I insulted people. I failed to help family members when they needed it. I missed important family events. I did not get along with my parents. I pressured others I was with to drink. My drinking created problems between me and my parents. My friends drank regularly. Getting together with friends usually included drinking alcohol. My parents used alcohol regularly. I have had unprotected sex while using alcohol. I have “hooked-up” with someone while drinking. I depended on others to help me get home. I lied to my boyfriend/girlfriend about my drinking. I needed alcohol in order to talk to others. I count on others to tell me what happened while I was drinking the night before. I lied to my parents about where I was. I have lost friends because of my drinking. My relationship with a boyfriend/girlfriend ended because of my drinking. Drinking alcohol helped me make friends. I threatened other people.</p>
Decision Making About Alcohol Use	<p>I drank more than the other people I was with. I arrived to social gatherings intoxicated.</p>
Violation of Other’s Rights	<p>I used a weapon in a fight while intoxicated. I sexually assaulted someone while intoxicated. I got into physical fights with others. I hit, slapped, kicked or threw things at others. I destroyed property belonging to others while intoxicated. I took things that didn’t belong to me while intoxicated. I hit or injured someone in a fight while intoxicated.</p>
Physical Effects of Alcohol Use	<p>When I talked, people had a hard time understanding me. I was hurt or injured in a fight while intoxicated.</p>
Psychological/Emotional Well-Being	<p>I felt like hurting other people. I blamed others for my problems.</p>
Legal-Financial Problems	<p>I had to move back home with my parents.</p>

domain were originally hypothesized to be a part of the Interpersonal Functioning domain. The items included in this domain capture a variety of relationships important to late-adolescents, including parents, family, friends, and boyfriend/girlfriend/significant others and people in the community. Further, these items measure a variety of interpersonal behaviors specific to certain types of relationships. This is most evident in items measuring interpersonal behavior impacting intimate relationships and relationships with parents. Developmentally, the inclusion of items measuring intimate and sexual behavior is appropriate, particularly for the late-adolescent time period (ages 16-20), as this is when adolescents begin to engage in intimate and sexual behavior and become increasingly important in an adolescent's life (Brown et al., 2008). Other level of functioning measures (Price et al., 2002) have attempted to include items measuring intimate and sexual relationships, however these items often have the poorest psychometric properties. This may be due to the failure of these measures to distinguish between early, middle and late adolescence. Rather, all adolescents are treated as developmentally similar. However, there is great variability and change throughout the developmental period of adolescence and the aspects of functioning most relevant to adolescents will differ depending on where they are developmentally. The use of a restricted developmental time period (i.e., late-adolescents) permitted for developmentally salient domains to emerge from the item set of the RAS. It would be expected that on further development of the RAS, developmentally salient content domains, such as the Interpersonal Functioning domain, will provide relevant and salient

information to clinicians and researchers regarding the impact of alcohol use on late-adolescent functioning.

Interestingly, items which were hypothesized to be Psychological and Emotional Well-Being items were also included in the Interpersonal Functioning domain. These items specifically deal with emotional reactions to others (e.g. “I was unforgiving of others.”). Items which were originally hypothesized to be part of the Violation of Other’s Rights were also included in the Interpersonal Functioning domain. These items specifically measure violent behavior directed towards others and their property. Items from the hypothesized domain of Physical Effects of Alcohol were also included in the Interpersonal Functioning domain. These items relate to the social impairments that accompany alcohol intoxication (e.g., “When I talked, people had a hard time understanding me.”) and the consequence of engaging in violent behavior while intoxicated (e.g., “I was hurt or injured in a fight, while intoxicated.”). Two items in the Interpersonal Functioning domain were originally hypothesized to be a part of the Decision-Making About Alcohol Use domain. These two items use friends or peers as the referent for comparing the young person’s alcohol use behavior. For example, the item “I drank more than the other people I was with” compares the individual’s alcohol use behavior to their friends. One item from the hypothesized domain of Legal-Financial Problems was included in the Interpersonal Functioning domain. This item, “I had to move back home with my parents”, this item measures a financial problem which impacts the relationship an adolescent has with their parents.

The Psychological Well-Being domain (Table 5.3) consists of 20-items and is defined as “the engagement in activities that make a young person feel good physically,

Table 5.3
Item Content of the Psychological Well-Being Domain Organized by Hypothesized Domain

Hypothesized Domain	Item Statement
Psychological/Emotional Well-Being	I felt calm. I felt secure. I felt happy. I felt optimistic. I felt hopeless. I felt sad, blue, or depressed. When I was sober, I regretted the things I said or did while drinking. I thought about harming myself. I thought about killing myself. My mood changed quickly. I had difficulty controlling my I had difficulty controlling my emotions. I am satisfied with my life. I felt nervous, fidgety, tense or anxious. I had difficulty solving problems. I could not focus.
Behavior Promoting Well-Being	I took part in activities outside of school or work. I have interests outside of school or work.
Interpersonal Functioning	I helped my friends when they needed it. I spent time with a boyfriend, girlfriend or significant other. I felt comfortable being around others who did not drink.

emotionally and psychologically, as well as the absence of negative emotions/feelings.”

Conceptually, this domain is distinct from other domains in the RAS. The Psychological Well-Being-Distress domain consists of a positive (well-being) and a negative (distress) dimension. This domain structure reflects Keyes’ (XXXX) conceptualization of psychological well-being as the presence of positive affect and the absence of negative affect/symptoms. The majority of the Psychological Well-Being-Psychological Distress items were originally hypothesized to be part of the Psychological and Emotional Well-Being domain. These items measure the presence of positive affect (e.g., “I felt happy.”), as well as negative affect, (“I felt sad, blue or depressed). The Psychological Well-Being-Psychological Distress domain items also were made up of items from the hypothesized Interpersonal Functioning and Behaviors Promoting Well-Being domains. These items

measure a young person's involvement in activities promoting psychological well-being and protect against psychological distress (e.g., "I took part in activities outside of school and work."). The combination of items representing the presence of positive affect, negative affect/symptoms and engagement in activities promoting psychological well-being closely resembles conceptualizations of psychological well-being as the self-evaluation of affect and quality of life (Diener, 1984). The emergence of a separate domain representing psychological well-being is particularly interesting in the context of mental health research, suggesting the presence of psychological well-being is a protective factor against the development of mental health problems (Keyes, 2007). The emergence of a Psychological Well-Being domain from the original item set, suggests that psychological well-being is a distinct area of life for late-adolescents.

The Personal Health and Hygiene domain (Table 5.6) is made up of 18-items and is defined as "the impact of alcohol use on a young person's ability to take care of their personal appearance, living areas and overall health, as well as the negative physical effects of alcohol intoxication". The items representing the domain of Personal Health and Hygiene were originally hypothesized to be a part of the Behaviors Promoting Well-Being and Physical Effects of Alcohol Use domains. The Personal Health and Hygiene domain represents a hybrid of items. It includes daily-living and self-care items typically seen on a level of functioning measure and items measuring the physical effects of alcohol intoxication. In the context of adolescent alcohol use behavior the combination of functional behavior and the physical effects of alcohol intoxication is conceptually sound, as late-adolescents engage in episodic, heavy drinking and drink alcohol to get drunk

Table 5.4
Item Content of the Personal Health and Hygiene Domain Organized by Hypothesized Domain

Item Number	Item Statement
Behaviors Promoting Well-Being	I missed 2 or more meals a day. I did not bathe. I did not brush my teeth. I did not wear clean clothes. I did not take medication I was prescribed on schedule. I spent little time on my personal hygiene.
Physical Effects of Alcohol Use	I vomited. I had trouble controlling my bladder. I had trouble controlling my bowels. I vomited blood. I went to the emergency room. I was hospitalized. I didn't remember things I did or said while I was drinking. I had difficulty controlling my hands. I had difficulty controlling my movements. I had indigestion or stomach problems due to my drinking.
Decision Making About Alcohol Use	I continued to drink even though it affected my health.
Psychological/Emotional Well-Being	I hurt myself on purpose.

(Lucey, 2009), thus the impact of alcohol use on self-care and daily living behaviors will likely be related to their episodic alcohol intoxication (i.e., the physical effects of alcohol use). Again, this domain represents a unique domain definition for Personal Health and Hygiene, which takes into account both the developmentally specific patterns of alcohol use of late-adolescents and the specific impact of alcohol use on functioning (i.e., self-care and daily living activities).

Alcohol Use and Consequences Domains

The remaining two domains of the RAS, Alcohol Use Behavior and Legal Problems, are content domains measuring behaviors related to alcohol use and the legal consequences of underage alcohol use. The inclusion of these domains are consistent

with commonly used comprehensive adolescent substance use assessments (Winters et al., 1996; Kaminer et al., 1995; Friedman & Utada, 1989), which include items measuring substance use patterns and legal status.

The Alcohol Use Behavior domain (Table 5.5) consists of 26-items and is defined as “behaviors related to planning, hiding, obtaining and drinking alcohol.” The Alcohol Use Behavior domain combines items from Behaviors Organized Around Alcohol Use and Decision-Making About Alcohol Use. The emergence of one domain representing alcohol use behavior indicates that participants did not perceive a distinction among items related to alcohol use behavior. Two additional items (“I hung out with older people who bought me alcohol.” and “I used a fake ID to buy alcohol or get into a bar.”) were items hypothesized to be a part of the Interpersonal Functioning and the Legal Problems domains, respectively. Inspection of the item “I hung out with older people who bought me alcohol” indicates that this item does not capture an interpersonal interaction, but rather a means by which to obtain alcohol, which is more appropriate for inclusion in a domain measuring alcohol use behavior. Similarly, the item “I used a fake ID to buy alcohol or get into a bar”, while an illegal behavior, is perceived by participants as more similar to behaviors related to obtaining alcohol, rather than a legal problem.

What is different about the Alcohol Use Behavior domain of the RAS is that it does not focus on DSM-IV (American Psychiatric Association, 2004) symptoms of alcohol abuse or dependence. Rather, the Alcohol Use Behavior domain measures behaviors related to planning, obtaining, hiding and using alcohol. These items reflect two important characteristics of late-adolescent alcohol use: it’s episodic and heavy nature and the large amount of time and planning required to obtain and use alcohol

(Wagner, 2008; Lucey, 2009). Previous research (Lucey, 2009), indicated the impact of alcohol use on a late-adolescent's life fluctuates depending on their current alcohol use pattern. This may occur as a function of the heavy, episodic alcohol use pattern of late-

Table 5.5
Item Content of the Alcohol Use Behavior Domain Organized by Hypothesized Domain

Hypothesized Domain	Item Statement
Behavior Organized Around Alcohol	<p>I spent time trying to get something to drink.</p> <p>I worried I would run out of alcohol on weekends.</p> <p>I made sure I didn't run out of alcohol on weekends.</p> <p>I worried that alcohol would not be served at a party or a social event.</p> <p>I hid alcohol around the house, apartment or dorm room so I would have it</p> <p>I hid alcohol around the house, apartment or dorm room, so others wouldn't know how much I was drinking.</p> <p>I bought alcohol at different places so no one would know how much I drank.</p> <p>I would buy enough alcohol to make sure I had it when I needed it.</p> <p>I hid alcohol in different places where it was easily accessible.</p> <p>I tried to hide my drinking from others.</p> <p>I snuck alcohol from my parents or others refrigerator or liquor cabinet</p> <p>I asked people over the age of 21 to buy me alcohol.</p>
Decision Making About Alcohol Use	<p>I drank longer than I intended.</p> <p>I drank in a place or at a time when it was dangerous to do so.</p> <p>I drank for more than 12 hours at a time.</p> <p>I drank before noon.</p> <p>Once I started drinking, it was hard to stop.</p> <p>I drank to feel normal.</p> <p>I drank alcohol in order to get drunk.</p> <p>I drank more than I should have.</p> <p>When I was not drinking, I wanted to be.</p> <p>I felt I'd lost control of my drinking.</p> <p>I had to drink a lot in order to feel drunk.</p>
Interpersonal Functioning	<p>I hung out with older people who bought me alcohol.</p> <p>I snuck back into the house after drinking so my parents wouldn't find out.</p>
Legal-Financial Problems	<p>I used a fake ID to buy alcohol or get into a bar.</p>

adolescents and also may reflect an increased amount of time spent planning, obtaining, using and recovering from alcohol use during these episodic, heavy drinking periods. The Alcohol Use Behavior domain is hypothesized to provide contextual information to aid in

the interpretation of the alcohol-specific level of functioning domains. However, the relationships between the Alcohol Use Behavior domain and the other domains of the RAS are not yet established due to the early stages of development of this measure. Further psychometric studies will be necessary in order to determine the relationships between the domains of the RAS.

The final domain, Legal-Financial Problems (Table 5.8) consists of 12-items and is defined as “Involvement with the police or the legal system because of a young person’s alcohol use, as well as having money problems because of a young person’s alcohol use.” All 12-items making up the Legal-Financial Problems domain were originally hypothesized to be part of the domain Legal-Financial Problems. The inclusion of a Legal-Financial Problems domain of the RAS reflects the legal and fiscal consequences of underage drinking. It is important to include the legal consequences of alcohol use behavior in an alcohol-specific level of functioning measure, as involvement with the legal system, as it reflects the larger social context in which adolescent alcohol use takes place (Zucker, 2003) thus providing additional information for interpretation of RAS scores.

Table 5.6
Item Content of the Legal-Financial Problems Domain Organized by Hypothesized Domain

Hypothesized Domain	Item Statement
Legal-Financial Problems	I moved due to financial or other problems resulting from my drinking. I spent most of my money on alcohol. I did not have enough money to pay my bills. I had to borrow money from others. I set aside money to buy alcohol. I was ticketed for underage drinking. I drove when I was drunk. I was arrested because of my drinking. I had an accident while driving under the influence. I was arrested for public intoxication. I spent time in jail because of my drinking. I got in trouble with the police because of my drinking.

Limitations

A critical issue in any content validity study is the selection of participants to make judgments about item similarity and item-relevance. Typically, in content validity studies using MDS or item-relevance ratings participants are selected for their expertise in a content area. In the case of educational test development, this usually means participants are experts in the particular subject area being measured by the educational test (Sireci, 1998). For the current studies, it was determined that late-adolescents were “experts” of late-adolescent alcohol use behavior and its impact on functioning. The sample used in Studies I and II were community samples of late-adolescents, with a non-problematic alcohol use. By using a community sample of late-adolescents rather than a clinical sample (i.e., adolescents who are currently seeking treatment for alcohol use disorders) the identification of content domains and item-relevance ratings may not capture the severe impact of alcohol use on functioning. In order to ensure that the full

impact of alcohol use on functioning is captured in the content domains of the RAS, a replication of Studies I and II with a clinical sample of late-adolescents who are receiving treatment for alcohol use disorders will be necessary.

The methodology used in this study; a simple sorting task and Q-sorting task; may not have permitted for a representative sample of late-adolescent “experts” as suggested in the literature (Sireci, 1998), as the task required participants to be able to understand a fairly ambiguous and abstract task, comprehend written statements and make judgments about these statements based on some criteria, in a short amount of time. The cognitive demands of the sorting tasks may have inadvertently excluded late-adolescents who may have had poor reading skills or were less skilled in abstract verbal reasoning.

Given the age of participants, grade level and typical cognitive abilities of this age group in this study the sorting tasks were developmentally appropriate. However, individual differences in academic achievement and cognitive ability cannot be ignored. While, all participants were able to complete the sorting tasks, there was considerable variability in the time it took to complete the tasks, as well as the problem-solving methods used to complete the tasks. These behavioral observations are anecdotal and were not systematically observed across the sorting tasks. However, given the observation of individual differences during the sorting task it is not possible to rule out that some participants may have had more difficulty with the task thus impacting their task performance. Future studies utilizing late-adolescents as experts in simple sorting and Q-sort tasks should collect data on the participant’s level of understand and comfort with the task, as well as gather behavioral data, such as time to complete the task,

problem-solving methods, types of questions asked about the task, in order to assess the validity of the data obtained from the sorting tasks.

Another important issue to be addressed in content validity studies is the selection of items to be included in the stimulus sample or Q-sample (Sireci, 1998; McKeown & Thomas, 1988). The current studies used a large stimulus sample (203 items in Study I; 192 items in Study II). The use of large stimulus sets is discouraged when using MDS to analyze the data, as a large number of stimuli may make it difficult to identify the underlying structure of the measure (Sireci, 1998). However, this concern does not appear to be an issue in the MDS analysis in Study I, as a solution was clearly obtained. However, the use of a large stimulus set in Study I did preclude the consecutive collection of item-relevance ratings as an external validation of the MDS solution.

The issue of the large number of items in the stimulus sets does increase the possibility of fatigue, frustration or boredom on the part of participants. The design of the studies attempted to limit the impact of fatigue by designing the sorting tasks to last no more than an hour and to maintain participant's motivation by providing monetary compensation. However, while on average these approaches may have limited the impact of fatigue, frustration and boredom among participants, some participants may have struggled with the demands of the tasks, which may have negatively impacted their performance.

Despite these limitations the findings in this study provide important information about the impact of alcohol use on late-adolescent functioning. The utilization of late-adolescents as content "experts" of the impact of alcohol-use on functioning, sheds new light on how and what to measure in an alcohol-specific level of functioning measure.

However, this study is only the first step in the development of the Relationship with Alcohol Scale for Late-Adolescents. The following section will discuss the future directions in the development of the RAS.

Future Directions

The current study is the first step in establishing the content validity of the Relationship with Alcohol Scale for Late-Adolescents. Further study of the items content and psychometric properties of the RAS is required before the measure can be used in clinical or research settings.

Item Selection

Further study of the item content of the RAS, is necessary in order to establish content validity. Specifically, the simple sorting study (Study I) and item relevance study (Study II) should be conducted with a clinical sample of late-adolescents. The replication of Studies I and II with a clinical sample of late-adolescents would address the concern that the current studies utilized a non-clinical population and thus the content domains and items may not reflect the full impacts of alcohol use on level of functioning. Additionally, the current studies utilized late-adolescents as “experts” for determining the content validity of the RAS. Traditionally, content validity is established by using content experts from the field; in the case of the RAS, experts on adolescent alcohol use behavior. Replication of Studies I and II is also necessary with a sample of experts in the field of adolescent alcohol use behavior, will be necessary to provide additional evidence for the content validity of the RAS and additionally, conform to traditional methods of establishing content validity.

After establishment of the content validity of the RAS through the

replication of Studies I and II with a clinical sample and content expert sample, the next step in the development of the RAS is to conduct a field study of the RAS items with a large sample of late-adolescents. It is recommended that Item Response Theory (IRT) be used for item selection process. IRT is a psychometric approach to test development which states that an individual's response to a given test item is influenced by qualities of the item (i.e., item difficulty) and qualities of the individual (i.e., trait level; Furr & Bacharach, 2008). Thus, item-response curves can be derived for each item of the RAS, which represent late-adolescent's responses to an item as a function of their alcohol use. These item-response curves, can then be used to identify the items which best identify alcohol specific level of functioning across all levels of alcohol use behavior (Bolt & Rounds, 2000).

Psychometric Properties

Once the item selection process is complete, evidence of reliability and validity of the RAS will need to be established. The current studies attempted to provide initial content validity of the RAS. Additional studies will need to be conducted to establish criterion-related validity, convergent/discriminant validity and construct validity. Additionally, evidence of reliability will need to be established. Studies investigating internal consistency will be particularly important, as other methods of establishing reliability, such as test-retest reliability, may not be appropriate for the RAS, as alcohol-specific level of functioning may fluctuate as a function of alcohol use, which during late-adolescence is episodic in nature (Lucey, 2009).

Conclusion

In conclusion, the purpose of this study was to determine the content domains of the Relationship Alcohol Scale, by empirically identifying a set of items of late-adolescent alcohol use involvement which were relevant to the content domain. The results of this study identified 6 content domains representing 4 level of functioning domains, 2 alcohol use behavior and consequences domains and a total of 147 items. The current studies provide initial evidence for the content validity of the RAS. The strength of the RAS is in its biopsychosocial framework for understanding the complex impact of alcohol use on late-adolescent functioning, its use of late-adolescents as content “experts” to identify salient content domains to be includes in the measure and the use of empirical methods to determine the content domains and item relevance. This study is only the first step in the development of the RAS. Further studies will need to be conducted to further reduce the number of items in the RAS and to evaluate the psychometric properties of the measure.

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APPENDIX A

Item Statements for Study I Organized by Hypothesized Domain

1. Psychological/Emotional Well-Being

I was jealous of my spouse/partner.

I was irritable.

I was critical of others.

I was unforgiving of others.

I felt calm.

I felt afraid.

I felt secure.

I felt happy.

I felt optimistic.

I felt agitated, restless, or couldn't sit still.

I felt hopeless.

I felt sad, blue, or depressed.

I thought about harming myself.

I thought about killing myself.

My mood changed quickly.

I felt like hurting other people.

I found it hard to concentrate on my work.

I hurt myself on purpose.

I couldn't get certain thoughts out of my mind.

I felt compelled to perform certain behaviors.

I had difficulty controlling my behavior.

I had difficulty controlling my emotions.

I felt nervous, fidgety, tense or anxious.

I was easily frustrated.

I felt confused.

I had difficulty solving problems.

Nothing was fun for me.

I blamed others for my problems.

I preferred to be alone.

I could not focus.

When I was sober, I regretted the things I said or did while drinking.

I forgot conversations I had with others.

I forgot commitments I had made.

I am satisfied with my life.

I felt bad/guilty about a "hook-up" the next day after drinking.

2. Behaviors Promoting Well-Being

I moved due to financial or other problems resulting from my drinking.

I lived with others who drank alcohol.

I spent most of my money on alcohol.

I missed 2 or more meals a day.

I didn't eat right.
 I did not bathe.
 I did not brush my teeth.
 I did not wear clean clothes.
 I did not take medication I was prescribed on schedule.
 I neglected household duties.
 I did not have enough money to pay my bills.
 I had to borrow money from others.
 I spent little time on my personal hygiene.
 I did not clean my house.
 I attended AA.
 I was in inpatient alcohol treatment.
 I was in outpatient alcohol treatment.
 I had to move back home with my parents.
 I put things off the day after drinking.
 I participated in after school activities.
 I took part in activities outside of school or work. (adol)
 I have interests outside of school or work.

3. Interpersonal Functioning

I experienced problems with other people.
 I experienced problems with a significant other.
 I argued with other people.
 I refused to obey my parents. (adol)
 I avoided my family.
 I avoided my friends.
 I avoided people who did not drink.
 I had no or very few friends other than those with whom I drank.
 I spent time with a boyfriend, girlfriend or significant other.
 I felt comfortable being around others who did not drink.
 I threatened other people.
 I yelled or screamed at others for no reason.
 I argued with people.
 I insulted people.
 I failed to help family members when they needed it.
 I took part in family activities.
 I missed important family events.
 I was loud in social gatherings.
 I made lewd or sexually suggestive remarks to others.
 I argued with my boss or coworkers.
 I hung out with people I thought would not mind my drinking.
 I helped my friends when they needed it.
 I did not get along with my parents.
 I pressured others I was with to drink.
 My drinking created problems between me and my parents.

I did not keep social appointments I had made.
 My girlfriend, boyfriend or significant other drank regularly.
 My friends drank regularly.
 Getting together with friends usually included drinking alcohol.
 My parents used alcohol regularly.
 I hung out with older people who bought me alcohol.
 I have had unprotected sex while using alcohol.
 I have “hooked-up” with someone while drinking.
 I was bothered if people asked me personal questions.
 I depended on others to help me get home.
 I was unable to tolerate criticism.
 I lied to my boyfriend/girlfriend about my drinking.
 I needed alcohol in order to talk to others.
 Drinking alcohol helped me make friends.
 I count on others to tell me what happened while I was drinking the night before.
 I lied to my parents about where I was.
 I have lost friends because of my drinking.
 My relationship with a boyfriend/girlfriend ended because of my drinking.

4. School

I was failing at least one class at school.
 I did not do my schoolwork.
 I was late for school.
 I was absent from school.
 My school work was poorly done.
 I missed deadlines for assignments.
 My classmates complained about my behavior.
 I neglected my schoolwork for a day or more due to my drinking.
 My grades dropped.
 I was placed on academic probation or suspension.
 I did not attend school because of my drinking.
 I failed to meet my school obligations.
 I had to transfer to a different school.
 I dropped out of school.
 I failed out of school.
 I did not attend my morning classes.
 I did not attend my afternoon classes on Fridays.

5. Work

I was absent from work due to my drinking.
 I did not keep work appointments I had made.
 I was absent from work on Mondays, Fridays, or days following holidays.
 I was absent from work following a payday.
 My work was of low quality or poorly done.
 I missed work deadlines.
 My co-workers or supervisor complained about my performance / behavior.

I neglected my work for a day or more because I was drinking.
 I was late for work.
 I drank on the job or before working.
 I could not work.
 I called in sick to work because of my drinking.
 I left work early because of my drinking.
 I went to work hungover.
 I went to work still intoxicated from the night before.

6. Behavior Organized Around Alcohol Use

I spent time trying to get something to drink.
 When I drank, I did so at regular times of the week or weekend.
 I worried I would run out of alcohol on weekends.
 I made sure I didn't run out of alcohol on weekends.
 I worried that alcohol would not be served at a party or a social event.
 I hid alcohol around the house, apartment or dorm room so I would have it when I needed it.
 I hid alcohol around the house, apartment or dorm room, so others wouldn't know how much I was drinking.
 I bought alcohol at different places so no one would know how much I drank.
 I would buy enough alcohol to make sure I had it when I needed it.
 I switched from one type of drink to another while drinking.
 I only drank out of a certain glass when I was drinking.
 I avoided drinking "hard liquor" when I go out drinking.
 I hid alcohol in different places where it was easily accessible.
 I tried to hide my drinking from others.
 I told lies about my drinking.
 I planned when I was going to drink.
 I tried to cover up the smell of alcohol on my breath.
 I snuck alcohol from my parents or others refrigerator or liquor cabinet
 I asked people over the age of 21 to buy me alcohol.
 I snuck back into the house after drinking so my parents wouldn't find out.
 I set aside money to buy alcohol.

7. Decision-Making About Alcohol Use

I drank more than I intended.
 I drank longer than I intended.
 I drank in a place or at a time when it was dangerous to do so.
 I drank more than the other people I was with.
 I drank during the day.
 I drank for more than 12 hours at a time.
 I drank before noon.
 Once I started drinking, it was hard to stop.
 I arrived to social gatherings intoxicated.
 I drank to feel normal.
 I pre-gamed before going to a sporting event, party or the bars.

I drank alcohol in order to get drunk.
 I drank more than I should have.
 When I was not drinking, I wanted to be.
 I felt I'd lost control of my drinking.
 I had to drink a lot in order to feel drunk.

8. Violation of Other's Rights

I destroyed property belonging to others while intoxicated.
 I took things that didn't belong to me while intoxicated.
 I hit or injured someone in a fight while intoxicated.
 I used a weapon in a fight while intoxicated.
 I sexually assaulted someone while intoxicated.
 I got into physical fights with others.
 I hit, slapped, kicked or threw things at others.

9. Legal-Financial Problems

I was ticketed for underage drinking.
 I drove when I was drunk.
 I was arrested because of my drinking.
 I had an accident while driving under the influence.
 I was arrested for public intoxication.
 I spent time in jail because of my drinking.
 I got in trouble with the police because of my drinking.
 I used a fake ID to buy alcohol or get into a bar.
 I moved due to financial or other problems resulting from my drinking.
 I spent most of my money on alcohol.
 I did not have enough money to pay my bills.
 I had to borrow money from others.
 I set aside money to buy alcohol.
 I had to move back home with my parents.

10. Physical Effects of Alcohol

After drinking I had a hangover or a headache.
 I had problems performing sexually.
 I wasn't interested in sex.
 I had trouble falling asleep and/or staying asleep.
 I had a hard time feeling pain.
 I vomited.
 I had trouble controlling my bladder.
 I had trouble controlling my bowels.
 I felt I was overweight.
 I vomited blood.
 I went to the emergency room.
 I was hospitalized.
 I continued to drink even though it affected my health.
 When I talked, people had a hard time understanding me.

I had difficulty understanding other people when they talked to me.
I didn't remember things I did or said while I was drinking.
I was hurt or injured in a fight while intoxicated.
I felt weak all over.
I didn't feel like going out or doing anything.
I felt I just couldn't get going.
I stayed in bed or on the couch all day.
I had difficulty controlling my hands.
I had difficulty controlling my movements.
I had indigestion or stomach problems due to my drinking..

APPENDIX B

Background Information Form

ID # _____

Age (in years): _____

Gender: ___Female ___Male ___Transgendered

Race/Ethnicity: ___African-American
 ___Asian-American
 ___Native-American
 ___European-American
 ___Latino/Latina
Other: _____

APPENDIX C

Domain Definitions and Domain Content for Study II

Social Role Performance**Domain Definition**

The impact of alcohol use on a young person's ability to meet the demands of being a student and employee.

Domain Content

I found it hard to concentrate on my work.
 I argued with my boss or coworkers.
 I was failing at least one class at school.
 I did not do my schoolwork.
 I was late for school.
 I was absent from school.
 My school work was poorly done.
 I missed deadlines for assignments.
 My classmates complained about my behavior.
 I neglected my schoolwork for a day or more due to my drinking.
 My grades dropped.
 I was placed on academic probation or suspension.
 I did not attend school because of my drinking.
 I failed to meet my school obligations.
 I had to transfer to a different school.
 I dropped out of school.
 I failed out of school.
 I did not attend my morning classes.
 I did not attend my afternoon classes on Fridays.
 I was absent from work due to my drinking.
 I did not keep work appointments I had made.
 I was absent from work on Mondays, Fridays, or days following
 I was absent from work following a payday.
 My work was of low quality or poorly done.
 I missed work deadlines.
 My co-workers or supervisor complained about my performance / behavior.
 I neglected my work for a day or more because I was drinking.
 I was late for work.
 I drank on the job or before working.
 I could not work.
 I called in sick to work because of my drinking.
 I left work early because of my drinking.
 I went to work hungover.
 I went to work still intoxicated from the night before.

Psychological Well-Being-Psychological Distress

Domain Definition

The engagement in activities that make a young person feel good physically, emotionally and psychologically, as well as the negative impact of alcohol use on a young person's emotions/feelings.

Domain Content

I was irritable.
 I felt afraid.
 I felt calm.
 I felt secure.
 I felt happy.
 I felt optimistic.
 I felt agitated, restless, or couldn't sit still.
 I felt hopeless.
 I felt sad, blue, or depressed.
 I thought about harming myself.
 I thought about killing myself.
 My mood changed quickly.
 I couldn't get certain thoughts out of my mind.
 I had difficulty controlling my behavior.
 I had difficulty controlling my emotions.
 I felt nervous, fidgety, tense or anxious.
 I was easily frustrated.
 I felt confused.
 I had difficulty solving problems.
 Nothing was fun for me.
 I preferred to be alone.
 I could not focus.
 When I was sober, I regretted the things I said or did while drinking.
 I am satisfied with my life.
 I took part in activities outside of school or work.
 I have interests outside of school or work.
 I spent time with a boyfriend, girlfriend or significant other.
 I felt comfortable being around others who did not drink.
 I took part in family activities.
 I helped my friends when they needed it.
 I didn't feel like going out or doing anything.
 I felt I just couldn't get going.

Personal Health & Hygiene

Domain Definition

The impact of alcohol use on a young person's ability to take care of their personal appearance, living areas and overall health, as well as the negative physical effects of alcohol intoxication.

Domain Content

I hurt myself on purpose.
 I missed 2 or more meals a day.
 I didn't eat right.
 I did not bathe.
 I did not brush my teeth.
 I did not wear clean clothes.
 I did not take medication I was prescribed on schedule.
 I neglected household duties.
 I spent little time on my personal hygiene.
 I did not clean my house.
 After drinking I had a hangover or a headache.
 I had trouble falling asleep and/or staying asleep.
 I vomited.
 I had trouble controlling my bladder.
 I had trouble controlling my bowels.
 I vomited blood.
 I went to the emergency room.
 I was hospitalized.
 I continued to drink even though it affected my health.
 I didn't remember things I did or said while I was drinking.
 I stayed in bed or on the couch all day.
 I had difficulty controlling my hands.
 I had difficulty controlling my movements.
 I had indigestion or stomach problems due to my drinking.

Alcohol Use Behavior

Domain Definition

Behaviors related to planning, hiding, obtaining and drinking alcohol.

Domain Content

I hung out with older people who bought me alcohol.
 I spent time trying to get something to drink.
 When I drank, I did so at regular times of the week or weekend.
 I worried I would run out of alcohol on weekends.
 I made sure I didn't run out of alcohol on weekends.
 I worried that alcohol would not be served at a party or a social event.
 I hid alcohol around the house, apartment or dorm room so I would have it
 I hid alcohol around the house, apartment or dorm room, so others wouldn't know how much I was drinking.
 I bought alcohol at different places so no one would know how much I drank.

I would buy enough alcohol to make sure I had it when I needed it.
 I switched from one type of drink to another while drinking.
 I hid alcohol in different places where it was easily accessible.
 I tried to hide my drinking from others.
 I planned when I was going to drink.
 I tried to cover up the smell of alcohol on my breath.
 I snuck alcohol from my parents or others refrigerator or liquor cabinet
 I asked people over the age of 21 to buy me alcohol.
 I snuck back into the house after drinking so my parents wouldn't find out.
 I drank more than I intended.
 I drank longer than I intended.
 I drank in a place or at a time when it was dangerous to do so.
 I drank during the day.
 I drank for more than 12 hours at a time.
 I drank before noon.
 Once I started drinking, it was hard to stop.
 I drank to feel normal.
 I drank alcohol in order to get drunk.
 I drank more than I should have.
 When I was not drinking, I wanted to be.
 I felt I'd lost control of my drinking.
 I had to drink a lot in order to feel drunk.
 I used a fake ID to buy alcohol or get into a bar.

Interpersonal Functioning

Domain Definition

The impact of alcohol use on how a young person treats and interacts with people, including: boyfriends/girlfriends/significant others, parents and family; friends; and people in the community.

Domain Content

I was jealous of my spouse/partner.
 I was critical of others.
 I was unforgiving of others.
 I felt like hurting other people.
 I blamed others for my problems.
 I forgot conversations I had with others.
 I forgot commitments I had made.
 I lived with others who drank alcohol.
 I had to move back home with my parents.
 I experienced problems with other people.
 I experienced problems with a significant other.
 I argued with other people.
 I refused to obey my parents.

I avoided my family.
 I avoided my friends.
 I avoided people who did not drink.
 I had no or very few friends other than those with whom I drank.
 I threatened other people.
 I yelled or screamed at others for no reason.
 I argued with people.
 I insulted people.
 I failed to help family members when they needed it.
 I missed important family events.
 I was loud in social gatherings.
 I hung out with people I thought would not mind my drinking.
 I did not get along with my parents.
 I pressured others I was with to drink.
 My drinking created problems between me and my parents.
 I did not keep social appointments I had made.
 My friends drank regularly.
 Getting together with friends usually included drinking alcohol.
 My parents used alcohol regularly.
 I have had unprotected sex while using alcohol.
 I have "hooked-up" with someone while drinking.
 I was bothered if people asked me personal questions.
 I depended on others to help me get home.
 I lied to my boyfriend/girlfriend about my drinking.
 I needed alcohol in order to talk to others.
 I count on others to tell me what happened while I was drinking the night before.
 I lied to my parents about where I was.
 I have lost friends because of my drinking.
 My relationship with a boyfriend/girlfriend ended because of my drinking.
 I drank more than the other people I was with.
 I arrived to social gatherings intoxicated.
 I pre-gamed before going to a sporting event, party or the bars.
 I destroyed property belonging to others while intoxicated.
 I took things that didn't belong to me while intoxicated.
 I hit or injured someone in a fight while intoxicated.
 I used a weapon in a fight while intoxicated.
 I sexually assaulted someone while intoxicated.
 I got into physical fights with others.
 I hit, slapped, kicked or threw things at others.
 I had problems performing sexually.
 I wasn't interested in sex.
 When I talked, people had a hard time understanding me.
 I had difficulty understanding other people when they talked to me.

I was hurt or injured in a fight while intoxicated.
 Drinking alcohol helped me make friends.

Legal-Financial Problems

Domain Definition

Involvement with the police or the legal system because of a young person's alcohol use, as well as having money problems because of a young person's alcohol use.

Domain Content

I moved due to financial or other problems resulting from my drinking.
 I spent most of my money on alcohol.
 I did not have enough money to pay my bills.
 I had to borrow money from others.
 I set aside money to buy alcohol.
 I was ticketed for underage drinking.
 I drove when I was drunk.
 I was arrested because of my drinking.
 I had an accident while driving under the influence.
 I was arrested for public intoxication.
 I spent time in jail because of my drinking.
 I got in trouble with the police because of my drinking.

APPENDIX E

Schematic of Q-sort Continuum

