

PSYCHOMETRIC PROPERTIES OF ANXIETY SENSITIVITY INDEX-REVISED  
AND THE RELATIONSHIP WITH DRINKING MOTIVES AND ALCOHOL USE  
IN TURKISH UNIVERSITY STUDENTS AND PATIENTS

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Approval of the Graduate School of Social Sciences

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## **ABSTRACT**

### **PSYCHOMETRIC PROPERTIES OF ANXIETY SENSITIVITY INDEX-REVISED AND THE RELATIONSHIP WITH DRINKING MOTIVES AND ALCOHOL USE IN TURKISH UNIVERSITY STUDENTS AND PATIENTS**

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Anxiety Sensitivity (AS) consists of beliefs that the experience of anxiety symptoms leads to illness or additional anxiety. The aim of the present study was to examine the factor structure of the Turkish version of Anxiety Sensitivity Index–Revised (ASI-R), and to investigate associations among AS, alcohol use and drinking motives in university students and alcohol dependent inpatients. The participants were 411 university students (225 females and 186 males) and 55 (3 females and 52 males) alcohol dependent inpatients. All participants were administered ASI-R, State-Trait Anxiety Inventory-Trait Form, Beck Depression Inventory, Drinking Motives Questionnaire-Revised, and Demographic Information Form. Exploratory factor analyses revealed four lower order factors of the ASI-R: (1) fear of respiratory symptoms; (2) fear of cardiovascular symptoms; (3) fear of cognitive dyscontrol; and (4) fear of publicly observable anxiety symptoms. ANOVA revealed that the

frequency and amount of alcohol use were significantly higher in male students than females. Males reported more alcohol use for Coping and Conformity Motives than did females. Regression analyses revealed that only “fear of cognitive dyscontrol” significantly predicted hazardous alcohol use of students. Coping Motives significantly predicted alcohol use after controlling the effects of demographics, depression and ASI-R lower order factors in students using alcohol. “Fear of publicly observable anxiety symptoms” significantly predicted frequency of alcohol use in students using alcohol. Students reported using alcohol mostly for Enhancement, Social, Coping, and Conformity Motives, respectively. Students with high AS reported more alcohol use for Coping, Social and Conformity Motives than those with moderate and low AS. “Fear of cognitive dyscontrol” and “fear of publicly observable anxiety symptoms” explained a significant variance of drinking motives in students. In alcohol dependent inpatients, only “fear of respiratory symptoms” had a significant correlation with Coping Motives. Patients reported having used alcohol mostly for Coping, Enhancement, Social, and Conformity Motives, respectively. Coping and Enhancement Motives were significantly correlated with alcohol use. Results were discussed within the findings in the literature.

Keywords: Anxiety Sensitivity, Anxiety Sensitivity Index-Revised, Alcohol Use, Drinking Motives.

## ÖZ

### KAYGI DUYARLILIĞI ÖLÇEĞİ-DÜZELTİLMİŞ FORMU'NUN PSİKOMETRİK ÖZELLİKLERİ VE TÜRK ÜNİVERSİTE ÖĞRENCİLERİ VE HASTA GRUBUNDA İÇME NEDENLERİ VE ALKOL KULLANIMI İLE İLİŞKİSİ

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Kaygı duyarlılığı (KD) kişinin yaşayacağı kaygı belirtilerinin hastalanmaya ya da daha fazla kaygıya neden olacağı inancını içerir. Bu çalışmanın amacı Kaygı Duyarlılığı İndeksi-Düzeltilmiş'in (KDİ-D) Türkçe Formu'nun faktör yapısını belirlemek ve üniversite öğrencileri ve alkol bağımlısı yatan hastalarda KD, alkol kullanımı ve içme nedenleri arasındaki ilişkileri incelemektir. Araştırmaya 411 üniversite öğrencisi (225 kadın ve 186 erkek) ile 55 alkol bağımlısı yatan hasta (3 kadın ve 52 erkek) katılmıştır. Katılımcılara KDİ-D Formu, Sürekli Kaygı Envanteri, Beck Depresyon Envanteri, Alkol Kullanım Bozuklukları Tanıma Testi, İçme Nedenleri Anketi-Düzeltilmiş Formu ve Demografik Bilgi Formu uygulanmıştır. Açıklayıcı faktör analizi sonucunda KDİ-D'nin dört alt faktörü olduğu bulunmuştur: (1) solunum ile ilgili belirtilerden korkma; (2) kalp-damar hastalıkları ile ilgili belirtilerden korkma; (3) bilişsel kontrolü kaybetmekten korkma; (4) sosyal ortamlarda fark edilebilen kaygı belirtilerinden korkma. ANOVA sonucunda, erkek

öğrencilerin alkol kullanma sıklığının ve miktarının kız öğrencilere göre daha fazla olduğu ve erkek öğrencilerin kız öğrencilere göre daha fazla başa çıkma ve uyum sağlama nedeniyle alkol kullandıkları bulunmuştur. Regresyon analizleri, “bilişsel kontrolü kaybetmekten korkma” faktörünün öğrencilerin tehlikeli alkol kullanımını anlamlı olarak yordadığını göstermiştir. Demografik değişkenler, depresyon ve KD'nin etkileri çıkarıldıktan sonra, başa çıkma içme nedeninin öğrencilerin alkol kullanımını anlamlı şekilde yordadığı bulunmuştur, “sosyal ortamlarda fark edilebilen kaygı belirtilerinden korkma” faktörünün ise öğrencilerin alkol kullanma sıklığını anlamlı şekilde yordadığı bulunmuştur. Alkol kullanan tüm öğrencilerin sırasıyla eğlenme, sosyalleşme, başa çıkma ve uyum sağlama nedeniyle alkol kullandıkları gösterilmiştir. Yüksek KD olan öğrencilerin orta ve düşük KD olanlara göre başa çıkma, uyum sağlama ve sosyalleşme içme nedenleri açısından daha yüksek puan aldığı gözlenmiştir. “Bilişsel kontrolü kaybetmekten korkma” ve “sosyal ortamlarda fark edilebilen kaygı belirtilerinden korkma” faktörlerinin öğrencilerin içme nedenlerini anlamlı şekilde yordadığı bulunmuştur. Alkol bağımlılığı olan hastalarda sadece “solunum ile ilgili belirtilerden korkma” ile başa çıkma içme nedeni arasında anlamlı bir korelasyon olduğu bulunmuştur. Hastaların sırasıyla başa çıkma, eğlenme, sosyalleşme ve uyum sağlama nedeniyle alkol kullandıkları bulunmuştur. Başa çıkma ve eğlenme içme nedenleri alkol kullanımı ile anlamlı korelasyon göstermiştir. Çalışmanın sonuçları literatürdeki bulgular bağlamında tartışılmıştır.

Anahtar Kelimeler: Kaygı Duyarlılığı, Kaygı Duyarlılığı İndeksi-Düzeltilmiş Formu, Alkol Kullanımı, İçme Nedenleri.

To my father, mother and sister

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## TABLE OF CONTENTS

PLAGIARISM .....	iii
ABSTRACT .....	iv
ÖZ .....	vi
DEDICATION .....	viii
ACKNOWLEDGEMENTS .....	ix
TABLE OF CONTENTS .....	xi
LIST OF TABLES .....	xv
CHAPTER	
1. INTRODUCTION.....	1
1.1    What is Anxiety Sensitivity?.....	1
1.2    Anxiety Sensitivity and Trait Anxiety .....	3
1.3    Factors Affecting Anxiety Sensitivity.....	7
1.3.1.Genetic Factors .....	7
1.3.2.Contribution of Learning Experiences .....	10
1.3.3.Anxiety Sensitivity and Gender .....	14
1.4. Measurement of Anxiety Sensitivity.....	15
1.5. Anxiety Sensitivity and Psychological Disorders .....	21
1.5.1.Anxiety Sensitivity and Anxiety Disorders .....	21
1.5.2.Anxiety Sensitivity and Depression .....	25

1.6. Anxiety Sensitivity and Substance and Alcohol Use.....	27
1.6.1. Anxiety Sensitivity, Substance Use and Smoking.....	27
1.6.2. Anxiety Sensitivity and Alcohol Use.....	29
1.6.2.1. Four Factor Motivational Model of Alcohol Use and Drinking Motives.....	34
1.6.2.2. Anxiety Sensitivity and Drinking Motives .....	40
1.7. Purpose of the Present Study .....	45
1.8. Hypotheses of the Study .....	46
 2. METHOD.....	 49
2.1. Participants.....	49
2.1.1. University Students .....	49
2.1.2. Alcohol Dependent Inpatients.....	49
2.2. Materials.....	50
2.2.1. Anxiety Sensitivity Index-Revised (ASI-R) .....	50
2.2.2. State-Trait Anxiety Inventory-Trait Form (STAI-T).....	52
2.2.3. Beck Depression Inventory (BDI) .....	52
2.2.4. Alcohol Use Disorders Identification Test (AUDIT) .....	53
2.2.5. Drinking Motives Questionnaire-Revised (DMQ-R).....	54
2.3. Procedure .....	56
2.3.1. University Students .....	56
2.3.2. Alcohol Dependent Inpatients.....	56
2.4. Data Analysis .....	57
 3. RESULTS .....	 59

3.1. Factor Structure, Validity and Reliability of the ASI-R .....	59
3.1.1. Factor Structure of the ASI-R .....	59
3.1.2. Convergent and Divergent Validity of the ASI-R.....	63
3.1.3. Reliability of the ASIR .....	65
3.2. Relationship among Alcohol Use, Anxiety Sensitivity and Drinking Motives in University Students Using Alcohol .....	65
3.2.1. Descriptive Statistics of Self-Reported Measures by Gender .....	66
3.2.2. Anxiety Sensitivity and Alcohol Use.....	68
3.2.3. Anxiety Sensitivity as a Predictor of Alcohol Use .....	69
3.2.4. Anxiety Sensitivity and Coping Motives as Predictors of Alcohol Use....	76
3.2.5. Alcohol Use, Anxiety Sensitivity and Drinking Motives .....	83
3.2.6. Anxiety Sensitivity as a Predictor of Drinking Motives.....	87
3.3. Relationship among Alcohol Use, Anxiety Sensitivity and Drinking Motives in Alcohol Dependent Inpatients .....	94
3.3.1. Anxiety Sensitivity, Alcohol Use and Drinking Motives .....	95
3.3.2. Drinking Motives .....	98
4. DISCUSSION .....	100
4.1. Factor Structure, Validity and Reliability of the ASI-R .....	100
4.2. Relationship among Alcohol Use, Anxiety Sensitivity and Drinking Motives in University Students Using Alcohol .....	105
4.2.1. Gender Differences on Self Reported Measures.....	105
4.2.2. Anxiety Sensitivity and Alcohol Use.....	109
4.2.3. Anxiety Sensitivity and Coping Motives as Predictors of Alcohol Use .	113

4.2.4. Alcohol Use, Anxiety Sensitivity and Drinking Motives .....	115
4.3. Relationship among Alcohol Use, Anxiety Sensitivity and Drinking Motives in Alcohol Dependent Inpatients .....	122
4.3.1. Anxiety Sensitivity, Alcohol Use and Drinking Motives .....	122
4.3.2. Drinking Motives .....	124
4.4. General Discussion and Conclusions .....	128
4.5. Limitations of the Present Study .....	130
4.6. Clinical Implications .....	133
4.7. Directions for Future Research .....	134
REFERENCES .....	136
APPENDICES .....	151
APPENDIX A: Anxiety Sensitivity Index-Revised .....	152
APPENDIX B: State-Trait Anxiety Inventory-Trait Form .....	155
APPENDIX C: Beck Depression Inventory .....	157
APPENDIX D: Alcohol Use Disorders Identification Test .....	160
APPENDIX E: Drinking Motives Questionnaire-Revised .....	162

## LIST OF TABLES

Table 1 Factor Loadings and Communalities ( $h^2$ ) for the Four Factor Solution of the PCA and PAF after Oblique Rotation.....	61
Table 2 Pearson Correlation Coefficients among ASI-R, ASI-R factors, STAI-T and BDI in University Students .....	64
Table 3 Descriptive Statistics of Self-reported Measures by Gender in University Students.....	67
Table 4 Drinking Behavior Scores as a function of AS group.....	69
Table 5 Variables in each step for Hierarchical Multiple Regressions using demographics and ASI-R lower order factors to predict aspects of Drinking Behavior .....	70
Table 6 Zero-order Correlations among Predictor (demographics and ASI-R lower order factors) and Criterion (drinking behavior measures) Variables .....	71
Table 7 Summary of Hierarchical Multiple Regressions using demographics and ASI-R lower order factors to predict aspects of Drinking Behavior.....	74
Table 8 Variables in each step for Hierarchical Multiple Regressions using demographics, BDI, ASI-R lower order factors AND Coping Motives to predict aspects of Drinking Behavior.....	76
Table 9 Zero-order Correlations among Predictor (demographics, BDI, ASI-R lower order factors and Coping Motives) and Criterion (drinking behavior measures) Variables .....	79

Table 10 Summary of Hierarchical Multiple Regressions using demographics, BDI, ASI-R lower order factors and Coping Motives to predict aspects of Drinking Behavior .....	81
Table 11 Descriptive Statistics of Drinking Motives Scores of University Students Using Alcohol .....	84
Table 12 Comparison of Drinking Motives Scores as a function of AS group .....	86
Table 13 Variables in each step for Hierarchical Multiple Regressions using demographics, AUDIT's two subscales and ASI-R lower order factors to predict Drinking Motives .....	87
Table 14 Zero-order Correlations among Predictor (demographics, AUDIT's two subscales and ASI-R lower order factors) and Criterion (drinking motives) Variables .....	88
Table 15 Summary of Hierarchical Multiple Regressions using demographics, AUDIT's two subscale scores, and ASI-R lower order factors to predict Drinking Motives .....	92
Table 16 Descriptive Statistics of Self-reported Measures in Alcohol Dependent Inpatients .....	94
Table 17 Zero-order Correlations among demographics, ASI-R lower order factors, Drinking Behavior Measures and Drinking Motives in Alcohol Dependent Inpatients .....	97
Table 18 Descriptive Statistics of Drinking Motives scores of Alcohol Dependent Inpatients .....	99

## **CHAPTER I**

### **INTRODUCTION**

#### **1. 1. What is Anxiety Sensitivity?**

Anxiety sensitivity (AS) is defined as “a cognitive individual difference variable consisting of beliefs that the experience of anxiety / fear causes illness, embarrassment or additional anxiety” (Reiss, Peterson, Gursky, & McNally, 1986, pp. 1-2). Reiss (1991) described AS as a “fear of fear” or “fear of anxiety”. People with high AS are more likely to believe that anxiety-related symptoms (e.g., fainting, trembling) have harmful somatic, social or psychological consequences as compared to people with low AS. Therefore, people with high AS usually avoid situations which lead to anxiety-related sensations. On the other hand, people with low AS think that anxiety symptoms are unpleasant but harmless (Reiss, 1991).

In 1940’s, AS and related concepts have been considered in theoretical perspectives. However, theoretical and clinical significance of AS was recognized after the development of cognitive theories of panic attack, anxiety and anxiety-related disorders (Taylor, 1995). In 1985, Reiss and McNally proposed an expectancy model of fear. They developed this theory to explain how and why AS could cause fear, anxiety, panic, and avoidance behavior. Hence, the expectancy theory provided an important theoretical context for AS.

According to the expectancy theory, “expectations” (what one thinks will happen when the feared object is encountered, e.g., “I expect to have a panic attack

during flight”) and “sensitivities” (why one is afraid of the anticipated event, e.g., “Panic attacks cause heart attacks”) theoretically provide the basis of human fears (Reiss, 1991). Additionally, the expectancy theory made the distinction between common (ordinary) fears and fundamental fears. Common fears are, for instance, fears of harmless animals, fears of heights. However, fundamental fears are fears of stimuli that are inherently aversive for most people (Reiss, 1991). Indeed, according to Reiss (1991) fundamental fears give rise to fearing a broad range of stimuli, while common fears do not. He posited that fear acquisition is a function of three fundamental fears (sensitivities): (1) injury / illness sensitivity; (2) fear of negative evaluation; and (3) anxiety sensitivity. He proposed that fundamental fears might exacerbate many common fears. For example, a person might be afraid of snakes (common fear) if the person is frightened about feeling anxious (AS).

Taylor (1998) proposed that AS is a stable personality trait which exists in all persons, varying among individuals by degree. Individual differences in AS arise from a variety of sources including social learning experiences, history of panic attacks, need to avoid social embarrassment or illness and physiological overreactivity (Reiss et al., 1986). AS has been shown to be associated with anxiety disorders, (Reiss, 1991; Zinbarg, Barlow, & Brown, 1997; Taylor, Koch, & McNally, 1992) particularly panic attacks (Schmidt, Lerew, & Jackson, 1997; Norton et al., 1997), and alcohol / drug use (Stewart, Samoluk, & McDonald, 1999; Karp, 1993).

Little is known concerning AS’s relation to the broader personality domain. Yet, some psychometric research has shown that AS is a subcomponent of a higher order factor commonly referred to as neuroticism or negative affectivity (e.g., Rapee & Medoro, 1994). Studies (i.e., Arrindell, 1993; Zinbarg & Barlow, 1996; Cox,

Borger, Taylor, Fuentes, & Ross, 1999), that have examined the relation of AS measures to dimensions of Big Three and Big Five, have usually found that measures of AS were significantly correlated with the higher order dimension of Negative Emotionality (or in Eysenck's scheme, Neuroticism), which reflects a tendency to experience aversive emotional states of all kinds. Similarly, Lilienfeld (1997), too, demonstrated that AS is positively associated with a higher order psychological factor of negative emotionality but is unrelated to either positive emotionality or constraint.

The Anxiety Sensitivity Index (ASI) (Reiss et al., 1986) is the most frequently used scale to assess AS. Taylor (1996) suggested that the ASI has a multifactorial structure consisting of at least three lower order factors. The items of ASI assess broadly three domains: fear of somatic sensations (physical concern), fear of cognitive sensations (psychological concern), and fear of publicly observable sensations (social concern).

## **1. 2. Anxiety Sensitivity and Trait Anxiety**

In AS literature, there is a debate about whether AS and trait anxiety are identical or different concepts. When the construct of AS was first put forward, Reiss et al. (1986) explained the distinction between AS and trait anxiety (frequency and intensity of past anxiety experiences) by stating "it may be more important to know what the person thinks will happen as a result of becoming anxious than how often the person actually experiences anxiety" (p. 1). McNally (1989) illustrated the difference between AS and trait anxiety by defining trait anxiety as a general tendency to respond fearfully to stressors, while AS as a specific tendency to respond

fearfully to one's own anxiety symptoms. It is suggested that trait anxiety cannot explain why some people react with anxiety to their own anxiety or anxiety related sensations (Donnell & McNally, 1990). In addition, McNally (1996) suggested that a person could be theoretically high in trait anxiety but low in AS, and vice versa. Indeed, Cox, Endler and Swinson (1991) obtained empirical evidence that some individuals possess high AS but low trait anxiety, and vice-versa.

Some studies found empirical evidence that AS frequently is not independent of other forms of anxiety such as trait anxiety (i.e., Cox, Endler, Norton, & Swinson, 1991; Lilienfeld, 1996). However, much more evidence indicated that AS and trait anxiety are different personality traits (i.e., McNally, 1989; Reiss et al., 1986; Taylor, 1996). Taylor, Koch and Crockett (1991) found the Anxiety Sensitivity Index (ASI) to be factorially distinct from State Trait Anxiety Inventory-Trait Form (STAI-T). Moreover, the ASI and STAI-T are only moderately correlated. Hence, they concluded that the ASI and STAI-T are measures of different constructs. Rapee and Medoro (1994) again found that there was a significant but modest ( $r = 0.31$ ) correlation between the ASI and STAI-T. Furthermore, Reiss (1991) and McNally (1990) pointed out that correlations between the ASI and trait anxiety have been consistently lower than the correlations between trait and state anxiety. Taylor and Cox (1998a) found a modest correlation ( $r = 0.26$ ) between trait version of STAI and 60 item-Anxiety Sensitivity Profile which is a revised form of the ASI, and concluded that AS and trait anxiety are correlated but distinct factors.

Similarly, Sandin, Chorot and McNally (2001) have investigated the association between the ASI and STAI-T by subjecting the items of both scales to factor analysis. Results yielded two different factors with the first factor that can be

described as a trait anxiety factor, and the second as an anxiety sensitivity factor. Thus, their results supported the hypothesis that the ASI and STAI-T are measuring different constructs.

Another line of research has demonstrated that the ASI has incremental validity above and beyond trait anxiety measures in the prediction of fear and panic i.e., Taylor, 1995a; Taylor, 1995b). For example, Muris, Schmidt, Merckelbach and Schouten (2001) found that in a sample of adolescents, AS accounted for significant proportion of variance in anxiety disorder symptoms, even when trait anxiety levels were controlled. These findings supported AS's construct validity and they indicated that AS and trait anxiety are different constructs.

The construct of AS has been criticized by Lilienfeld et al. (1989, 1993, 1996) who have reported various versions of criticisms on this issue. The main point made by Lilienfeld, Jacob and Turner (1989) is that AS is simply trait anxiety. They argued that neither the AS nor the ASI has been adequately distinguished from trait anxiety and STAI-T. They even suggested that AS should be eliminated from the field of research.

Lilienfeld, Turner and Jacob (1993) later argued that AS effects can be accounted for by trait anxiety in numerous studies using the ASI. Lilienfeld et al. (1993) noted the evidence that patients with panic disorder and other anxiety disorders have also elevated trait anxiety. From this point, they criticized studies which found high levels of AS in patients with panic disorder and other anxiety disorders and argued that high AS in these patients can be an effect of trait anxiety. Therefore, they suggested that research on AS should definitely explore the ASI's

incremental validity relative to trait anxiety measures in examining AS's association with panic disorder and other anxiety disorders.

Lilienfeld et al. (1993) further noted that trait anxiety influences the extent to which ambiguous stimuli are interpreted as threatening. Thus, they asserted that trait anxiety, rather than AS, does explain why some individuals perceive their own anxiety experiences to be more threatening than others. They also argued that the findings of AS studies using anxiety-provoking procedures (e.g., inhalation of CO<sub>2</sub>, hyperventilation) (i.e., Donnell & McNally, 1989) could also be explained by trait anxiety. They claimed that people might manifest high state anxiety to challenge procedures as a result of high trait anxiety. Thus, they criticized AS studies using challenge procedures for proposing AS as the sole explanation leading to high state anxiety following challenge.

Yet, in their final discussion of AS-trait anxiety debate, considering substantial amount of empirical support for AS, Lilienfeld et al. (1996) have conceded AS's construct validity and acknowledged that AS research cannot be explained entirely by trait anxiety. However, they proposed a hierarchical factor model of AS and trait anxiety in which AS is a facet of trait anxiety. They claimed that AS is a lower-order factor of a higher order dimension of trait anxiety which is a lower order factor of another higher order dimension of neuroticism (negative affectivity). They also suggested that several lower-order factors within the AS construct also exist.

In response to criticisms of Lilienfeld et al. (1989, 1993, 1996), Reiss (1997) explained theoretical and conceptual differences between the AS and trait anxiety and put forward that AS and trait anxiety are different in the sense that they use

different indicators to predict future anxiety or fear. Reiss (1997) noted that while trait anxiety predicts future anxiety based on anxiety experiences in the past, AS predicts future anxiety based on the beliefs assessed by the ASI, regardless of the frequency of anxiety experiences in the past. Furthermore, Reiss (1991) has evaluated the correlation between AS and trait anxiety in 11 different studies. He reported that the overlapping variance ( $r^2$ ) between AS and trait anxiety ranges between 0 and 36%. Reiss (1997) concluded that AS is related to but distinct from trait anxiety.

In response to AS-trait anxiety debate, hierarchical theories have emerged which explained both the shared variance and the unique contribution of AS in anxious responding (Zinbarg & Barlow, 1996; Zinbarg et al., 1997). The existent research has both supported the distinction between the AS and trait anxiety and argued against such a distinction. The current and widely accepted conceptualization of hierarchical model integrates both of the perspectives and viewed AS as being both a distinct construct and a lower-order factor of trait anxiety. McNally (1996) has concluded that AS is an individual difference variable that is empirically and conceptually distinct from trait anxiety. From the research findings thus far a consensus emerged that AS and trait anxiety are different constructs.

### **1. 3. Factors Affecting Anxiety Sensitivity**

#### **1. 3. 1. Genetic Factors**

In fact, the literature on AS is profoundly lacking studies of the origins of AS. The expectancy theory posits AS to be acquired through learning and / or influenced by genetic factors (Reiss & McNally, 1985). With respect to genetic influences,

Reiss and McNally (1985) proposed that people who are highly autonomically reactive might develop greater concerns about becoming anxious than less reactive people.

Stein, Jang and Livesley (1999) examined the heritability of AS by carrying out a twin study. They examined ASI scores of monozygotic and dizygotic twin pairs to find out whether AS might be inherited. They found that AS had a strong heritable component. Their results revealed that approximately 45% that is nearly half of the variance in AS could be accounted for by genetic factors. Since over half of the variance (additional 55%) in AS levels was attributable to environmental influences, Stein et al.'s (1999) study also indicated the importance of the parental role of childhood learning experiences in the development of elevated AS. Additive genetic effects and unique environmental events influence the development of AS. Thus, Stein et al.'s (1999) study supported both the genetic and environmental (learning) experiences on the acquisition of high levels of AS.

Studies have proposed that if AS has a hereditary component and is linked to the vulnerability to panic disorder, first degree relatives of panic disorder patients might have higher AS levels than normals. In such a study Van Beek and Griez (2003) examined whether healthy first-degree relatives of panic disorder patients are more anxiety sensitive than healthy controls (normals). Their results revealed that first-degree relatives scored higher on AS than controls, but lower than panic disorder patients. Thus, this study indicated that AS runs in families. Conversely, in a recent study Van Beek, Perna, Schruers, Muris and Griez (2005) investigated AS levels in children of parents with panic disorder and they found that children of parents with panic disorder do not have higher levels of AS than children of healthy

parents. Moreover, they found no relationship between AS levels of parents with panic disorder and their children. They concluded that since children of panic disorder do not display higher levels of AS compared to those of healthy parents, AS may manifest itself towards late adolescence or early adulthood. Manuzza et al. (2002) carried out a similar study and they again found that there were no differences in AS levels of children of parents with panic disorder, other anxiety disorders and no disorders.

Although Van Beek and Griez (2003) stated that it might be tempting to make an association between carbon-dioxide (CO<sub>2</sub>) vulnerability and high AS, some authors proposed that increased AS may explain high vulnerability to biological challenges (i.e., Forsyth, Palav, & Duff, 1999). In a study including panic disorder patients and nonclinical controls, Shipherd, Beck and Ohtake (2001) examined the relationship between the ASI and responses to administration of CO<sub>2</sub>. They found that AS levels predict responses to a CO<sub>2</sub> challenge in panic disorder patients and control participants. Specifically, high levels of AS are associated with more anxiety, respiratory changes and more intense symptom reports following CO<sub>2</sub> challenge. Other studies using nonclinical samples also showed that individuals with high levels of AS reported greater subjective distress in response to inhalation of low doses of CO<sub>2</sub> than subjects with low levels of AS (McNally & Eke, 1996; Forsyth et al., 1999). In this aspect, there is some preliminary evidence supporting an association between AS and CO<sub>2</sub> vulnerability.

To conclude, it is assumed that at least a sizeable proportion of the variance in AS is likely to be genetically determined. However, little is known about how the genetic factors operate.

### **1. 3. 2. Contribution of Learning Experiences**

Taylor and Cox (1998a) proposed that childhood learning experiences may affect the development of high AS. They argued that for example how much someone learns about the dangerousness of cardiac symptoms might influence one's fear of those sensations. Furthermore, Taylor (2000) hypothesized that specific types of learning experiences influence beliefs associated with specific dimensions of AS; for example fear of somatic sensations could be influenced by being exposed to parental instruction about the dangerousness of these sensations or by witnessing how the parents react when they themselves experience somatic sensations. Likewise, fear of cognitive dyscontrol could be influenced by observing parental cognitive dyscontrol or receiving parental instruction that feeling 'spaced out' (depersonalization) or derealization is a sign of insanity. Fear of publicly observable anxiety reactions could arise from experiences of being ridiculed for blushing or trembling. Taylor (2000) added that recurrent, intense arousal-related sensations may increase the person's beliefs about the dangerousness of the sensations, particularly if the person is not given an adequate explanation of the real causes of the sensations. Specific learning experiences during childhood may affect AS in adolescence. For instance, an intense panic attack experience in childhood may be cognitively misinterpreted as harmful or dangerous and contribute to high levels of AS (Stewart et al., 2001).

Research that has examined the role of learning experiences in the development of AS has focused on three primary learning mechanisms: (1) classical conditioning, (2) instrumental conditioning, and (3) vicarious conditioning. With respect to classical conditioning, it has been speculated that if bodily arousal

sensations, such as heart palpitations (CS), are paired with a frightening event, such as an unexpected panic attack, (UCS), then a person might make the association between CS and UCS and learn to fear (CR) the bodily arousal sensations in the future (Forsyth, Eifert, & Thombson, 1996). However, Donnell and McNally (1990), in a study of 425 college students, examined whether high AS occurs in the absence of a history of unpredictable panic attacks and their results contradicted with this classical conditioning position. They found that two-thirds of the high AS students had never experienced a panic attack. Hence, they argued that the fear of anxiety, that is AS, can be acquired in ways other than through direct experience with panic (e.g., verbal transmission of misinformation).

According to instrumental conditioning model, if a child's anxiety symptoms are rewarded in some way, such as being allowed to miss school (negative reinforcement) or being paid special attention (positive reinforcement), it might contribute to the development of high AS. On the other hand, if a parent discourages his / her child's fear of anxiety symptoms (i.e., punishment), the child would probably suppress the symptoms in the future, which might contribute to lower AS levels (Watt, Stewart, & Cox, 1998).

Vicarious conditioning could contribute the development of high AS if a child modeled his or her parents by observing their fear reactions to their own anxiety symptoms and / or if the parents verbally transmit their beliefs about the harmfulness of these symptoms to the child (Watt et al., 1998). In line with this assumption, Donnell and McNally (1990) found that a family history of panic was associated with high AS levels among their student sample, indicating that high AS may develop as a

result of children being exposed to parental models who have exhibited fear responses to their own anxiety experiences.

Watt et al. (1998) studied the relationship between early learning experiences and the development of AS in a nonclinical university student sample. They found that parental reinforcement of sick role behavior in response to both childhood anxiety symptoms and childhood cold symptoms, observation of parents' uncontrolled behavior, and observation of parental sick role behavior in response to parents' own anxiety symptoms predicted overall AS. Results also revealed that high AS individuals retrospectively reported more childhood instrumental and vicarious conditioning experiences involving somatic symptoms compared to those with lower AS. They also found that exposure to uncontrolled parental behaviors due to drunkenness and anger was related to the development of high AS. It is also indicated that the learning experiences of high AS individuals were not to be specific to anxiety symptoms, but involved somatic symptoms in general.

Stewart et al. (2001) examined the relations between childhood learning experiences (instrumental and vicarious) and AS in young adults using retrospective self-reports and structural equation modeling. The reported learning experiences were found to have a direct effect on participants' AS levels. Not only childhood learning experiences for arousal-reactive sensations (e.g., dizziness, rapid heart beat) but also arousal non-reactive sensations (e.g., colds, pains) directly influenced AS. MacPherson, Stewart and McWilliams (2001), in a sample of university students, investigated whether high levels of AS and its lower order components were associated with childhood exposure to parental alcohol problems. Results revealed that exposure to parental problem drinking was significantly associated with AS

psychological and physical concerns, but not social concerns. Furthermore, AS psychological concerns has been found to be a mediator of the relationship between parental problem drinking and both general anxiety and panic-related anxiety symptoms in the offspring.

More recently, Watt and Stewart (2003) carried out a retrospective study and examined the relationship between childhood exposure to parental dyscontrol as a learning experience and levels of AS components and anxiety symptoms in early adulthood. They found that exposure to parental dyscontrol (i.e., loss of control behaviors due to drunkenness, anger or other negative emotional states) was significantly and positively correlated with all three AS dimensions (psychological, social and physical concerns). However, exposure to parental dyscontrol related to drinking was significantly positively correlated with only psychological concerns dimension of AS. Hence, researchers of this study concluded that frequent exposure to uncontrolled behavior due to parental drinking might lead to fears of loss of control in the offspring. Results also showed that AS psychological concerns plays a significant mediating role between parental dyscontrol related to anger and drinking and both general and panic-related anxiety symptoms in the adult offspring.

Scher and Stein (2003) proposed that other than the traditional learning theory perspectives, Bowlby's (1969/1982; cited in Scher & Stein, 2003) attachment theory may also be a framework for explaining the development of AS. They asserted that Bowlby's ideas about specific caregiver behaviors which leads to anxiety and depression may also contribute to the development of AS. Thus, parallel to Bowlby's ideas, they hypothesized that mother-child attachment relationships influence the development of AS. Scher and Stein (2003) examined the role of parental

threatening, hostile, and rejecting behavior in the development of AS based on their conceptualization of AS. They found that exposure to parental threatening, hostile and rejecting behaviors predicted overall AS, but parental threatening behaviors have the strongest relationship to AS. Specifically, parental threatening behaviors predicted fear of publicly observable anxiety symptoms, whereas parental hostile and rejecting behaviors predicted fear of losing control.

From the research carried out so far, there appears to be substantial support that parents may pass AS to their children either via genetic pathway or via observational learning and hence both genetic influences and learning experiences do contribute to the development of AS.

### **1. 3. 3. Anxiety Sensitivity and Gender**

Little research has investigated the relationship between AS and gender. Moreover, findings have been inconsistent regarding sex differences in ASI scores. Reiss et al. (1986), Peterson and Heilbronner (1987), Peterson and Plehn (1999) and Stewart, Karp, Pihl and Peterson (1997) found that female university students have significantly higher average levels of AS than male university students. However, Cox et al. (1991) found that females and males do not significantly differ from each other on the ASI scores, but they noted that females were significantly more likely to report panic attacks. Messenger and Shean (1998) again found no gender differences on the ASI.

There are also studies which found significant gender differences in the dimensions of AS. For instance, in a study by Stewart, Taylor and Baker (1997), females scored higher than males only on the physical concerns factor, females

scored higher on the physical concerns factor relative to their scores on the social and psychological concerns factor. Results also revealed that males score higher on the social and psychological concerns factors relative to their scores on the physical concerns factor. Finally, on the total ASI scores, females scored higher than males. Stewart et al. (1997) explained the differences between males and females on various AS dimensions in ways consistent with sex role socialization practices. For instance, they explained males' relatively greater level of concern with social and psychological consequences of anxiety symptoms by the socialization that they learn at an early age that it is not acceptable for them to lose control or to display anxiety in public. Thus, males tend to have higher scores in these two subscales rather than their scores in physical concerns factor. Furthermore, many studies have shown that females report greater fears of anxiety experiences, overall, on the ASI than males (Peterson & Reiss, 1992).

#### **1. 4. Measurement of Anxiety Sensitivity**

One of the most widely used measures of AS is the Anxiety Sensitivity Index (ASI) developed by Reiss et al. (1986). It is a 16-item self-report measure and participants rate the degree of agreement with each of the statements on a 5-point Likert-type scale (Taylor, 1995). The ASI is widely used in clinical area to assess anxiety disorders and has been translated and normed in a variety of cultures. The norms are stable across cultures for both clinical and nonclinical groups (Reiss, 1991). Studies with college students and clinical populations have shown that the ASI has sound psychometric properties including evidence of its high internal consistency, high test-retest reliability, criterion-related validity in distinguishing

patients with anxiety disorders from controls, and construct validity as a measure of fear of fear as distinct from trait anxiety (Taylor, 1995).

However, there has been considerable debate on the factor structure of the ASI, whether it has a multifactorial or a single factor solution. Studies found quite inconsistent results; some supported a single factor solution (Reiss et al., 1986; Taylor et al., 1991; Taylor, Koch, McNally, & Crockett, 1992; Sandin, Chorot, & McNally, 1996), whereas some reported a multidimensional solution (Cox, Parker, & Swinson, 1996; Telch, Shermis, & Lucas, 1989a). Expectancy theory conceptualized AS as a unifactorial construct (Reiss et al., 1986). Peterson and Heilbronner (1987) obtained a four-factor solution for the ASI with factors: (a) fear of cognitive symptoms associated with anxiety; (b) perceived importance of controlling the public display of symptoms associated with anxiety; (c) fear of cardiopulmonary and gastrointestinal sensations; (d) fear of trembling and fainting. However, they cautioned that the ASI is best represented by a single factor because there were few salient loadings for each factor which makes their solution unreliable. Hence, they concluded that the ASI is unifactorial.

Telch et al. (1989a) and Wardle, Ahmad and Hayward (1990) again found a four-factor solution for the ASI. Similarly, Ayvaşık (2000) found a four-factor solution for the Turkish version of the ASI. However, she concluded that a single-factor solution better fitted the data. Although there are some similarities among the four-factor solutions, there are also notable differences. Telch et al.'s (1989a) study found a different four-factor solution than that of Peterson and Heilbronner (1987) and Wardle et al. (1990). Additionally, Wardle et al. (1990) found markedly different four-factor solutions for agoraphobic and normal samples. Thus, it seems that the

four-factor solutions of the studies revealed inconsistent factor structures. Taylor (1995) posited that inconsistencies regarding factor analytic studies of the ASI might indicate that the ASI's factor structure may inherently be unstable or varies across populations such as university students and patients with different types of anxiety disorders.

Taylor et al. (1992) investigated the factor structure of the ASI with confirmatory factor analysis method by which they evaluate different models. They compared the single-factor solutions with four-factor solutions. Their results indicated that the ASI is unifactorial, rather than composed of multiple anxiety sensitivities. They concluded that the acceptance of a four-factor solution is neither empirically nor theoretically necessary. Afterwards in 1996, Taylor suggested that the ASI has a hierarchical multifactorial structure, consisting of at least three different lower-order factors, which are: (1) fear of somatic symptoms (physical concerns), (2) fear of cognitive dyscontrol (psychological concerns), (3) fear of publicly observable symptoms (social concerns). Some other studies including clinical and nonclinical samples have also demonstrated that the ASI is composed of at least three distinct, inter-correlated factors and one higher order factor (e.g., Cox, 1996; Zinbarg et al., 1997; Zinbarg, Mohlman, & Hong, 1999; Mohlman & Zinbarg, 2000). Essentially, the most replicable factor solutions for the ASI are three-factor solutions, with the lower-order AS components, physical, psychological and social concerns (e.g., McWilliams, Stewart, & McPherson, 2000; Stewart et al., 1997). On the other hand, there are also more recent studies which demonstrated that ASI has a two factor solution (Blais et al., 2001; Schmidt & Joiner, 2002; Cintron. et al., 2004). It seems that studies on the factor structure of the ASI yielded different results; some

studies confirming the unifactorial structure for the ASI and some studies supporting a multifactorial structure for the ASI. However, the most replicable factor solution seems to be three lower-order factors loading on one higher order factor.

Another controversy concerning the ASI is whether it measures a transitory state or a more stable personality trait. Reiss et al. (1986) found that ASI scores tend to be stable over a 2-week period. A longitudinal study by Maller and Reiss (1992) found evidence for the hypothesis of AS as a stable trait. This study found a 0.71 correlation between ASI scores in 1984 and ASI scores in 1987. This finding demonstrated that the stability of the ASI scores over a long period of time is in the 0.60 to 0.80 range, as reported for many other personality factors. Thus, research findings suggested that ASI is a highly stable measure of AS and this is consistent with the view that AS is a stable individual characteristic.

Although there is a debate in the literature on the factor structure of the ASI, high degree of internal reliability for the ASI constitutes important support for the psychometric soundness of the measure. Measured by Cronbach's alpha coefficient, Peterson and Heilbronner (1987) found the internal reliability at 0.88 and Telch et al. (1989a) found it as 0.80. These findings showed that various items on the ASI do belong together. Reiss et al. (1986), who developed the ASI, also examined the psychometric properties of the ASI. They found that test-retest reliability of the ASI over a two-week period range from 0.75 - 0.85.

Lilienfeld et al. (1993) criticized that AS literature is based on only a single measure of AS, namely the ASI. They suggested that AS, as a complex construct, consisting of several lower order factors, should not be assessed by a single measure. Taylor (1996) has stressed that ASI has only one item to assess fear of respiratory

symptoms which is insufficient to reliably define a factor. Afterwards, Taylor and Cox (1998b) posited that the ASI may not reliably assess all the important domains of AS, (e.g., fear of depersonalization). Therefore, Taylor and Cox (1998b) developed the Anxiety Sensitivity Index-Revised (ASI-R) which is based on an expanded measure of AS and consists of multiple dimensions. The ASI-R consists of 36 items with 6 subscales assessing each of the major domains of the AS. Taylor and Cox (1998b) examined the factor structure of the ASI-R in a sample of adult psychiatric outpatients. Results indicated a hierarchical structure with four lower-order factors loading on one higher order factor. The lower-order factors were (1) fear of respiratory symptoms, (2) fear of publicly observable anxiety reactions, (3) fear of cardiovascular symptoms, and (4) fear of cognitive dyscontrol. More recently, Deacon, Abramowitz, Woods and Tolin (2003) again found that the ASI-R has four lower-order factors which load on a single higher order factor. The lower-order factors were (1) beliefs about the harmful consequences of somatic sensations, (2) fear of publicly observable anxiety reactions, (3) fear of cognitive dyscontrol, (4) fear of somatic sensations without explicit consequences. On the other hand, Zvolensky and colleagues (2003) found that a two-factorial solution for the ASI-R was the most replicable across six different countries. The two factors were fear of somatic sensations and fear of social-cognitive concerns.

Another measure of AS is a 60-item Anxiety Sensitivity Profile (ASP) which was developed by Taylor and Cox (1998a). It contains six different dimensions and each dimension consists of 10 items. The subscales of the ASP were determined on the basis of the results of previous studies with the ASI (Taylor, 1996). Taylor and Cox (1998a) showed that the ASP has four lower order factors loaded on a single

higher order factor. The lower order factors were: (1) fear of respiratory symptoms, (2) fear of cognitive dyscontrol, (3) fear of gastrointestinal symptoms, and (4) fear of cardiac symptoms. These factors were similar to those obtained for the original ASI (Peterson & Reiss, 1992), and to factors obtained for the ASI-R (Taylor & Cox, 1998b). Ayvaşık and Tutarel-Kışlak (2004) provided evidence that the Turkish version of ASP has also four lower-order factors loaded on a higher order factor, and the lower-order factors were the same as found in Taylor and Cox's (1998a) study.

An index measuring AS in children and adolescents was also developed. Silverman, Fleisig, Rabian and Peterson (1991) developed the Childhood Anxiety Sensitivity Index (CASI) consisting of 18 items. Children respond to each item using a 3-point Likert-type scale (1 = 'none', 2 = 'some', or 3 = 'a lot'). Total scores range between 18 and 54. Silverman et al. (1991) reported coefficient  $\alpha$ s of 0.87 for both a nonclinical and clinical sample and test-retest reliability estimates of 0.76 and 0.79 for the nonclinical and clinical samples, respectively. Silverman, Ginsburg and Goedhart (1999) found that CASI has a hierarchical structure with three lower-order factors ("fear of physical symptoms", "fear of mental incapacitation" and "fear of social evaluation"). The CASI was found to exhibit good convergent and discriminant properties in relation to clinician-rated panic and generalized anxiety severity, respectively (Chorpita & Daleiden, 2000).

There are other measures of AS as well. Kenardy, Evans and Oei (1992) developed the Anxiety Symptoms and Beliefs Scale, which consists of a total of 21 items; 16 items assessing the intensity of anxiety-related sensations, including those that appear as DSM-III-R criteria for panic attacks, ("lightheadedness", "palpitations") and 5 items assessing feared consequences of panic or extreme

anxiety (“feelings of unreality”, “fears of losing control”). However, this scale is not used widely as the ASI, since it has too few items assessing fears of anxiety and dimensions of AS (Taylor, 1995).

Even though the dimensionality of AS has been still a controversial issue in the literature, there is substantial evidence that AS consists of at least three lower-order factors which load on a single higher order factor in child and adult samples, and in nonclinical and clinical samples (i.e., Muris et al., 2001; Zinbarg et al., 1997; Taylor & Cox, 1998a). The lower-order dimensions of AS are as follows: (1) somatic concerns (e.g., illness), (2) psychological concerns (e.g., insanity), and (3) social concerns (e.g., ridicule) (Taylor, 1995). Still, it appears that the measures of AS (i.e., ASI-R, ASP) need further factor analytic studies with normative and clinical populations for a better understanding of AS’s dimensions.

## **1. 5. Anxiety Sensitivity and Psychological Disorders**

### **1. 5. 1. Anxiety Sensitivity and Anxiety Disorders**

Reiss (1991) proposed that AS is a predisposing personality factor in the development of anxiety disorders. Consistent with this claim, research in adult, adolescent and child populations has obtained evidence for the notion that AS plays a significant role in the etiology and maintenance of anxiety disorders (e.g., Stewart, Knize, & Pihl, 1992; Taylor et al., 1992; Rabian, Peterson, Richters, & Jensen, 1993). Prior to the expectancy theory, many researchers viewed AS a secondary consequence of panic attacks (i.e., Goldstein & Chambless, 1978). However, expectancy theory holds that AS is not necessarily a consequence of panic attacks,

can precede panic attacks and may be a risk factor for anxiety disorders and panic attacks (Reiss, 1991).

There is empirical evidence that AS might serve as a vulnerability factor for the development of panic attacks and anxiety disorders (Maller & Reiss, 1992; Schmidt et al., 1997). Pollack et al. (1990) found that patients who reported a history of childhood anxiety disorders had significantly higher scores on the ASI in contrast to patients without such a history. In a small longitudinal study by Maller and Reiss (1992), high AS individuals drawn from the nonclinical population were found to develop anxiety disorders at higher rates (five times more likely) over a 3-year follow-up interval than low AS controls. AS levels of university students predicted the number, frequency and intensity of their panic attacks. Furthermore, in another study, AS was found to predict initial panic attacks in individuals with no prior history of panic (Ehlers, 1995). Schmidt et al. (1997) examined a large nonclinical sample of young adults over a 5-week basic military training. They found that high AS air force cadets were more likely to experience onset of panic attacks during a stressful period of basic training, compared to low AS cadets. It was further found that AS predicted the occurrence of unexpected panic attacks, even after controlling for trait anxiety and history of panic attacks. This finding indicated that AS predicts vulnerability to have panic attacks even in people who have never before had a panic attack. Dorward (1990) has reported higher ASI scores among college students with a history of panic attacks than those without a history of panic attacks.

Telch, Lucas and Nelson (1989b) administered the ASI and a measure of panic attack to a large sample of college students. Their results revealed that panickers had higher ASI scores than infrequent panickers and nonpanickers. In

another study, Asmundson and Norton (1993) administered the ASI to a sample of college students. Fifty-seven percent (57%) of high AS subjects reported a history of panic attacks (cued or unexpected), compared with 30% and 29% in the medium or low AS groups, respectively. In another study, Donnell and McNally (1990) found that 32.4% of 68 nonclinical subjects with high AS reported at least one spontaneous panic attack in the past year and low AS subjects rarely reported unpredictable panic. Cox and colleagues (1991) in their study included college students who experienced cued panic attacks as well as spontaneous panic attacks. They found that 50% of subjects with high AS reported panic attacks (expected or unexpected) in the past year, compared to 20% and 11% in the medium and low AS groups, respectively. However, Stewart, Knize, and Pihl (1992) found that the ASI failed to distinguish significantly between college students with a prior history of self-reported panic attacks versus students without a prior history of self-reported panic attacks. With this study, Stewart et al. (1992) posed some difficulties for the claim of the proponents of the expectancy theory that AS is a risk factor for the development of panic attacks.

The claim that high AS predicts vulnerability to have panic attacks has also been investigated in biological or psychological challenge studies. For instance, individuals with high ASI scores reported more intense panic symptoms following voluntary hyperventilation when compared with low ASI participants (Asmundson, Norton, Wilson, & Sandler, 1994). Rapee, Brown, Anthony and Barlow (1992) reported that in a combined sample of anxiety disorder patients and nonclinical control subjects the ASI was the best predictor of the degree of panic or fear in response to hyperventilation and carbon-dioxide (CO<sub>2</sub>) inhalation. In another study,

Messenger and Shean (1998) found that the ASI predicts response to mental (a mental arithmetic task) and physical (a balloon inflation task) stressors in nonclinical subjects. Subjects with high AS reported significantly more body sensations, anxious thoughts and subjective anxiety during the physical stressor task than subjects with low AS. Panic history and elevated ASI scores were found to be related, and two thirds of the panic subjects scored one standard deviation above the mean on the ASI. Additionally, subject with the highest ASI score reported the greatest number of physical symptoms experienced during a panic attack.

Several studies of clinical samples have shown that patients with panic disorder have higher ASI scores than healthy individuals and in general than patients with other anxiety disorders (e.g., Stewart et al., 1992; Taylor et al., 1992). For instance, Reiss et al. (1986) assessed AS on over 300 patients and over 1000 general population controls and found that the highest levels of AS tended to occur in people with panic disorder. Studies also have shown that panic disordered patients have higher AS levels than patients with obsessive-compulsive disorder (Zeitlin & McNally, 1993) and mixed samples of other anxiety disorders (Reiss et al., 1986; Taylor et al., 1991). There are also studies which found that reductions in panic disorder are accompanied by reductions in scores on the ASI (i.e., Shear et al., 1994). Telch et al. (1993) found that AS levels decrease with remission of panic psychopathology through cognitive behavioral therapy. Similarly, McNally and Lorenz (1987) found that the ASI scores of patients with panic disorder with agoraphobia decreased following cognitive behavioral treatment.

The claim that AS is more important than trait anxiety in characterizing panic disorder has been supported in a study by Taylor et al. (1991). They found that panic-

disordered patients were differentiated from patients with other anxiety disorders by the ASI total score, whereas the STAI-T scores were unable to differentiate panic disorder from other anxiety disorders. Furthermore, they found that the ASI items related to the fear of bodily sensations (physical concerns) are more characteristics of panic disorder patients compared with other anxiety disorders. On the other hand, Lilienfeld et al. (1993) argued that since many of the items on the ASI are relevant to panic symptoms, ASI's relation to panic disorder and related criteria may be due to this shared content rather than the AS construct. Moreover, they claimed that since there is evidence that individuals become hypersensitive to a wide range of physical sensations following panic attacks (Turner et al., 1988; cited in Lilienfeld et al., 1993), such individuals' high ASI scores might be due to this postpanic hypersensitivity.

Besides panic attacks, a small number of research demonstrated elevated AS levels in other anxiety disorders, such as generalized anxiety disorder (e.g., Sandin et al., 1996), obsessive-compulsive disorder (e.g., Sandin et al., 1996), and social phobia (Asmundson & Stein, 1994).

In sum, AS may serve as a risk factor for the development and maintenance of anxiety symptoms and anxiety disorders, especially panic attacks.

### **1. 5. 2. Anxiety Sensitivity and Depression**

Although the relationship between AS and anxiety disorders has been well documented, relatively little is known about the connection between AS and depression. A number of studies in adult populations (i.e., Otto, Pollack, Fava, Uccello, & Rosenbaum, 1995; Taylor, Koch, Woody, & McLean, 1996) have shown

that depressed patients have lower AS scores than patients with panic disorder, comparable scores to patients with other anxiety disorders, but clearly higher scores than healthy controls. Catanzaro (1993) found that an interaction between the ASI and a measure of negative mood regulation expectancy was a significant predictor of BDI scores, in addition to the main effects of each variable.

Otto et al. (1995) examined ASI scores in patients with major depression and found elevated ASI scores in the depressed patients, even in subjects without a comorbid anxiety disorder. They also found that ASI scores decreased following antidepressant treatment (fluoxetine) to levels comparable to control norms. Moreover, depressed patients with a comorbid anxiety disorder have been found to have even higher ASI scores. Asmundson, Norton and Veleso (1999) found that chronic pain patients with high AS reported greater depression than did patients with medium or low AS.

Furthermore, longitudinal research showed that ASI was predictive of greater depressive symptoms in nonclinical subjects (Schmidt, Lerew, Jackson, 1997, 1999). In a study examining children, Weems, Hammond-Laurence, Silverman and Ferguson (1997) found that there is a positive relationship between AS and depression in children. The authors concluded that the correlation between AS and depression remained significant even when levels of manifest (general) anxiety (i.e., worry, concentration, and physiological anxiety) partialled out. Muris (2002) again found a significant correlation between AS and childhood depression, even levels of trait anxiety were controlled.

Taylor et al. (1996) have proposed that the relationship between AS and depression is due to one specific dimension of AS, "fear of loss of cognitive control".

Supporting this argument, Taylor and Cox (1998a) found that the lower-order factor “fear of cognitive dyscontrol” of the ASI-R is highly correlated with depression.

Muris and colleagues (2001) examined the AS construct in a large sample of normal adolescents and found a significant correlation between AS and depression. However, when level of trait anxiety was controlled, this correlation clearly weakened and no longer reached statistical significance.

In reviewing the relationship between AS and depression, it seems that there is some evidence that proved a link between AS and depression. However, more research is needed to adequately disclose this relationship.

## **1. 6. Anxiety Sensitivity and Substance and Alcohol Use**

### **1. 6. 1. Anxiety Sensitivity, Substance Use and Smoking**

Although there is a substantial amount of evidence demonstrating the relationship between AS and alcohol use / abuse, far less is known about the relationship between AS and use of other substances.

In a study by Telch et al. (1989b) college students with high AS reported higher levels of use of medication for decreasing stress (including benzodiazepines) than the students with low AS. Asmundson and Norton (1995) demonstrated that AS levels have been found to be significantly positively associated with the regular use of analgesic medications among chronic pain patients. A positive association between elevated AS and benzodiazepine use was also reported in a study by Bruce (1996).

McNally (1996) proposed that high levels of AS, other than use and abuse of alcohol, should also be positively correlated with the use and abuse of anxiolytics

(e.g., benzodiazepines) or analgesics (e.g., heroine) and negatively correlated with the use and abuse anxiogenics or psychostimulants (e.g., cocaine, caffeine). Little research has addressed McNally's (1996) hypothesis.

Consistent with McNally's (1996) position regarding the association of AS and drug of choice, Norton et al. (1997) found that high AS substance abusers were more likely to indicate depressant drugs (i.e., benzodiazepines) as their drug of choice (52%) as compared with low AS substance abusers (32%). Substance abusers who had low AS levels were more likely to prefer marijuana.

Stewart et al. (1997) examined relations between AS and use of a variety of drugs among undergraduate students, and they found that users of marijuana or hashish scored significantly lower on the ASI than non-users. Thus, their finding supported a negative relation between AS and use of cannabis. Furthermore, they found that AS levels were positively correlated with the use of nicotine to cope with negative affect among female students. It was also found that self-reported smokers did not differ from nonsmokers in terms of overall ASI scores. Regarding the relation between AS and nicotine, Novak, Burgess, Clark, Zvolensky and Brown (2003) again found that ASI scores were not significantly related to rates of cigarette use among young adults. Yet, a number of research indicated that AS is positively correlated with nicotine use to reduce negative affect (Brown, Kahler, Zvolensky, Lejuez, & Ramsey, 2001; Novak et al., 2003; Stewart et al., 1997). Since nicotine does have both stimulant and depressant effects depending on the smoking situation (Pomerlau, Turk, & Fertig, 1984; cited in Stewart et al., 1999), the relationship between AS and nicotine seems to be ambiguous and difficult to test. In a study, in contrast to McNally's (1996) positions regarding relations between AS and drug of

choice, Forsyth, Parker and Finlay (2003) found no relationship between AS and drug of choice in a sample of substance abusers. McWilliams and Asmundson (2001) again did not find a significant negative association between AS and arousal-increasing substances- stimulants (nicotine and caffeine) in a sample of university students.

In summary, there is empirical evidence, though in a small number, demonstrating an association between AS and substance use / abuse, particularly use / abuse of central nervous system depressants (antianxiety drugs).

### **1. 6. 2. Anxiety Sensitivity and Alcohol Use**

The relationship between AS and heavier alcohol use has been well-documented in studies including both clinical and nonclinical samples. Early research demonstrated that people diagnosed with alcohol abuse and dependence have higher AS than nonclinical people (Peterson & Reiss, 1992). In a study using a clinical sample, Karp (1993) found that people diagnosed with DSM-III-R alcohol abuse or dependence (APA, 1987), whether or not with a comorbid anxiety disorder, are characterized by significantly high levels of AS when compared with nonclinical ASI norms. McNally (1996) also demonstrated that unusually high levels of AS is associated with the clinical diagnosis of alcohol dependence.

There is also research indicating an association between AS and alcohol use / abuse among nonclinical individuals. In such a study, Stewart (1995) examined the relationship between AS and alcohol use / abuse in nonclinical young adult women. She found that AS is an important predictor of self-reported rates of alcohol consumption in university women. Also, relatively high levels of AS have been

found among college students who report excessive drinking (Conrod, Stewart, & Pihl, 1997).

In a study including a nonclinical sample, Stewart, Peterson and Pihl (1995) examined the relationship between AS levels and self-reported rates of alcohol consumption and excessive drinking in a sample of nonalcoholic university women. Their results revealed that high AS women reported consuming significantly more alcoholic beverages on a weekly basis. Research also suggests that, even at a very young age, individuals with high AS are at elevated risk for problems with alcohol. For example, Conrod, Pihl and Vassileva (1998) examined self-reported drinking problems of nonclinical young males and obtained empirical evidence that those with high AS reported more drinking-related problems (i.e., social, physical, or occupational problem) than do those with low AS. In a recent study, Koven, Heller and Miller (2005) examined associations between AS dimensions and self-reports of problematic drinking. They found that only one AS dimension, fear of cognitive dyscontrol, was associated with self-reports of problematic drinking behaviors and attitudes. They also demonstrated that this association persists even after other variables' (e.g., trait anxiety and depression) effects were removed. Koven et al. (2005) also investigated possible role of depression in this relationship. However, depression did not contribute significant variance beyond the effects of fear of cognitive dyscontrol and other anxiety variables in predicting problematic drinking.

Some studies indicated high rates of comorbidity between alcohol abuse / dependence and the panic-related anxiety disorders (e.g., Cox, Norton, Swinson, & Endler, 1990). Essentially, panic disorder is an anxiety disorder that is frequently associated with alcohol abuse (e.g., Maier, Mingos, & Lichtermann, 1993). In this

aspect, AS was proposed to be a potential factor which underlies the high overlap between alcoholism and the panic-related disorders (Stewart et al., 1995). Parallel to this position, Cox, Swinson, Shulman, Kuch and Reichman (1993) found that self-reported weekly alcohol consumption rates may be significantly and positively correlated with the ASI scores in panic disorder patients.

One useful explanation for the association between AS and alcohol use / abuse is based on the tension reduction theory of alcohol use, that is individuals with high AS drink to relieve anxiety symptoms. McNally (1996) has suggested that people with high AS might be more likely to use depressants substances (e.g., alcohol) to reduce feelings of tension and anxiety, but not substances that increase arousal (e.g., cocaine). Consistent with McNally's (1996) hypothesis and tension reduction theory, Karp (1993) and Stewart et al. (1995) showed that high AS individuals use and abuse alcohol to decrease unwanted feelings of arousal. Also, Norton and his colleagues (1997) found that men, but not women, who were seeking treatment for substance abuse problems, and who have used alcohol as their substance of choice, have higher ASI scores than do those who preferred other chemicals such as marijuana. Additionally, laboratory-based studies provided support for the tension-reduction explanation for alcohol use / abuse and AS association. Stewart and Pihl (1994) and MacDonald, Baker, Stewart and Skinner (2000) in lab-based studies showed that high AS individuals reported greater levels of decrement in stress-response than low AS individuals, following alcohol administration.

DeHaas, Clamari, Bair and Martin (2001) examined the relationship between AS and alcohol or drug use in individuals with anxiety and substance use disorders.

They found that ASI scores were significantly correlated with substance use (i.e., alcohol) in negative situations (situations involving negative emotions) but not in positive situations (to enhance positive emotions or to increase satisfaction from interpersonal interactions). They also demonstrated that there were no differences in the relationship between AS and drinking in negative situations for participants with a dual diagnosis of substance abuse / dependence and an anxiety disorder and those with a diagnosis of only substance abuse / dependence. Hence, their finding refuted the position that the relationship between AS and substance abuse is simply the relationship between AS and anxiety disorders. They suggested that the relationship between AS and negative situations substance use is not simply secondary to having a comorbid anxiety disorder. Indeed empirical research indicates that high AS levels may be related to alcohol use disorders by means of their association with greater drinking levels and / or risky reasons for drinking (see Stewart et al., 1999). Other findings by DeHaas et al. (2001) showed that the relationship between AS and substance use is not secondary to relations of AS to trait anxiety or depression. They found that AS contributed additional variance to drinking in negative situations even after controlling for trait anxiety and depression. Essentially, McNally (1996) formerly proposed that the relationship between anxiety disorders and substance use disorders may be related to AS rather than trait anxiety.

Yet, there are also studies which did not find a significant relationship between AS and drinking behavior. In one of these studies, McWilliams and Asmundson (1999) examined the relationship between AS and drinking behavior in a sample of university students. They also investigated the interaction between AS and trait anxiety on alcohol consumption. They found that neither AS nor trait anxiety

accounted for significant variance in any of the drinking measures (average number of drinking occasions per week, average number of drinks consumed during a drinking occasion, average number of alcoholic drinks consumed per week and average frequency of intoxication per month). Merrill (2000) again found no relationship between the ASI scores and self-reported alcohol consumption in a sample of university students. Novak et al. (2003) showed that in a sample of nonclinical university students level of alcohol consumption was not related to AS but directly related to coping-related motives. Indeed Forsyth et al. (2003) concluded that, in AS literature findings about the relation between high AS scores and frequency of alcohol consumption to cope with negative affect (e.g., Stewart et al., 1995) are more robust than those of relation between AS and alcohol consumption.

In sum, research provided substantial amount of evidence on the positive relationship between AS and alcohol abuse / dependence, and that this relationship is independent of the trait anxiety and is not secondary to having a comorbid anxiety disorder. There is also preliminary evidence indicating a positive relationship between AS levels and both weekly alcohol consumption (Cox et al., 1993; Stewart et al., 1995) and yearly excessive drinking (Stewart et al., 1995) among nonclinical individuals. However, since there are also studies which failed to find such a relationship (Merrill, 2000; McWilliams & Asmundson, 1999; Novak et al., 2003), the relationship between AS and alcohol consumption should be replicated by other independent researchers.

### **1. 6. 2. 1. Four Factor Motivational Model of Alcohol Use and Drinking Motives**

Cox and Klinger (1988) developed a motivational model of alcohol use suggesting that a person's decision to drink or not drink is based on whether he or she expects the positive consequences of drinking to be greater than those associated with not drinking. This model acknowledges that factors such as a person's personality characteristics, biochemical reactivity to alcohol and sociocultural environment influence a person's past experiences with alcohol and the expectancies related to alcohol. According to the model, all these influences affect the individual's current motivation regarding alcohol drinking. This motivational model of alcohol use suggests that the decision to drink is a conscious and goal-directed process in which individuals choose to drink based on their expectation that drinking will have desired outcomes. Cox and Klinger (1988) described motivations for alcohol use along two dimensions: valence and source. The first dimension valence (positive vs. negative) states that people might consume alcohol because they desire to obtain a positive outcome (positive reinforcement) or because they want to avoid a negative outcome (negative reinforcement). The second dimension source (internal vs. external) points out that people might drink because they wish to obtain an internal reward (the manipulation of their own affective state), or because they hope to achieve an external reward like a social approval. Cooper (1994) crossed these two dimensions, 2x2 (Source x Valence), and proposed a categorical model of drinking motives, and four categories of drinking motives emerged: (1) internal positive reinforcement motives (drinking to enhance positive mood or well-being); (2) external positive reinforcement motives (drinking to obtain positive social rewards); (3) internal negative reinforcement motives (drinking to reduce or regulate negative

emotion); and (4) external negative reinforcement motives (drinking to avoid rejection).

Consistent with the drinking motives model, findings have shown that people differ in their reasons for drinking alcohol (Cooper, Russell, Skinner, & Windle, 1992; Stewart, Zeitlin, & Samoluk, 1996). Some drink to reduce or manage difficulties, some to enhance positive emotional experience, some to avoid rejection, and some to get social reward. Cooper et al. (1992) first described three drinking motives referred to as Social, Coping and Enhancement Motives. These three drinking motives have been found to be associated with different drinking patterns, drinking situations, and severities of alcohol-related problems. Afterwards, Cooper, Russell, Frone, and Mudar (1995) constructed four categories of drinking motives which they referred to as Social, Coping, Enhancement and Conformity Motives. Social Motives involve the use of alcohol to meet social norms in a given situation (e.g., drinking because it is customary on special occasions). Social Motives are found unrelated to heavy drinking, drinking-related problems and worries about controlling drinking (Cooper et al., 1992; Stewart & Divine, 2000). Coping Motive involves the use of alcohol to avoid or reduce negative affective states (e.g., drinking to relax or to forget one's worries). Coping-related drinking is more likely related to the tension-reduction and self-medication theories of alcohol use / abuse (Cappell & Greeley, 1987; cited in DeHaas et al., 2002). Furthermore, drinking primarily for Coping Motive has been shown to be associated with drinking alone, heavier alcohol consumption, preoccupation with drinking, worries about controlling drinking and more severe alcohol-related problems (i.e. abusive drinking) (Cooper et al., 1992). Enhancement Motive involves the use of alcohol to facilitate positive emotional

states and is strongly related drinking in response to urges and temptations (e.g., drinking because it is exciting) (Carrigan, Samoluk, & Stewart, 1998). Moreover, people who drink primarily to enhance positive affect are more likely to drink in social settings, particularly with same-sex friends (Cooper et al., 1992). High sensation seekers are likely to drink to enhance levels of stimulation (Cooper et al., 1995). Conformity Motive is associated with drinking in situations where pressures to conform may be particularly strong (e.g., peer pressure in parties).

The relationship between drinking motives and alcohol use tendency or pattern of people has been shown in several studies. Cooper (1994) suggested that Coping and Conformity Motives (negative reinforcement motives) directly predict drinking problems even after controlling for usual alcohol consumption. Stewart and Divine (2000) argued that Enhancement Motives are strongly related to heavy drinking situations, while Coping Motives have been found to predict the experience of drinking problems, even after controlling for level of alcohol consumption (Cooper, Russell, & George, 1988). Additionally, Cooper et al. (1992) found that only Coping Motives significantly predicted both social and occupational dysfunction, tolerance and withdrawal symptoms after controlling for usual alcohol consumption. Carpenter and Hasin (1999) also found an association between coping related drinking and alcohol use problems. DSM-IV diagnosed alcohol dependent drinkers demonstrated a greater level of drinking to cope with negative affect than non-diagnosed drinkers.

Studies indicate that drinking behavior in students was found to be most commonly associated with Social Motives (e.g., Thombs, Beck and Pleace, 1993b). These findings suggest that the use of alcohol to socialize or affiliate is much more

frequent among young adult university students than the use of alcohol to cope with negative emotional states. On the other hand, some other research suggests that coping with stress may be involved in alcohol use and alcohol use problems of at least some students (Sadava & Pak, 1993).

Brennan, Walfish and Aubuchon (1986a) reviewed eight studies on drinking motives and alcohol consumption among college students. Results showed that two types of drinking motives had great importance: drinking for social reasons and drinking for emotional relief. Carey and Correia (1997) examined the relationship between drinking motives and alcohol-related problems in undergraduate students. They found that drinking motives did contribute significantly to the prediction of drinking problems. Their results revealed no gender differences in drinking motives and no significant contribution of gender in the prediction of alcohol-related problems. They found that students who both drink heavily and experience problems as a result of doing so are more controlled by negative reinforcement than positive reinforcement motives for drinking. Carrigan et al. (1998) and Cooper et al. (1995) in their study showed that university students reported drinking more frequently in negatively reinforcing situations than in positively reinforcing or temptations situations.

Park and Levenson (2002) examined drinking to cope among a sample of 275 undergraduates in a cross-sectional sample. Their results showed that drinking to cope is very common among undergraduate students and is related to much higher levels of both negative and positive alcohol-related consequences. Their results also suggested that men rely on alcohol to cope more than women do. On the other hand, some research indicated that drinking to cope might be a more prevalent motive for

women than for men (Stewart et al., 2001; Thombs, Beck, & Mahoney, 1993a). Likewise, O’Haare and Sherrer (1999) found a stronger relationship between stress and problematic alcohol use in undergraduate women than in undergraduate men.

Kairouz, Glikman, Demers and Adlaf (2002) assessed reasons for drinking and situational alcohol use. They surveyed a sample of 8864 students in 18 universities. Their results showed that generally students drink for aesthetic reasons such as to enjoy the taste or to enhance meal (24.9%), and for social reasons as to celebrate (21.3%), to be sociable or polite (16.9%) and to a lesser extent to comply with others (6.0%). Authors of the study noted that social reasons are the main reasons for drinking for undergraduates, since in 63% of the situations, a social reason was given as the primary motivation for drinking in that situation. Compensatory reasons for drinking such as to relax (7.5%), to forget worries (2.1%) and to feel less shy (2.1%) are less common. They also found that men drink more than women for social reasons. Although studies (Stewart & Divine, 2000) indicated that Social Motives are unrelated to heavy drinking, some research (i.e., Carrigan et al., 1988) suggested that heavy drinking among university students is most likely to occur in positive social contexts. There are some studies which found gender differences on drinking motives. Lo (1995) found that men were more susceptible to peer influence in drinking behavior than were women. However, other studies reached the opposite conclusion that females are influenced more than males by drinking styles of peers because of the higher levels of sensitivity to environmental factors (Berkowitz & Perkins, 1986). Cooper et al. (1995) showed that in cross-gender comparison Coping Motives were more strongly related to drinking problems among men than women.

There is also research carried out in Turkey on the reasons of drinking of students, although most of them did not rely on a well-validated measure of drinking motives. Mangır, Aral and Boran (1992) studied the alcohol use among university students. Results revealed that 41.67% of female and 46.29% of male students used alcohol. Almost fifty seven percent of the students stated that they started to drink because it gives them a pleasant feeling. Furthermore, 30.53% of the students noted more peer influence on their drinking behavior than their family.

Delikaya (1999) surveyed students in five different schools in the center of Ankara to determine student attitudes regarding alcohol use. Among alcohol users, 68.4% of the students stated that they drink because it gives pleasure. Others (14.9%) stated that they use alcohol to forget their problems, and some others (12.1%) noted they use it out of curiosity. Tot et al. (2002) examined the prevalence of alcohol use among students of Mersin University. Of the total sample, 43% (females 15%, males 28%) reported alcohol use. Among users, 35% reported that they drink alcohol to forget their problems, 34% for the pleasant feelings it gives, 30% to pass time, 25% to fit in with peers, 19% to reduce tension, 17% out of curiosity, and 8.8% to sleep. In another study, including a clinical sample, Yıldız (1984) examined the effect of social factors in alcohol use. He examined 50 patients who were under alcohol treatment at Cerrahpaşa Medical Faculty, Psychiatry Clinic, and found that 50% of the alcoholic people started to use alcohol by modeling effects, 33% of them with peer pressure, and 7% of them to forget their worries. Özer, Eradamlar, Karamustafalıoğlu, Alpkan and Beyazyürek (1990) examined psychosocial characteristics of inpatients who were under alcohol treatment at AMATEM (Alcohol and Drug Treatment, Education and Research Center) at Bakırköy Neuro-

Psychiatric Hospital. A high rate of patients (44%) stated that they drink to be like others, to celebrate an occasion (16%), to conform to others (15%) and out of curiosity (14%).

Topuz's (2004) study assessed motives that underlie alcohol use among 1585 Turkish university undergraduate students by using a standardized measure of drinking motives, Drinking Motives Questionnaire- Revised (DMQ-R). She found that roundly 62% of the students used alcohol. Males drink more than females both in frequency and in amount. Furthermore, results indicated that for both gender, Enhancement was the first common motive, which was followed by Social, Coping and Conformity Motives. Hence, this study showed that university students drink generally for positive reinforcement reasons (Enhancement and Social Motives) than negative reinforcement reasons (Coping and Conformity Motives). Enhancement Motive was moderately related to the amount of drinking while relations with Social and Coping Motives were lower. She also found that drinking motives changed by level of academic progress, parental education, participation in social activities and perceived harm of alcohol. Drinking motives were significantly and positively related to the amount of alcohol consumed except for Conformity Motive for both gender. Males reported more alcohol consumption for Social, Coping, and Conformity Motives.

#### **1. 6. 2. 2. Anxiety Sensitivity and Drinking Motives**

Research indicates that there may be important relationships between AS and certain drinking motives. Indeed, the role of high AS in leading to the development

of alcohol use problems has been explained by coping-related drinking motives (Cooper, 1994).

In literature, one explanation regarding the relationship between AS and alcohol use was based on the tension reduction theory of alcohol use. McNally (1996) suggested that people drinking alcohol to reduce tension have not only frequent anxiety symptoms, but also fear of those symptoms (those with high AS). From this aspect, it can be argued that people with high AS, may be more likely to drink for coping reasons than do those with low AS. Consistent with tension reduction explanation about AS and alcohol use relationship, Stewart (1995) found that high AS university students are both more likely to report drinking alcohol primarily to cope with negative affective states, and less likely to report drinking alcohol primarily for social-affiliative motives, than are low AS university students. In a study by Stewart et al. (1997), university students were asked to indicate which of a list of items (all of which relate to Coping Motive) applied to their own motivations for alcohol use. Results revealed that scores on the Coping Motive questionnaire were found to be significantly positively correlated with levels of AS, and this effect was stronger in females than in males.

In another study, Stewart and Zeitlin (1995) examined the relationship between AS and alcohol use motives in a large sample of nonclinical university students. They found a significant positive association between ASI scores and Coping Motives subscale of the Drinking Motives Questionnaire (DMQ), particularly in the female subjects. However, ASI scores were not significantly associated with the Enhancement and Social Motives subscales of the DMQ. Results also showed that ASI and STAI-T scores each contribute to the prediction of

frequency of coping-related drinking and the effect was stronger in females than males. Furthermore, a weighted linear combination of scores on the ASI and STAI-T significantly predicted scores on the Coping Motive subscale of the DMQ. This prediction is more likely attributable to differences in AS, as opposed to trait anxiety. This finding suggested that the combination of high trait anxiety and high AS put individuals (particularly women) at increased risk for alcohol-related problems. With regard to primary motives, people with high AS were found to report more drinking to cope with negative affect than do those with low AS, while people with low AS report more social-affiliative motives for drinking than do those with high AS. Results of this study also showed that high AS subjects reported a higher overall frequency of drinking (independent of the type of drinking motive) than low AS subjects.

Stewart et al. (1997) found that high AS students were more likely to report drinking primarily for Coping Motives, and less likely to report drinking primarily for Social Motives (i.e., to affiliate with others) compared with low AS students. On the other hand, in a more recent study Forsyth et al. (2003) found no support that people with high AS use alcohol to relieve unwanted feelings of arousal.

In a study Samoluk and Stewart (1998) examined the typical drinking situations of high AS individuals in a large sample of university student drinkers. It has been found that there is a significant positive correlation between AS and drinking in negative affect situations (i.e., unpleasant emotions, conflict with others, physical discomfort) but not in positive affect situations (i.e., pleasant times with others, pleasant emotions). Similar to this study, Lawyer, Karg, Murphy and McGlynn (2002) examined the relationship between AS and situational antecedents

to heavy drinking among college students. The results showed that although AS is related to negatively reinforced drinking, positively reinforced drinking and temptation-motivated drinking, it is most strongly associated with only negatively reinforced drinking. They also found that the relation between AS and negatively reinforced drinking is stronger among men than among women. Thus, these findings supported that AS is uniquely associated with drinking in negatively reinforced situations and hence confirmed the notion that AS-alcohol consumption relationship is based on the tension reduction theory.

Kushner, Thuras, Abrams, Brekke and Stritar (2001) examined a mediator model in which anxiety symptoms mediate the association between AS and alcohol use in alcohol-dependent individuals. They hypothesized that AS promotes anxiety symptoms, which, in turn, promote alcohol use to cope with anxiety and other negative affective states. Their results revealed that AS influences coping-related drinking motives indirectly through its direct effect on anxiety symptoms. They found that syndrome-related anxiety symptoms and trait anxiety, but not state anxiety or withdrawal symptoms, mediated the significant association between AS and self-reported tendency to drink alcohol to control anxiety symptoms.

In another study, Stewart et al. (2001) examined whether drinking motives mediate the previously established relation between high AS and increased drinking behavior in college student drinkers. High AS students (especially high AS men) reported a higher yearly excessive drinking frequency than low AS students. Only the negative reinforcement motives of Coping and Conformity independently mediated the relations between AS and increased drinking behavior in the total sample. Lastly, as they expected, gender differences were found. High AS women's

greater drinking behavior was largely explained by their elevated Coping Motives, while high AS men's greater drinking behavior was largely explained by their elevated Conformity Motives.

Comeau, Stewart and Loba (2001) investigated effects of trait anxiety and AS on motivations for alcohol use among a sample of adolescents. They found that low AS predicted Enhancement Motives for alcohol use, whereas high AS predicted Conformity Motives for alcohol use. They argued that since alcohol has both negatively reinforcing anxiolytic effects and positively reinforcing stimulant effects, alcohol use for different motives may be due to different levels of AS. They also found that high trait anxiety predicted Coping Motives for alcohol use, replicating Stewart and Zeitlin's (1995) finding. Furthermore, they found that high AS moderated the relationship between trait anxiety and Coping Motives for alcohol use, that is the trait anxiety-Coping Motive relation was stronger for high than for low AS individuals. Hence, their findings supported the importance of AS in coping-motivated alcohol use through an interactive relation with trait anxiety. Novak and colleagues (2003) investigated the relationship among AS, alcohol use, and drinking motives in a nonclinical university population. They found that AS is directly related to coping-related drinking motives.

Lab-based alcohol administration studies (i.e., Samoluk, Stewart, Sweet, & MacDonald, 1999), in which subjects are administered alcohol in experimental settings, have indicated that high AS people drink for coping related motives rather than social affiliative motives. Hence, results of these studies were consistent with results from self-report questionnaire studies.

To conclude, research thus far has indicated a positive association between AS and drinking primarily for coping-related motives in both clinical and nonclinical samples and a positive correlation between AS and negatively reinforced heavy drinking. These implications are consistent with the etiological view that alcohol use is usually motivated by tension reduction. Further, studies supporting a relationship between AS and drinking motives (particularly coping-related drinking motives) seem more consistent than those supporting a relationship between AS and elevated levels of alcohol consumption.

### **1. 7. Purpose of the Present Study**

The importance of AS in the etiology and maintenance of anxiety disorders has been well-documented (i.e., Zinbarg et al., 1997). In literature, there is a growing consensus that AS is a hierarchically organized structure consisting of multiple lower-order factors which load on a single higher order factor. Yet, the number and nature of lower-order factors is a still controversial issue. The first purpose of the present study was to determine the factorial structure of the Turkish version of ASI-R in a sample of university students. For this purpose, the first step in the present study was to conduct an exploratory factor analysis to determine the number of lower order factors of the ASI-R. After the exploratory factor analysis, the reliability of the items and lower order factors were also examined to determine internal consistency of the scale.

A growing number of research has demonstrated a relationship between AS and alcohol and substance use / abuse (Stewart et al., 1997; Stewart et al., 1999).

Some studies found evidence that AS levels directly associated with frequency / quantity of alcohol use (e.g., Stewart et al., 1995) whereas some found that AS was not related to levels of alcohol consumption but only related to drinking motives (e.g., Novak et al., 2003). In an attempt to understand the overlap between AS and drinking behavior in both nonclinical and clinical samples, the present study examined the relationship between AS and drinking motives, as well as the relationship between AS and alcohol use (i.e. amount of alcohol use).

In university students using alcohol, gender differences were examined in terms of AS, drinking behavior and drinking motives. In addition, it was examined whether drinking behavior and drinking motives were different in terms of low, moderate and high AS levels in student drinkers. Predictors of drinking behavior and drinking motives were also investigated in university student sample. Relationship among AS, drinking behavior and drinking motives were explored in alcohol dependent patient sample.

## **1. 8. Hypotheses of the study**

Based on previous findings, several hypotheses regarding the expected results of the current study were established.

### **University Student Sample**

1. It was predicted that females would score significantly higher than males on the ASI-R and its lower order factor scores.

2. It was hypothesized that students would show significant differences on drinking behavior measures in terms of their AS levels. Specifically, students with high AS would report significantly more alcohol consumption and would score significantly higher on AUDIT's subscale scores of hazardous alcohol use and symptoms of alcohol dependence than those of with moderate and low AS.
3. Consistent with previous research, it was hypothesized that the frequency and amount of alcohol use, hazardous alcohol use and symptoms of alcohol dependence will be predicted by the ASI-R lower order factors, particularly by the ASI-R lower-order factor of "fear of cognitive dyscontrol".
4. It was hypothesized that the frequency and amount of alcohol use, hazardous alcohol use and symptoms of alcohol dependence will be predicted by the Coping Motive and ASI-R lower order factors after controlling age, gender, and depression level of the students using alcohol.
5. Consistent with previous research, it was predicted that university student drinkers would report alcohol use mostly for positive reinforcement drinking motives (Enhancement and Social Motives) than negative reinforcement drinking motives (Coping and Conformity Motives).
6. It was predicted that students with high AS would report significantly more negative reinforcement drinking motives (Coping and Conformity Motives) than those with moderate and low AS.

7. It was expected that drinking motives will be predicted by the lower order factors of the ASI-R, particularly by the “fear of cognitive dyscontrol” lower order factor.

### **Alcohol Dependent Inpatient Sample**

1. It was hypothesized that the frequency and amount of alcohol use, hazardous alcohol use, symptoms of alcohol dependence and harmful alcohol use will be significantly and positively correlated with the ASI-R lower order factors.

2. Consistent with previous research, it was predicted that alcohol dependent patients would report alcohol use mostly for negative reinforcement drinking motives (Coping and Conformity Motives) than positive reinforcement drinking motives (Enhancement and Social Motives).

3. It was expected that ASI-R lower order factors will be significantly and positively correlated with Coping Motives.

## **CHAPTER II**

### **METHOD**

#### **2. 1. Participants**

##### **2. 1. 1. University Students**

Participants were 411 volunteer university students including 225 (54.7%) females and 186 (45.3%) males. The mean age for the students was 21.46 (SD = 1.93, range = 17-31). Of the students, 28 were preparatory class students (6.8%), 54 first year (13.1%), 83 second year (20.2%), 112 third year (27.3%), 115 fourth year (28%), 13 master (3.2%) and 6 were doctoral students (1.5%). Of the total sample, 313 (76.3%), of which 177 (56.5%) were female and 136 (43.5%) were male, reported using alcohol. The mean age of the students who reported using alcohol was 21.46 (SD = 1.98, range = 17-31). The mean age for the female students who reported using alcohol was 20.87 (SD = 1.74, range = 17-31) and it was 22.22 for the male students (SD = 2.01, range = 17-31).

##### **2. 1. 2. The Alcohol Dependent Inpatients**

A total of 55 alcohol dependent inpatients were included as participants. Of the participants, 33 were hospitalized in Ankara University Medical School Hospital, Psychiatry Clinic, Alcohol and Substance Dependence Treatment Unit, and 22 were hospitalized in Bakırköy State Hospital for Psychiatric and Neurological Diseases, Alcohol and Drug Treatment, Education and Research Center (AMATEM) in

Istanbul. Among the participants, 52 were male (94.5%) and 3 (5.5%) were female. The mean age of the sample was 42.80 (SD = 11.71, range = 26-75). The mean age for the female patients was 29 (SD = 2.64, range = 26-31), and it was 43.59 for the male patients (SD = 11.53, range = 26-75). Among the patients, 8 (14.5%) had primary school education, 6 (10.09%) secondary school education, 26 (47.3%) high school education, and 14 (25.5%) university education. All of the patients were under medication as part of the alcohol dependence treatment program. They were also receiving psychological treatment as part of this treatment program.

## **2. 2. Materials**

Both university students and alcohol dependent patients were administered a battery of self-report measures including Anxiety Sensitivity Index-Revised (ASI-R), State-Trait Anxiety Inventory-Trait Form (STAI-T), Beck Depression Inventory (BDI), Alcohol Use Disorders Identification Test (AUDIT) and Drinking Motives Questionnaire-Revised (DMQ-R), and a basic demographic information form asking about age, gender, class, department and educational level of participants.

### **2. 2. 1. Anxiety Sensitivity Index-Revised (ASI-R)**

ASI-R was developed by Taylor and Cox (1998b). It is based on an expanded measure of AS, and thought to be a better measure to assess various aspects of AS as compared to the original 16-item ASI (Reiss et al., 1986). It has 36 items including 10 items from the original 16-item ASI and participants indicate each item on a 5-point Likert-type scale (0 = very little to 4 = very much). Total score ranges between 0 and 144. ASI-R was originally designed to measure 6 factors (scales) derived from

the results of previous factor analytic studies of the ASI (see Taylor, 1996). Taylor and Cox (1998b) demonstrated that all six scales had good levels of internal consistency: fear of cardiovascular symptoms ( $\alpha= 0.88$ ), fear of respiratory symptoms ( $\alpha= 0.91$ ), fear of gastrointestinal symptoms ( $\alpha= 0.80$ ), fear of publicly observable anxiety reactions ( $\alpha= 0.86$ ), fear of dissociative and neurological symptoms ( $\alpha= 0.83$ ) and fear of cognitive dyscontrol ( $\alpha= 0.89$ ).

Factor analytic studies usually indicated that ASI-R has a multidimensional structure with four lower-order factors loading on one higher order factor. Taylor and Cox (1998b) and Deacon et al. (2003) found that the ASI-R has four lower-order factors which load on a single higher order factor. Additionally, Taylor and Cox (1998b) indicated that the ASI-R has demonstrated adequate convergent and discriminant validity with validated measures of psychiatric symptoms. Deacon et al. (2003) found that the ASI-R has excellent internal consistency ( $\alpha= 0.94$ ).

The ASI-R was adapted to Turkish by Durmuş-Sandler (2001). The internal consistency of the Turkish version of the ASI-R was 0.94. Other than the fear of gastrointestinal symptoms subscale (GI), which has a moderate reliability ( $\alpha= 0.66$ ), all subscales are obtained as highly reliable in the Turkish version of the ASI-R. Namely, Cronbach's alpha has been found 0.75 for fear of publicly observable anxiety reactions subscale (SOC), 0.87 for fear of respiratory symptoms subscale (RESP), 0.79 for fear of cognitive dyscontrol subscale (COG), 0.78 for fear of dissociative and neurological symptoms subscale (NEUR), and 0.82 for fear of cardiovascular symptoms subscale (HRT). For the total ASI-R, test-retest reliability was 0.75; for SOC 0.70, for GI 0.70, for RESP 0.67, for COG 0.67, for NEUR 0.65 and for HRT 0.65. Durmuş-Sandler (2001) has also demonstrated the criterion

validity of the ASI-R by indicating that the ASI-R is well able to discriminate clinically anxious people from non-anxious (nonclinical) people. Factor structure and reliability of the Turkish version of ASI-R in the present study were presented in the results section. A copy of the ASI-R is presented in Appendix A.

### **2. 2. 2. State-Trait Anxiety Inventory-Trait Form (STAI-T)**

STAI-T, developed by Spielberger et al. (1983; cited in Öner & Le Compte, 1985), is a 20-item questionnaire that asks the individual to rate a number of anxiety-related symptoms with reference to how they feel in general. Items are rated from 1 (almost never) to 4 (almost always) on a 4-point Likert-type scale. Total score in the scale ranges from 20 to 80. Psychometric evaluation has shown that STAI-T to be a reliable and valid measure of trait anxiety (Spielberger et al., 1983; cited in Öner & Le Compte, 1985). The Turkish standardization of the scale was conducted by Öner and Le Compte (1985). Test-retest reliability of the Turkish form of STAI-T was found to vary between 0.71 and 0.86. The criterion and construct validity was demonstrated to be satisfactory (Öner & LeCompte, 1985). In the present study, STAI-T has been found to possess high internal consistency in university student sample as measured by Cronbach's alpha coefficient ( $\alpha = 0.85$ ). A copy of the STAI-T is presented in Appendix B.

### **2. 2. 3. Beck Depression Inventory (BDI)**

BDI was first developed by Beck, Ward, Mendelson, Mock and Erbaugh in 1961, afterwards in 1978, Beck, Rush, Shaw and Emery developed its second form (Savaşır & Şahin, 1997). It was developed to measure the level of depression and

consists of 21 sets of 4 statements representing varying levels of depressive symptoms. Participants choose the statement in each set that is most true for them during the past week. Each item is scored between 0 and 3, and total score ranges between 0 and 63. Psychometric evaluation has shown that BDI has high levels of reliability and validity. Turkish adaptation of BDI was developed by Hisli (1988). The split-half reliability of the Turkish version BDI has been found 0.74 and test-retest reliability coefficient was between 0.74 and 0.86. In terms of validity, it has correlations of 0.55 with STAI-T, 0.74 with Automatic Thoughts Scale and 0.63 with MMPI-D. In the present study, BDI has been found to possess high internal consistency in university student sample ( $\alpha = 0.86$ ). A copy of the BDI is presented in Appendix C.

#### **2. 2. 4. Alcohol Use Disorders Identification Test (AUDIT, 1989)**

AUDIT is a widely used structured 10-item self-report measure of hazardous and harmful alcohol use. It was first developed in a World Health Organization (WHO) collaborative project across six countries by Babor, De La Fuente, Saunders and Grant (1989). Babor, Higgins-Biddle, Saunders and Monteri (2001) have developed its last version. AUDIT assesses frequency and quantity of alcohol consumption, including episodes of binge drinking, alcohol-related problems and dependence symptoms. It was developed to identify persons at risk of developing alcohol use disorders rather than to identify persons who meet criteria for alcohol dependence. The 10-items AUDIT uses ICD-10 criteria to detect patients with symptoms of alcohol dependence (3 items), harmful alcohol consumption (4 items), and hazardous alcohol consumption (3 items) (Volk, Steinbauer, Cantor, & Holzer,

1997). AUDIT is scored by summing the scores of each item. The maximum score is 40 and a cut-off of 8 or 9 is recommended as a sign of hazardous and harmful alcohol consumption. AUDIT has good internal consistency ( $\alpha$  ranging from 0.80 to 0.94) and test-retest reliability ( $r = 0.88$  over a 6-week period).

AUDIT was adapted to Turkish by Saatçioğlu, Evren and Çakmak (2002). Saatçioğlu et al. (2002) demonstrated that Turkish version of AUDIT is a reliable and valid instrument. The internal consistency coefficient was 0.59 and 0.65 for each interviewer in the study. For each of the items, the corrected item-total correlation values in the instrument were higher than 0.30. The two interviewers showed a high interrater correlation ( $r = 0.81$ ,  $p < .001$ ), and kappa values for the items were found to range between 0.21 and 0.61. Test-retest reliability of the scale was found to be significantly high ( $r = 0.90$ ,  $p < .001$ ). In evaluation of the concurrent validity, they found a significant correlation between the Turkish form of AUDIT and Michigan Alcohol Screening Test (MAST) ( $r = 0.32$ ,  $p < .05$ ). In the present study, internal consistency of the AUDIT in the university student sample has been found 0.70. In the university student sample, internal consistency of the AUDIT's subscales of hazardous alcohol use, symptoms of alcohol dependence and harmful alcohol use as measured by Cronbach's alpha coefficient has been found 0.71, 0.46, and 0.42, respectively. Since AUDIT subscale score of harmful alcohol use had a positively skewed distribution in the university student sample violating normality assumption required for ANOVA and regression analysis, this subscale score was not taken into the analyses. In the present study, AUDIT Item 1 was used as a measure assessing frequency of alcohol use and AUDIT Item 2 was used as a measure assessing amount of alcohol use. A copy of the AUDIT is presented in Appendix D.

### **2. 2. 5. Drinking Motives Questionnaire-Revised (DMQ-R, 1994)**

DMQ-R derived from the motivational model of alcohol use and developed by Cooper (1994). It is a 20-item self-report measure of the degree to which individuals use alcohol for four conceptually and empirically distinct reasons: Coping Motives (e.g., “to forget about your problems”), Conformity Motives (e.g., “to fit in with a group you like”), Enhancement Motives (e.g., “because it is fun”), and Social Motives (e.g., “to celebrate a special occasion with friends”) (Cooper, 1994). Respondents indicate their relative frequency of alcohol use for each of the indicated reasons on a 5-point Likert-type scale from 1 (never) to 5 (always). Subscale scores were computed by adding the ratings for each of the 5 items on each subscale (possible range of 5-25). Thus, high scores on a particular drinking motives subscale refer to individuals who usually attribute their drinking to that motive, independent of how often they drink. Alpha reliability coefficients of the Enhancement, Conformity, Coping, and Social motives were 0.88, 0.85, 0.84 and 0.85, respectively. MacLean and Lecci (2000) have also shown that each of the subscale of the DMQ-R has adequate internal reliability (range = 0.81- 0.92).

DMQ-R was adapted to Turkish by Topuz (2004). The exploratory factor analysis indicated 4 factors just like in the original form. Item distribution to factors was also similar to the original DMQ-R. Alpha reliabilities of the subscales of the Turkish version of the DMQ-R were as follows: 0.88 for Coping, 0.88 for Enhancement, 0.86 for Social and 0.79 for Conformity motives.

In the present study, lower-order factor scores of the DMQ-R were calculated using item subsets taken from the factor analyses reported by Topuz (2004). In the present study, DMQ-R possessed high internal consistency ( $\alpha = 0.87$ ) and the lower-

order factors have also been found to be highly reliable, with a Cronbach alpha of 0.89 for Coping, 0.84 for Enhancement, 0.84 for Social and 0.78 for Conformity motive. A copy of the DMQ-R is presented in Appendix E.

## **2. 3. Procedure**

### **2. 3. 1. University Students**

First, the researcher contacted the instructors of four courses from departments of sociology, philosophy, mechanical engineering, and economics held at Middle East Technical University (METU, Ankara) and asked for permission to administer the scale battery in the regular course hour. After the permission of the instructor, the scales were administered in the regular class hours. Additionally, students staying at dormitories on the campus of METU and students in the different canteens of the campus were asked to participate voluntarily in the study. If they accept to fill out the questionnaires, the researcher administered the battery in the canteen or at the study room of the dormitory. Students were from various departments including engineering, educational, social and administrative sciences. Before filling out the questionnaires, all students were asked to read and sign the informed consent form. Then, students voluntarily completed the questionnaires approximately in 20 minutes. Only those who reported alcohol use completed the DMQ-R. After they filled out the questionnaires, they were debriefed and thanked for their participation.

### **2. 3. 2. The Alcohol Dependent Inpatients**

The volunteer inpatients, who are hospitalized and who are under the treatment of alcohol dependence were asked to participate in the study. Then, they were asked to read and sign the informed consent form before starting to fill out the questionnaires. The questionnaires were filled individually or in the ward of the psychiatry unit of the hospital as a group. The researcher was available for help if there is a question regarding filling out of the questionnaires. Participants completed the questionnaires approximately in 25 minutes. After participants filled out the questionnaires, they were debriefed and thanked for their participation.

### **2. 4. Data Analysis**

Data analysis and all statistical analyses for this study were carried out by SPSS for Windows (Statistical Package for Social Sciences for Windows Release 13.0). Demographic information was analyzed through descriptive statistics.

In order to examine the factor structure of the ASI-R, factor analysis was performed by using Principle Component Analysis and Principal Axis Factoring.

In order to determine consistency between PCA and PAF solutions (Congruency Analysis) simple correlations between the corresponding factors of the PCA and PAF solutions were performed. Cronbach's Alpha coefficients were used for self-report measures scale reliability analysis. In order to determine convergent and divergent validity of the ASI-R, simple correlations among the ASI-R, ASI-R factor scales, STAI-T and BDI were performed.

To examine possible gender differences in terms of ASI-R and its four lower order factors, separate independent samples *t*- tests were conducted. A series of one-

way analysis of variance (ANOVA) were performed in order to evaluate whether alcohol use tendency of the students vary as a function of the AS levels. To evaluate whether the lower-order components of AS predict drinking behavior and drinking motives of students, a series of hierarchical multiple regression analyses were conducted. In order to determine whether the lower-order components of AS and Coping Motives together predict drinking behavior of students a series of hierarchical multiple regression analyses were also conducted.

In order to determine whether university students using alcohol and alcohol dependent inpatients are different in terms of drinking motives, two separate one-way within subjects ANOVA's were performed using drinking motives scores as within-subjects variables. To determine whether the mean scores of four drinking motives were significantly different from each other, follow-up post-hoc tests (Tukey's HSD Test) were conducted. In order to investigate whether drinking motives varied as a function of AS group, separate one-way between-subjects ANOVA were conducted. To determine which AS groups are significantly different from each other on each drinking motive, follow-up post-hoc tests (LSD Test) were conducted.

Finally, to examine the relationship between AS, alcohol use and drinking motives among alcohol dependent inpatients, simple correlation analyses were performed.

## **CHAPTER III**

### **RESULTS**

#### **3. 1. Factor Structure, Validity and Reliability of the ASI-R**

To determine factor structure and reliability of the lower order factors of the ASI-R, factor analysis and reliability analysis were conducted using student sample. First, data were examined for missing values, and univariate and multivariate outliers and 18 cases were deleted. The further analyses were conducted by 393 cases.

##### **3. 1. 1. Factor Structure of the ASI-R**

As a preliminary step, the Keiser-Meyer-Olkin (KMO) index of sampling adequacy was calculated. This is a measure of the factorability of the correlation matrices on which the factor analyses were based. The index ranges from 0 (inadequate) to 1 (excellent) (Tabachnick & Fidell, 2001). In the present study, the KMO value was 0.91, which indicates that the sample was suitable for factor analysis. The initial principal component analysis (PCA) extracted eight factors with eigenvalues greater than 1. The eigenvalues of these eight factors were as follows: 11.452, 2.403, 1.771, 1.521, 1.473, 1.275, 1.186, and 1.079. This initial solution accounted for 61.55% of the total variance. In order to determine the correct number of factors to retain, parallel analysis was conducted with an oblique rotation. Parallel analysis using the mean eigenvalues indicated a four-factor solution. Then, a PCA with an oblique rotation was conducted for the four factor solution. The results of PCA with the oblique rotation are presented in Table 1, indicating the factor loadings

of pattern matrix, communalities, the eigenvalues of the factors and the percentage of explained variance for the four factors. The four factor solution accounted for 47.63% of the total variance. The first factor accounted for 31.81%, the second 6.67%, the third 4.91% and the fourth factor accounted 4.22% of the variance. As can be seen in Table 1, since there are small number of items which have salient loadings ( $\geq 0.30$ ) on more than one factor (complex items) and only one item failing to have a salient loading on any factor (hyperplane items) (item no: 28), it can be concluded that the solution have a roughly simple structure. According to the pattern of salient loadings in Table1, the four factors were labeled as follows: fear of respiratory symptoms (Factor 1), fear of cardiovascular symptoms (Factor 2), fear of cognitive dyscontrol (Factor 3), fear of publicly observable anxiety symptoms (Factor 4). Each of the four lower-order factors had a substantial number of items with salient factor loadings. The first factor included 10 (item no's; 3, 4, 5, 8, 13, 15, 16, 17, 18, and 27), second factor 10 (item no's; 6, 7, 9, 11, 14, 19, 25, 26, 29, and 33), third factor 7 (item no's; 2, 10, 23, 31, 32, 34, and 36) and the fourth factor 8 (item no's; 1, 12, 20, 21, 22, 24, 30, and 35) items.

**Table 1.** Factor Loadings and Communalities (h<sup>2</sup>) for the Four Factor Solution of the PCA and PAF after Oblique Rotation

ASIR items	Factor I		Factor II		Factor III		Factor IV		h <sup>2</sup>	
Smothering sensations scare me	<b>0.92</b>	<b>(0.90)</b>	0.18	-(0.20)	0.02	(0.00)	-0.06	-(0.02)	0.34	(0.23)
It scares me when I become short of breath	<b>0.91</b>	<b>(0.87)</b>	-0.08	-(0.05)	-0.12	-(0.14)	-0.03	-(0.01)	0.27	(0.17)
When my chest feels tight. I get scared that I won't be able to breathe properly	<b>0.81</b>	<b>(0.82)</b>	-0.06	-(0.11)	0.09	(0.10)	-0.08	-(0.05)	0.35	(0.29)
When my breathing becomes irregular. I fear that something bad will happen	<b>0.81</b>	<b>(0.83)</b>	-0.05	-(0.09)	0.05	(0.03)	0.02	(0.05)	0.48	(0.40)
When I feel like I'm not getting enough air I get scared that I might suffocate	<b>0.69</b>	<b>(0.68)</b>	-0.05	-(0.10)	0.12	(0.11)	-0.03	(0.01)	0.49	(0.46)
When I notice my heart skipping a beat. I worry that there is something seriously wrong with me	<b>0.61</b>	<b>(0.55)</b>	0.26	(0.27)	-0.08	-(0.06)	0.04	-(0.04)	0.45	(0.38)
It scares me when I feel faint	<b>0.59</b>	<b>(0.45)</b>	0.06	(0.18)	-0.22	-(0.21)	0.28	(0.25)	0.43	(0.38)
It scares me when my heart beats rapidly	<b>0.53</b>	<b>(0.42)</b>	0.22	(0.31)	-0.10	-(0.11)	0.13	(0.11)	0.64	(0.59)
It scares me when I feel "shaky" trembling	<b>0.46</b>	<b>(0.33)</b>	-0.13	(0.01)	0.11	(0.05)	0.26	(0.25)	0.49	(0.42)
It frightens me when my surroundings seem strange or unreal	<b>0.39</b>	<b>(0.32)</b>	-0.08	-(0.03)	0.23	(0.20)	0.19	(0.19)	0.38	(0.26)
When I feel a strong pain in my stomach. I worry it could be cancer	<u>-0.34</u>	-(0.30)	<b>0.88</b>	<b>(0.77)</b>	0.07	(0.11)	0.08	(0.03)	0.38	(0.33)
When my stomach is upset. I worry that I might be seriously ill	-0.05	-(0.07)	<b>0.73</b>	<b>(0.72)</b>	-0.07	-(0.05)	0.07	(0.01)	0.51	(0.47)
It scares me when I am nauseous	0.09	(0.06)	<b>0.63</b>	<b>(0.60)</b>	-0.15	-(0.11)	0.11	(0.05)	0.51	(0.47)
When my head is pounding I worry I could have a stroke	-0.01	(0.00)	<b>0.52</b>	<b>(0.47)</b>	0.17	(0.15)	0.01	(0.01)	0.32	(0.26)
When I get diarrhea. I worry that I might have something wrong with me	0.02	(0.05)	<b>0.51</b>	<b>(0.41)</b>	0.01	(0.05)	0.09	(0.06)	0.64	(0.61)
When my heart is beating rapidly. I worry that I might have a heart attack	<u>0.35</u>	(0.30)	<b>0.44</b>	<b>(0.43)</b>	0.01	(0.04)	-0.19	-(0.19)	0.66	(0.65)
When I feel pain in my chest. I worry that I'm going to have a heart attack	<u>0.42</u>	(0.39)	<b>0.42</b>	<b>(0.40)</b>	0.10	(0.14)	-0.23	-(0.23)	0.36	(0.32)
When my face feels numb. I worry that I might be having a stroke	0.17	(0.16)	<b>0.39</b>	<b>(0.35)</b>	0.25	(0.25)	-0.02	-(0.02)	0.64	(0.59)
When I have trouble swallowing, I worry that I could choke	0.22	(0.25)	<b>0.35</b>	(0.24)	0.29	(0.29)	-0.14	-(0.11)	0.56	(0.51)
When I feel dizzy, I worry there is something wrong with my brain	<u>0.31</u>	(0.26)	<b>0.32</b>	<b>(0.32)</b>	0.07	(0.08)	0.09	(0.08)	0.36	(0.21)

**Table 1 (continue).**

ASIR items	Factor I		Factor II		Factor III		Factor IV		h <sup>2</sup>	
It scares me when I feel tingling or prickling sensations in my hands	0.25	(0.22)	0.27	(0.24)	0.14	(0.14)	0.03	(0.03)	0.49	(0.45)
When my thoughts seem to speed up, I worry that I might be going crazy	-0.05	-(0.04)	0.04	-(0.04)	<b>0.79</b>	<b>(0.77)</b>	0.00	(0.03)	0.56	(0.52)
When I have trouble thinking clearly, I worry there is something wrong with me	-0.10	-(0.11)	0.08	(0.04)	<b>0.76</b>	<b>(0.73)</b>	0.07	(0.10)	0.49	(0.43)
When I feel “spacey” or spaced out I worry that I may be mentally ill	0.06	(0.07)	0.10	(0.05)	<b>0.65</b>	<b>(0.61)</b>	-0.09	-(0.05)	0.44	(0.38)
When my mind goes blank I worry there is something terribly wrong with me	0.00	(0.03)	0.07	(0.02)	<b>0.63</b>	<b>(0.56)</b>	0.03	(0.06)	0.6	(0.45)
When I cannot keep my mind on a task, I worry that I might be going crazy	0.04	-(0.02)	-0.13	(0.03)	<b>0.46</b>	(0.29)	0.17	(0.18)	0.434	(0.39)
It scares me when I am unable to keep my mind on a task	0.10	(0.05)	-0.22	-(0.09)	<b>0.46</b>	<b>(0.31)</b>	<u>0.32</u>	<b>(0.31)</b>	0.55	(0.51)
When my throat feels tight, I worry that I could choke to death	0.11	(0.17)	<u>0.34</u>	(0.20)	<b>0.41</b>	<b>(0.40)</b>	-0.12	-(0.09)	0.32	(0.30)
When I begin to sweat in a social situation, I fear people will think negatively of me	-0.08	-(0.06)	0.03	-(0.02)	0.18	(0.12)	<b>0.69</b>	<b>(0.70)</b>	0.43	(0.40)
I worry that other people will notice my anxiety	0.04	(0.05)	-0.07	-(0.10)	0.19	(0.11)	<b>0.67</b>	<b>(0.68)</b>	0.57	(0.53)
I think it would be horrible for me to faint in public	-0.06	-(0.06)	0.26	(0.23)	-0.15	-(0.11)	<b>0.59</b>	<b>(0.48)</b>	0.62	(0.55)
It is important for me not to appear nervous	-0.01	-(0.01)	-0.24	-(0.19)	0.14	(0.07)	<b>0.59</b>	<b>(0.52)</b>	0.45	(0.39)
When I tremble in the presence of others I fear what people might think of me	0.04	(0.06)	0.12	(0.07)	0.11	(0.08)	<b>0.58</b>	<b>(0.57)</b>	0.45	(0.42)
I believe it would be awful to vomit in public	0.08	(0.04)	0.16	(0.17)	-0.31	-(0.22)	<b>0.56</b>	<b>(0.43)</b>	0.6	(0.55)
It scares me when I blush in front of people	-0.14	-(0.08)	0.15	(0.07)	0.23	(0.18)	<b>0.53</b>	<b>(0.51)</b>	0.41	(0.30)
It scares me when my body feels strange or different in some way	0.28	(0.19)	0.27	(0.33)	-0.11	-(0.11)	<b>0.39</b>	<b>(0.35)</b>	0.46	(0.38)
Eigenvalues	11.45	(11.45)	2.41	(2.41)	1.77	(1.77)	1.52	(1.52)		
% of explained variance	31.81	(30.26)	6.68	(5.16)	4.91	(3.35)	4.22	(2.66)		

Note. Salient loadings  $\geq .30$ . Loadings and h<sup>2</sup> values in parantheses represent the results of PAF solution. Bold numbers represent the highest salient loadings and underlined numbers specify the second highest loadings.

Factor labels: Factor I, fear of respiratory symptoms; Factor II, fear of cardiovascular symptoms; Factor III, fear of cognitive dyscontrol; Factor IV, fear of publicly observable anxiety symptoms.

Principal axis factor (PAF) analysis was also conducted for the four-factor solutions with oblique rotation. According to the PAF solution, the items loaded on the factors were almost the same as in the PCA and factor loadings changed slightly. Only item 10 loaded on to different factors across PCA and PAF. It loaded on to Factor 3 in PCA, whereas on to Factor 4 in PAF. Additionally, as different from PCA, items 2 and 26 failed to have a salient loading on any factor in PAF. In order to determine consistency between PCA and PAF solutions, congruency analysis was conducted. Congruency coefficient represents the correlations between the corresponding factors of the PCA and PAF solutions. Congruency coefficients for the corresponding factor scores of the Factor I, Factor II, Factor III, and Factor IV according to the PCA and PAF analysis were 0.99, 0.97, 0.98, and 0.98, respectively. PAF results are displayed in Table 1.

In order to identify whether the lower order factors of the ASI-R were loaded on a higher order factor, a second order factor analysis was conducted using PCA with oblique rotation. The factor scores were calculated for each factor by adding items in a factor. PCA results yielded only one factor with an eigenvalue greater than 1. The higher order factor accounted for 68.16% of the total variance. The factor loadings of these four lower order factors were 0.86, 0.86, 0.80, and 0.76.

### **3. 1. 2. Convergent and Divergent Validity of the ASI-R**

The correlations among the ASI-R, ASI-R factor scales, STAI-T and BDI are shown in Table 2. In order to evaluate the convergent and divergent validity of the ASI-R, simple correlational analyses among ASI-R, ASI-R factor scales, STAI-T, and BDI were conducted in university student sample. The four lower-order factors

were moderately and significantly ( $p < 0.01$ ) intercorrelated, with  $r$ s ranging from 0.50 to 0.73. The two somatic ASI-R factors (fear of respiratory and fear of cardiovascular symptoms) were highly correlated ( $r = 0.73$ ), while other correlations between ASI-R factors were moderate. Additionally, the ASI-R lower-order factors had significant and large correlations with the total ASI-R (range = 0.76 - 0.89). These results were indicators of convergent validity of the ASI-R.

**Table 2.**  
Pearson Correlation Coefficients among ASI-R, ASI-R factors, STAI-T and BDI in University Students

Measures	1	2	3	4	5	6	7
1. ASI-R	-						
2. Fear of respiratory symptoms	0.89*	-					
3. Fear of cardiovascular symptoms	0.87*	0.73*	-				
4. Fear of cognitive dyscontrol	0.76*	0.56*	0.59*	-			
5. Fear of publicly observable anxiety symptoms	0.76*	0.52*	0.52*	0.50*	-		
6. STAI-T	0.44*	0.35*	0.33*	0.44*	0.33*	-	
7. BDI	0.32*	0.26*	0.24*	0.40*	0.26*	0.61*	-

\*  $p < .01$

The ASI-R has moderately correlated with the STAI-T ( $r = 0.44, p < 0.01$ ) and the BDI ( $r = 0.32, p < 0.01$ ) in university student sample. In the alcohol dependent inpatient sample, the ASI-R had also moderate correlations with the STAI-T ( $r = 0.62, p < 0.01$ ) and the BDI ( $r = 0.44, p < 0.01$ ). Furthermore, the ASI-R factor scales, too, had modest but significant correlations with the STAI-T ( $r$ s 0.33 – 0.44; for the alcohol dependent sample  $r$ s 0.50 – 0.59), which pointed out that the AS and trait anxiety are correlated but different constructs. These results indicated that the ASI-R has divergent validity as measuring the AS construct.

### **3. 1. 3. Reliability of the ASI-R**

The ASI-R demonstrated an excellent internal consistency ( $\alpha = 0.93$ ). According to Aiken's (1994) consideration of the criterion of 0.20 as an acceptable corrected item-total correlation, all ASI-R items performed adequately. Item-total correlations ranged from 0.25 to 0.68. Each subscale of the ASI-R also showed adequate internal consistency ( $\alpha$ s for Factors I-IV = 0.88, 0.82, 0.79, and 0.80, respectively).

### **3. 2. Relationship among Alcohol Use, Anxiety Sensitivity and Drinking Motives in University Students Using Alcohol**

Among the total of 411 university students, 313 (76.1%) [177 (56.5%) females, 136 (43.5%) males) reported using alcohol. After data were examined for missing values, univariate and multivariate outliers, 15 cases were deleted. The further analyses to examine the relationship among alcohol use, AS and drinking motives were conducted by 298 cases.

### 3. 2. 1. Descriptive Statistics of Self Reported Measures by Gender

Table 3 displays descriptive statistics of self-reported measures by gender. A series of independent sample *t*- tests were conducted to compare female and male students in terms of self-reported measures. Mean ASI-R total score for female university students (M = 41.38, SD = 21.98) was higher than that of male university students (M = 40.72, SD = 18.86); however, this difference was not significant,  $t(296) = 0.28, p > 0.05$ . Male and female students did not differ significantly from each other in terms of ASI-R lower order factors. Frequency [ $t(296) = -2.13, p < 0.05$ ] and amount of alcohol [ $t(296) = -4.16, p < 0.001$ ] use in male students were significantly higher than female students. Male students scored significantly higher on AUDIT's subscale score of hazardous alcohol use than female students,  $t(296) = 4.29, p < 0.01$ . In addition, it has been found that males were using alcohol for more Coping [ $t(296) = -2.03, p < 0.05$ ] and Conformity [ $t(296) = -2.34, p < 0.05$ ] Motives than females (see Table 3).

**Table 3.**

Descriptive Statistics of Self-reported Measures by Gender in University Students

Measures	Female (N=169)		Male (N=129)		Total (N = 298)		<i>t</i>
	M	SD	M	SD	M	SD	
ASI-R	41.38	21.98	40.72	18.86	41.10	20.66	0.28
Fear of respiratory symptoms	1.52	0.84	1.39	0.74	1.47	0.80	1.38
Fear of cardiovascular symptoms	0.83	0.64	0.82	0.59	0.83	0.62	0.08
Fear of cognitive dyscontrol	0.83	0.70	0.82	0.61	0.82	0.66	0.18
Fear of publicly observable anxiety symptoms	1.38	0.73	1.51	0.65	1.43	0.70	-1.64
DMQ-R							
Coping Motive	10.44	4.72	11.61	5.21	10.95	4.97	-2.03*
Social Motive	4.36	4.39	15.03	4.06	14.65	4.26	-1.35
Enhancement Motive	6.23	4.72	16.05	4.16	16.15	4.48	0.33
Conformity Motive	6.55	2.50	7.30	2.93	6.88	2.71	-2.34*
Frequency of alcohol use	1.63	0.64	1.81	0.81	1.70	0.72	-2.13*
Amount of alcohol use	0.37	0.55	0.72	0.82	0.52	0.70	-4.16**
Hazardous alcohol use	2.41	1.53	3.29	1.93	2.79	1.76	4.29**
Symptoms of alcohol dependence	0.68	0.89	0.71	1.11	0.69	0.99	-0.22

\*  $p < .05$ ; \*\*  $p < .01$

### **3. 2. 2. Anxiety Sensitivity and Alcohol Use**

Participants who reported to use alcohol were divided into low, moderate, and high AS groups based on a comparison of their ASI-R scores with the sample mean. This arrangement was used to evaluate whether drinking behavior tendency of the university students vary as a function of the levels of the AS. The low AS group comprised 52 (17.4%) participants whose scores were approximately one standard deviation below the mean. The high AS group consisted of 52 (17.4%) participants whose scores were approximately one standard deviation above the mean. A group of about equivalent sample size was created for the moderate group, whose scores approximated the sample ASI-R mean. The moderate AS group consisted of 64 participants (21.5%) whose scores fell between 36 and 45.

A series of one-way analysis of variance (ANOVA) were conducted in order to evaluate whether the self-reported alcohol use tendency of the students vary as a function of the AS group (low, moderate, high). Scores on different drinking behavior measures (frequency of alcohol use, amount of alcohol use, and AUDIT subscale scores of hazardous alcohol use and symptoms of alcohol dependence) were submitted to separate one-way analyses of variance (ANOVA). A significant AS group effect was not observed for frequency of alcohol use, amount of alcohol use, and AUDIT's subscales of hazardous alcohol use and symptoms of alcohol dependence. Means and standard deviations of drinking behavior scores as a function of AS levels are displayed in Table 4.

**Table 4.**

Drinking Behaviour Scores as a function of AS group

	Anxiety sensitivity group					
	Low (n = 52)		Moderate (n = 64)		High (n = 52)	
	M	SD	M	SD	M	SD
Frequency of alcohol use	1.73	0.69	1.75	0.71	1.63	0.63
Amount of alcohol use	0.62	0.80	0.45	0.66	0.44	0.70
Symptoms of alcohol dependence	0.58	0.75	0.69	1.04	0.85	1.02
Hazardous alcohol use	2.92	1.75	2.75	1.60	2.60	1.56

**3. 2. 3. Anxiety Sensitivity as a Predictor of Alcohol Use**

To evaluate whether the lower-order components of AS predict drinking behavior, a series of hierarchical regression analyses were conducted for each of the drinking behavior measures. The model included the demographic variables of age and gender in Step 1 and the AS subscale scores in Step II. Drinking behavior measures included the frequency of alcohol use, the amount of alcohol use, hazardous alcohol use, and symptoms of alcohol dependence. Variables in each step for this regression analysis are presented in Table 5. Zero-order correlations between criterion variables and predictors are presented in Table 6.

**Table 5.**

Variables in each step for Hierarchical Multiple Regressions using Demographics and ASI-R lower order factors to predict aspects of Drinking Behavior

	Variables
Step I	Age Gender
Step II	Fear of respiratory symptoms Fear of cardiovascular symptoms Fear of cognitive dyscontrol Fear of publicly observable anxiety symptoms
Dependent Variables	The frequency of alcohol use The amount of alcohol use Hazardous alcohol use Symptoms of alcohol dependence

**Table 6.** Zero-order Correlations among Predictor (demographics and ASI-R lower order factors) and Criterion (drinking behavior measures) Variables

Variables	1	2	3	4	5	6	7	8	9	10
1. Gender	-	0.34**	-0.08	-0.01	-0.01	0.10	0.12*	0.25**	0.25**	0.01
2. Age		-	-0.01	-0.01	-0.10	0.02	-0.05	0.03	0.04	-0.04
3. Fear of respiratory symptoms			-	0.70**	0.56**	0.54**	-0.04	-0.11	-0.07	0.08
4. Fear of cardiovascular symptoms				-	0.57**	0.46**	0.01	-0.10	-0.07	0.10
5. Fear of cognitive dyscontrol					-	0.47**	0.06	0.02	0.06	0.12*
6. Fear of publicly observable anxiety symptoms						-	-0.06	0.03	0.01	0.01
7. Frequency of alcohol use							-	0.25**	0.73**	0.40**
8. Amount of alcohol use								-	0.76**	0.23**
9. Hazardous alcohol use									-	0.42**
10. Symptoms of alcohol dependence										-

\*  $p < .05$ ; \*\*  $p < .01$

The results of hierarchical multiple regression analyses for each drinking behavior measure are presented in Table 7, including multiple R (R), R square ( $R^2$ ), adjusted  $R^2$  ( $\Delta R^2$ ), the standardized regression coefficients-Beta ( $\beta$ ), semipartial correlations ( $sp^2$ ) and  $t$  values for each drinking behavior measure of the last step of the analysis.

In the first step, frequency of alcohol use was significantly predicted by age and gender,  $F(2, 295) = 3.70, p < 0.05$ . Addition of the subscale scores of ASI-R to the equation after step two did not result in a significant F change. After step two, only gender ( $\beta = 0.16, p < 0.05$ ) had significant contribution to the variance in the frequency of alcohol use.

Amount of alcohol use was significantly predicted by age and gender in Step 1 of the analysis,  $F(2, 295) = 9.99, p < 0.001$ . Addition of the subscale scores of ASI-R to the equation after step two did not result in a significant F change. After step two, with all the IV's in the equation, overall F was significant [ $F(6, 291) = 4.60, p < 0.01$ ] and only gender ( $\beta = 0.25, p < 0.001$ ) predicted a significant variance on the amount of alcohol use.

Hazardous alcohol use was significantly predicted by age and gender,  $F(2, 295) = 10.13, p < 0.001$ . However, addition of the subscale scores of ASI-R to the equation after step two did not result in a significant F change. After step two, age, gender and subscales of the ASI-R together significantly predicted hazardous alcohol use,  $F(6, 291) = 4.34, p < 0.001$ . Gender ( $\beta = 0.26, p < 0.001$ ) and the ASI-R subscale score of fear of cognitive dyscontrol ( $\beta = 0.15, p < 0.05$ ) predicted a significant variance on hazardous alcohol use.

Symptoms of alcohol dependence was not significantly predicted by both demographic variables (age, gender) and ASI-R lower order factors in each step of the analysis.

**Table 7.** Summary of Hierarchical Multiple Regressions using demographics and ASI-R lower order factors to predict aspects of Drinking Behavior

	R	R <sup>2</sup>	ΔR <sup>2</sup>	β	sp <sup>2</sup>	T
<i>Frequency of alcohol use</i>						
Age				-0.09	-0.09	-1.49
Gender				0.16	0.15	2.59*
Fear of respiratory symptoms				-0.06	-0.04	-0.64
Fear of cardiovascular symptoms				0.04	0.01	0.43
Fear of cognitive dyscontrol				0.12	0.02	1.58
Fear of publicly observable anxiety symptoms				-0.11	-0.09	-1.60
Step 1	0.16	0.02	0.02			
Step 2	0.20	0.04	0.02			
Overall F and <i>df</i> for model	2.06 <sup>†</sup>	(6, 291)				
<i>Amount of alcohol use</i>						
Age				-0.04	-0.04	-0.71
Gender				0.25	0.23	4.06**
Fear of respiratory symptoms				-0.09	-0.06	-1.09
Fear of cardiovascular symptoms				-0.13	-0.09	-1.56
Fear of cognitive dyscontrol				0.11	0.08	1.46
Fear of publicly observable anxiety symptoms				0.07	0.06	1.02
Step 1	0.25	0.06	0.06			
Step 2	0.29	0.09	0.07			
Overall F and <i>df</i> for model	4.60**	(6, 291)				

<sup>†</sup> p < .10; \* p < .05; \*\* p < .01

**Table 7 (continue).**

	R	R <sup>2</sup>	ΔR <sup>2</sup>	β	sp <sup>2</sup>	t
<i>Hazardous alcohol use</i>						
Age				-0.05	-0.03	-0.82
Gender				0.27	0.24	4.44**
Fear of respiratory symptoms				-0.04	-0.03	-0.46
Fear of cardiovascular symptoms				-0.12	-0.08	-1.43
Fear of cognitive dyscontrol				0.15	0.12	2.04*
Fear of publicly observable anxiety symptoms				-0.01	-0.01	-0.13
Step 1	0.25	0.06	0.06			
Step 2	0.29	0.08	0.06			
Overall F and df for model	4.34**	(6, 291)				
<i>Symptoms of alcohol dependence</i>						
Age				-0.05	-0.04	-0.73
Gender				0.04	0.04	0.62
Fear of respiratory symptoms				0.03	0.02	0.37
Fear of cardiovascular symptoms				0.06	0.04	0.69
Fear of cognitive dyscontrol				0.10	0.07	1.27
Fear of publicly observable anxiety symptoms				-0.08	-0.06	-1.10
Step 1	0.05	0.003	-0.004			
Step 2	0.15	0.02	0.001			
Overall F and df for model	1.04	(6, 291)				

† p < .10; \* p < .05; \*\* p < .01.

Note. β, sp<sup>2</sup> and t values are representing the values of the last step of the regression analysis.

### 3. 2. 4. Anxiety Sensitivity and Coping Motives as a Predictors of Alcohol Use

To evaluate whether Coping Motive predicts drinking behavior via the effects of the lower-order components of AS, a series of hierarchical regression analyses were conducted for each of the drinking behavior measures. The model included the demographic variables of age and gender, and BDI total score in Step 1, the AS subscale scores in Step II and Coping Motive score in Step 3. Drinking behavior measures included the frequency of alcohol use, the amount of alcohol use, hazardous alcohol use, and symptoms of alcohol dependence. Variables in each step for this regression analysis are presented in Table 8. Zero-order correlations between criterion variables and predictors are presented in Table 9.

**Table 8.**

Variables in each step for Hierarchical Multiple Regressions using Demographics, BDI, ASI-R lower order factors and Coping Motives to predict aspects of Drinking Behavior

	Variables
Step I	Age Gender BDI
Step II	Fear of respiratory symptoms Fear of cardiovascular symptoms Fear of cognitive dyscontrol Fear of publicly observable anxiety symptoms
Step III	Coping Motives
Dependent Variables	The frequency of alcohol use The amount of alcohol use Hazardous alcohol use Symptoms of alcohol dependence

**Table 9.** Zero-order Correlations among Predictor (demographics, BDI, ASI-R lower order factors, and Coping Motives) and Criterion (drinking behavior measures) Variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. Age	-	0.34**	-0.04	-0.01	-0.01	-0.10	0.02	0.03	-0.05	0.03	0.04	-0.04
2. Gender		-	0.01	-0.08	-0.01	-0.01	0.10	0.12*	0.12*	0.25**	0.25**	0.01
3. BDI			-	0.29**	0.23**	0.40**	0.26**	0.39**	0.11	-0.02	0.12*	0.26*
4. Fear of respiratory symptoms				-	0.70**	0.56**	0.54**	0.09	-0.04	-0.11	-0.07	0.08
5. Fear of cardiovascular symptoms					-	0.57**	0.46**	0.12*	0.01	-0.10	-0.07	0.10
6. Fear of cognitive dyscontrol						-	0.47**	0.19**	0.06	0.02	0.06	0.12*
7. Fear of publicly observable anxiety symptoms							-	0.17**	-0.06	0.03	0.01	0.01
8. Coping Motives								-	0.25**	0.21**	0.28**	0.32**
9. Frequency of alcohol use									-	0.25**	0.73**	0.40**
10. Amount of alcohol use										-	0.76**	0.23**
11. Hazardous alcohol use											-	0.42**
12. Symptoms of alcohol dependence												-

\*  $p < .05$ ; \*\*  $p < .01$

The results of hierarchical multiple regression analyses for each drinking behavior measure are presented in Table 10, including multiple R (R), R square ( $R^2$ ), adjusted  $R^2$  ( $\Delta R^2$ ), the standardized regression coefficients-Beta ( $\beta$ ), semipartial correlations ( $sp^2$ ) and  $t$  values for each drinking behavior measure of the last step of the analysis.

In the first step, frequency of alcohol use was significantly predicted by age, gender and BDI,  $F(3, 294) = 3.66, p < 0.05$ . Addition of the subscale scores of ASI-R to the equation after step two did not result in a significant F change. After Step 2, age, gender, BDI and lower order factors of the ASI-R together significantly predicted frequency of alcohol use,  $F(7, 290) = 2.28, p < 0.05$ . Addition of the Coping Motives to the equation after step three did result in a significant F change. Age, gender, BDI, lower order factors of the ASI-R and Coping Motives together explained 9.6% of the variance in frequency of alcohol use,  $F(8, 289) = 3.83, p < 0.001$ . Examination of the individual variables after step three with all the IV's in the equation revealed that gender ( $\beta = 0.14, p < 0.05$ ), ASI-R subscale of fear of publicly observable anxiety symptoms ( $\beta = -0.14, p < 0.05$ ) and Coping Motives ( $\beta = 0.23, p < 0.001$ ) had a significant contribution to the prediction of frequency of alcohol use.

Amount of alcohol use was significantly predicted by age, gender and BDI in Step 1 of the analysis,  $F(3, 294) = 6.72, p < 0.001$ . Addition of the lower order factors of the ASI-R to the equation after step two did not result in a significant F change. After Step 2, age, gender, BDI and lower order factors of the ASI-R together significantly predicted amount of alcohol use,  $F(7, 290) = 3.98, p < 0.001$ . Addition of the Coping Motive to the equation after step three did result in a significant F change. After step three, with all the IV's in the equation, overall F was significant [

$F(8, 289) = 5.25, p < 0.01$ ], and gender ( $\beta = 0.23, p < 0.001$ ) and Coping Motives ( $\beta = 0.22, p < 0.001$ ) had a significant contribution to the prediction of amount of alcohol use. BDI ( $\beta = -0.12, p < 0.10$ ) and ASI-R subscales of fear of cardiovascular symptoms ( $\beta = -0.14, p < 0.10$ ) had a marginally significant contribution to the prediction of amount of alcohol use. Almost thirty six percent of the variance in amount of alcohol use can be explained by age, gender, BDI, ASI-R lower order factors and Coping Motives.

In the first step, hazardous alcohol use was significantly predicted by age, gender and BDI,  $F(3, 294) = 8.27, p < 0.001$ . Addition of the lower order factors of ASI-R to the equation after step two did not result in a significant F change. After Step 2, age, gender, BDI and lower order factors of the ASI-R together significantly predicted hazardous alcohol use,  $F(7, 290) = 4.30, p < 0.001$ . Addition of the Coping Motives to the equation after step three did result in a significant F change. Age, gender, BDI, lower order factors of the ASI-R and Coping Motives together explained 38.1% of the variance in hazardous alcohol use,  $F(8, 289) = 6.12, p < 0.001$ . Examination of the individual variables after step three with all the IV's in the equation revealed that gender ( $\beta = 0.23, p < 0.001$ ) and Coping Motives ( $\beta = 0.25, p < 0.05$ ) had a significant contribution to the prediction of hazardous alcohol use.

In the first step, symptoms of alcohol dependence was significantly predicted by age, gender and BDI,  $F(3, 294) = 7.49, p < 0.001$ . Addition of the lower order factors of ASI-R to the equation after step two did not result in a significant F change. After Step 2, age, gender, BDI and lower order factors of the ASI-R together significantly predicted symptoms of alcohol dependence,  $F(7, 290) = 3.57, p < 0.001$ . Addition of the Coping Motives to the equation after step three did result in a

significant F change. Age, gender, BDI, lower order factors of the ASI-R and Coping Motives together explained 37% of the variance in symptoms of alcohol dependence,  $F(8, 289) = 5.73, p < 0.001$ . Examination of the individual variables after step three with all the IV's in the equation revealed that BDI ( $\beta = 0.17, p < 0.01$ ) and Coping Motives ( $\beta = 0.26, p < 0.001$ ) had a significant contribution to the prediction of symptoms of alcohol dependence. ASI-R subscales of fear of publicly observable anxiety symptoms ( $\beta = -0.12, p < 0.10$ ) had a marginally significant contribution to the prediction of symptoms of alcohol dependence.

**Table 10.** Summary of Hierarchical Multiple Regressions using demographics, BDI, ASI-R lower order factors and Coping Motives to predict aspects of Drinking Behavior

	R	R <sup>2</sup>	ΔR <sup>2</sup>	β	sp <sup>2</sup>	t
<i>Frequency of alcohol use</i>						
Age				-0.09	-0.09	-1.56
Gender				0.14	0.13	2.26*
BDI				0.03	0.03	0.50
Fear of respiratory symptoms				-0.04	-0.03	-0.51
Fear of cardiovascular symptoms				0.03	0.02	0.40
Fear of cognitive dyscontrol				0.07	0.05	0.88
Fear of publicly observable anxiety symptoms				-0.14	-0.11	-2.00*
Coping Motives				0.23	0.21	3.73**
Step 1	0.19	0.04	0.03			
Step 2	0.23	0.05	0.03			
Step 3	0.31	0.10	0.07			
Overall F and <i>df</i> for model	3.83**	(8, 289)				
<i>Amount of alcohol use</i>						
Age				-0.05	0.04	-0.79
Gender				0.23	0.21	3.81**
BDI				-0.12	-0.10	1.81 <sup>†</sup>
Fear of respiratory symptoms				-0.06	-0.04	-0.75
Fear of cardiovascular symptoms				-0.14	-0.10	-1.75 <sup>†</sup>
Fear of cognitive dyscontrol				0.11	0.08	1.46
Fear of publicly observable anxiety symptoms				0.06	0.05	0.81
Coping Motives				0.22	0.20	3.60**
Step 1	0.25	0.06	0.06			
Step 2	0.30	0.09	0.07			
Step 3	0.36	0.13	0.10			
Overall F and <i>df</i> for model	5.25**	(8, 289)				

<sup>†</sup> p < .10; \* p < .05; \*\* p < .01.

**Table 10. (continue)**

	R	R <sup>2</sup>	ΔR <sup>2</sup>	β	sp <sup>2</sup>	t
<i>Hazardous alcohol use</i>						
Age				-0.04	-0.03	-0.61
Gender				0.23	0.22	3.95**
BDI				0.03	0.02	0.43
Fear of respiratory symptoms				-0.03	-0.02	-0.30
Fear of cardiovascular symptoms				-0.12	-0.08	-1.53
Fear of cognitive dyscontrol				0.10	0.07	1.31
Fear of publicly observable anxiety symptoms				-0.04	-0.03	-0.54
Coping Motives				0.25	0.23	4.15**
Step 1	0.28	0.08	0.07			
Step 2	0.31	0.09	0.07			
Step 3	0.38	0.15	0.12			
Overall F and <i>df</i> for model	6.12**	(8, 289)				
<i>Symptoms of alcohol dependence</i>						
Age				-0.05	-0.04	-0.79
Gender				0.01	0.01	0.15
BDI				0.17	0.14	2.62**
Fear of respiratory symptoms				0.03	0.02	0.39
Fear of cardiovascular symptoms				0.06	0.04	0.80
Fear of cognitive dyscontrol				0.01	-0.01	-0.11
Fear of publicly observable anxiety symptoms				0.12	-0.09	-1.72 <sup>†</sup>
Coping Motives				0.26	0.24	4.39**
Step 1	0.27	0.07	0.06			
Step 2	0.28	0.08	0.06			
Step 3	0.37	0.14	0.11			
Overall F and <i>df</i> for model	5.73**	(8, 289)				

<sup>†</sup> p < .10; \* p < .05; \*\* p < .01.

Note. β, sp<sup>2</sup> and t values are representing the values of the last step of the regression analysis.

### 3. 2. 4. Alcohol Use, Anxiety Sensitivity and Drinking Motives

In order to determine whether university students using alcohol are different in terms of drinking motives, a one-way within subjects ANOVA was conducted, using four different factors of DMQ-R as within-subjects variables. The results for the ANOVA indicated a significant drinking motive effect,  $F(3,891) = 410.72$ ,  $p < 0.001$ . The means and standard deviations of drinking motives for the sample of university students using alcohol are presented in Table 11.

As can be seen from Table 11, university students reported using alcohol mostly for Enhancement, Social, Coping, and Conformity Motives, respectively. In order to determine whether the mean scores of four drinking motives were significantly different from each other, follow-up post-hoc tests were conducted. Tukey's HSD test revealed that mean Enhancement Motive score of university students was significantly higher than that of Social Motive [ $q(4, 891) = 7.32$ ,  $p < .01$ ], Coping Motive [ $q(4, 891) = 25.38$ ,  $p < .01$ ], and Conformity Motive [ $q(4, 891) = 45.16$ ,  $p < .01$ ] scores. Mean Social Motive score of university students was significantly higher than that of Coping Motive [ $q(4, 891) = 18.06$ ,  $p < .01$ ] and Conformity Motive [ $q(4, 891) = 37.84$ ,  $p < .01$ ] score of the students. In addition, mean Coping Motive score was significantly higher than that of Conformity Motive score, [ $q(4, 891) = 19.77$ ,  $p < .01$ ].

**Table 11.**

Descriptive Statistics of Drinking Motives Scores of University Students Using Alcohol

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	M	SD
Coping Motive	10.95 <sup>c</sup>	4.97
Social Motive	14.65 <sup>b</sup>	4.26
Enhancement Motive	16.15 <sup>a</sup>	4.48
Conformity Motive	6.88 <sup>d</sup>	2.71

---

Note. Means with different superscripts differ (Tukey's HSD)

To determine whether drinking motives varied as a function of AS group, subscale scores of DMQ-R (Coping Motives, Social Motives, Enhancement Motives, and Conformity Motives) were submitted to separate one-way between subjects ANOVA. A significant AS group effect was observed for the Coping Motives subscale score, [ $F(2, 165) = 3.33, p < 0.05$ ]. Results revealed a small-to-medium strength of association with an eta-squared ( $\eta^2$ ) value of 0.04 which indicated that 4% of the variability in Coping Motives drinking can be explained by levels of AS. Post-hoc comparisons indicated that high and moderate AS groups scored significantly higher on Coping Motives subscale than low AS group; however

moderate and high AS group did not differ significantly from each other in terms of Coping Motives scores (LSD,  $p < 0.05$ ).

A significant AS group effect was observed for the Social Motives subscale score, [ $F(2, 165) = 5.60, p < 0.005$ ]. Results revealed a medium strength of association with an eta-squared ( $\eta^2$ ) value of 0.064 which indicated that 6.4% of the variability in Social Motives drinking can be explained by levels of AS. Post-hoc comparisons indicated that the mean Social Motives subscale score of the high AS group was significantly higher than that of moderate AS group and low AS group, however moderate and low AS group did not differ significantly from each other in terms of Social Motives scores (LSD,  $p < 0.05$ ).

A significant AS group effect was also observed for the Conformity Motives subscale score, [ $F(2, 165) = 16.21, p < 0.001$ ]. Results revealed a large strength of association with an eta-squared ( $\eta^2$ ) value of 0.164 which indicated that 16.4% of the variability in Conformity Motives drinking can be explained by levels of AS. Post-hoc comparisons indicated that the mean Conformity Motives subscale score of the high AS group was significantly higher than that of moderate AS group and low AS group, however moderate and low AS group did not differ significantly from each other in terms of Conformity Motives scores (LSD,  $p < 0.05$ ).

However, a significant AS group effect was not observed for the Enhancement Motives subscale score, [ $F(2, 165) = 0.24, p > 0.05$ ]. Consistently, results revealed a very small strength of association with an eta-squared ( $\eta^2$ ) value of 0.003 which indicated that only 0.3% of the variability in Enhancement Motives drinking can be explained by levels of AS. One-way ANOVA results for the four drinking motives as a function of the AS group are displayed in Table 12.

**Table 12.** Comparison of Drinking Motives Scores as a function of AS group

	Anxiety sensitivity group						Source	SS	df	MS	F
	Low (n = 52)		Moderate (n = 64)		High (n = 52)						
	M	SD	M	SD	M	SD					
DMQ-R Subscales											
Coping Motive	9.73 <sup>a</sup>	5.06	11.92 <sup>b</sup>	4.87	11.95 <sup>b</sup>	5.47	Between	174.39	2	87.19	3.33*
							Error	4325.87	165	26.22	
							Total	4500.26	167		
Social Motive	14.25 <sup>a</sup>	3.76	13.84 <sup>a</sup>	4.71	16.33 <sup>b</sup>	3.88	Between	195.48	2	97.74	5.59**
							Error	2882.74	165	17.47	
							Total	3078.22	167		
Enhancement Motive	15.87	4.23	16.23	4.33	16.47	4.87	Between	9.77	2	4.89	0.24(ns)
							Error	3302.66	165	20.02	
							Total	3312.43	167		
Conformity Motive	5.83 <sup>a</sup>	1.72	6.57 <sup>a</sup>	2.18	8.66 <sup>b</sup>	3.71	Between	226.49	2	113.24	16.20***
							Error	1152.95	165	6.99	
							Total	1379.44	167		

\* p<0.05; \*\* p<0.01; \*\*\* p<0.001; ns: not significant.

Note. Means with different superscripts differ (LSD)

### 3. 2. 5. Anxiety Sensitivity as a Predictor of Drinking Motives

Separate hierarchical multiple regressions tested demographics (age, gender), drinking behavior measures (hazardous alcohol use and symptoms of alcohol dependence), and lower-order AS components as predictors for four drinking motives. In each regression demographic variables (gender, age) were entered as a block in Step I, AUDIT subscale scores of hazardous alcohol use, symptoms of alcohol dependence, were entered as a block in Step II, and ASI-R subscale scores were entered as a block in Step III. Drinking motives measures as criterion variables included subscale scores of DMQ-R of Coping, Social, Enhancement and Conformity Motives. Variables in each step for this regression analysis are presented in Table 13. Zero-order correlations between criterion variables and predictors are presented in Table 14.

**Table 13.**

Variables in each step for Hierarchical Multiple Regressions using Demographics, AUDIT's two subscales and ASI-R lower order factors to predict Drinking Motives

	Variables
Step I	Age Gender
Step II	Hazardous alcohol use Symptoms of alcohol dependence
Step II	Fear of respiratory symptoms Fear of cardiovascular symptoms Fear of cognitive dyscontrol Fear of publicly observable anxiety symptoms
Dependent Variables	Coping Motive Social Motive Enhancement Motive Conformity Motive

**Table 14.** Zero-order Correlations among Predictor (demographics, AUDIT's two subscales and ASI-R lower order factors) and Criterion (drinking motives) Variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. Gender	-	0.34**	0.25**	0.01	-0.08	-0.01	-0.01	0.10	0.12*	0.08	-0.02	0.14**
2. Age		-	0.04	-0.04	-0.01	-0.01	-0.10	0.02	0.03	0.12*	-0.10	0.13*
3. Hazardous alcohol use			-	0.42**	-0.07	-0.07	0.06	0.01	0.28**	0.21**	0.37**	-0.04
4. Symptoms of alcohol dependence				-	0.08	0.10	0.12*	0.01	0.32**	0.13*	0.30**	0.06
5. Fear of respiratory symptoms					-	0.70**	0.56**	0.54**	0.09	0.14*	0.07	0.28**
6. Fear of cardiovascular symptoms						-	0.57**	0.46**	0.12*	0.08	0.07	0.25**
7. Fear of cognitive dyscontrol							-	0.47**	0.20**	0.08	-0.02	0.29**
8. Fear of publicly observable anxiety symptoms								-	0.17**	0.18**	0.05	0.30**
9. Coping Motive									-	0.28**	0.40**	0.20**
10. Social Motive										-	0.48**	0.31**
11. Enhancement Motive											-	0.03
12. Conformity Motive												-

\*  $p < .05$ ; \*\*  $p < .01$

The results of hierarchical multiple regression analyses for each drinking motive are presented in Table 15, including multiple R ( $R$ ), R square ( $R^2$ ), adjusted R<sup>2</sup> ( $\Delta R^2$ ), the standardized regression coefficients-Beta ( $\beta$ ), semipartial correlations ( $sp^2$ ) and  $t$  values for each drinking motive of the last step of the analysis.

After step one, with demographic variables in the equation, age and gender together did not significantly predict Coping Motives,  $F(2, 295) = 2.06$ ,  $p > 0.05$ . After Step 2, age, gender and two subscales of the AUDIT together significantly predicted Coping Motives,  $F(4, 293) = 11.22$ ,  $p < 0.001$ . Addition of the subscale scores of AUDIT to the equation after step two did result in a significant F change. Addition of the subscale scores of ASI-R to the equation after step three did result in a significant F change. Age, gender, two subscales of the AUDIT and subscales of the ASI-R together explained 16.9% of the variance in Coping Motives,  $F(8, 289) = 7.33$ ,  $p < 0.001$ . Examination of the individual variables after step three with all the IV's in the equation revealed that only AUDIT subscales of hazardous alcohol use ( $\beta = 0.16$ ,  $p < 0.05$ ) and symptoms of alcohol dependence ( $\beta = 0.24$ ,  $p < 0.001$ ) had a significant contribution to the prediction of Coping Motives drinking. ASI-R subscales of fear of cognitive dyscontrol ( $\beta = 0.13$ ,  $p < 0.07$ ) and fear of publicly observable anxiety symptoms ( $\beta = 0.12$ ,  $p < 0.06$ ) had a marginally significant contribution to the prediction of Coping Motives.

Social Motives was not significantly predicted by age and gender in Step 1,  $F(2, 295) = 2.22$ ,  $p > 0.05$ . After Step 2, age, gender and two subscales of the AUDIT together significantly predicted Social Motives,  $F(4, 293) = 4.49$ ,  $p < 0.01$ . Addition of the subscale scores of AUDIT to the equation after step two did result in a significant F change. Addition of the subscale scores of ASI-R to the equation after

step three did result in a significant F change. Age, gender, two subscales of the AUDIT and subscales of the ASI-R together explained 9.7% of the variance in Social Motives,  $F(8, 289) = 3.86, p < 0.001$ . After Step 3, with all the IV's in the equation, only AUDIT subscale of hazardous alcohol use ( $\beta = 0.19, p < 0.01$ ) and the ASI-R subscale of fear of publicly observable anxiety symptoms ( $\beta = 0.15, p < 0.05$ ) significantly predicted Social Motives. Age had a marginally significant contribution to the prediction of Social Motives ( $\beta = 0.11, p < 0.10$ ).

In terms of Enhancement Motives, age and gender together did not have significant contribution to the variance in Step 1,  $F(2, 295) = 1.24, p > 0.05$ . After Step 2, age, gender and subscales of the AUDIT together significantly predicted Enhancement Motives,  $F(4, 293) = 15.73, p < 0.001$ . Addition of the subscale scores of AUDIT to the equation after step two did result in a significant F change. After Step 3, with all the IV's in the equation, age, gender, subscales of the AUDIT and subscales of the ASI-R together explained 20.5% of the variance in Enhancement Motives,  $F(8, 289) = 9.33, p < 0.001$ . Addition of the subscale scores of ASI-R to the equation after step three did result in a significant F change. After step three, AUDIT subscales of hazardous alcohol use ( $\beta = 0.35, p < 0.001$ ) and symptoms of alcohol dependence ( $\beta = 0.16, p < 0.01$ ) and ASI-R subscale score of fear of cognitive dyscontrol ( $\beta = -0.19, p < 0.01$ ) significantly predicted Enhancement Motives.

After step one, with demographic variables in the equation, age and gender together significantly predicted Conformity Motives,  $F(2, 295) = 3.98, p < 0.05$ . After step two, age, gender and subscales of the AUDIT together significantly predicted Conformity Motives,  $F(4, 293) = 3.15, p < 0.05$ . However, addition of the

subscale scores of AUDIT to the equation after step two did not result in a significant F change. After Step 3, age, gender, subscales of the AUDIT and subscales of the ASI-R together explained 16.1% of the variance in Conformity Motives,  $F(8,289) = 6.91, p < 0.001$ . Addition of the subscale scores of the ASI-R to the equation after step three did result in a significant F change. After step three, with all the IV's in the equation, gender ( $\beta = 0.12, p < 0.05$ ), and ASI-R subscale scores of fear of cognitive dyscontrol ( $\beta = 0.17, p < 0.05$ ) and fear of publicly observable anxiety symptoms ( $\beta = 0.15, p < 0.05$ ) significantly predicted Conformity Motives. Age ( $\beta = 0.11, p < 0.10$ ), and AUDIT subscale of hazardous drinking ( $\beta = -0.11, p < 0.10$ ) had a marginally significant contribution to the prediction of Conformity Motives.

**Table 15.** Summary of Hierarchical Multiple Regressions using demographics, AUDIT's two subscale scores, and ASI-R lower order factors to predict Drinking Motives

	R	R <sup>2</sup>	ΔR <sup>2</sup>	β	sp <sup>2</sup>	t
<i>Coping Motive</i>						
Age				0.03	0.02	0.45
Gender				0.05	0.04	0.83
Hazardous alcohol use				0.16	0.13	2.49*
Symptoms of alcohol dependence				0.24	0.21	3.99**
Fear of respiratory symptoms				-0.08	-0.05	-0.92
Fear of cardiovascular symptoms				0.03	0.02	0.35
Fear of cognitive dyscontrol				0.13	0.10	1.83 <sup>†</sup>
Fear of publicly observable anxiety symptoms				0.12	0.10	1.86 <sup>†</sup>
Step 1	0.12	0.01	0.01			
Step 2	0.36	0.13	0.12			
Step 3	0.41	0.17	0.15			
Overall F and df for model	7.33**	(8, 289)				
<i>Social Motive</i>						
Age				0.11	0.10	1.79 <sup>†</sup>
Gender				-0.01	-0.01	-0.18
Hazardous alcohol use				0.19	0.17	2.94**
Symptoms of alcohol dependence				0.05	0.05	0.83
Fear of respiratory symptoms				0.13	0.08	1.49
Fear of cardiovascular symptoms				-0.05	-0.03	-0.57
Fear of cognitive dyscontrol				-0.04	-0.03	-0.54
Fear of publicly observable anxiety symptoms				0.15	0.12	2.15*
Step 1	0.12	0.02	0.01			
Step 2	0.24	0.06	0.05			
Step 3	0.31	0.10	0.07			
Overall F and df for model	3.86*	(8, 289)				

<sup>†</sup> p < .10; \* p < .05; \*\* p < .01

**Table 15 (continue).**

	R	R <sup>2</sup>	$\Delta R^2$	$\beta$	sp <sup>2</sup>	<i>t</i>
<i>Enhancement Motive</i>						
Age				-0.09	-0.08	-1.58
Gender				-0.08	-0.07	-1.34
Hazardous alcohol use				0.35	0.30	5.70**
Symptoms of alcohol dependence				0.16	0.14	2.71**
Fear of respiratory symptoms				0.06	0.04	0.80
Fear of cardiovascular symptoms				0.12	0.08	1.48
Fear of cognitive dyscontrol				-0.19	-0.15	-2.81**
Fear of publicly observable anxiety symptoms				0.06	0.05	0.94
Step 1	0.09	0.01	0.002			
Step 2	0.42	0.18	0.17			
Step 3	0.45	0.21	0.18			
Overall F and <i>df</i> for model	9.33**	(8, 289)				
<i>Conformity Motive</i>						
Age				0.11	0.10	1.88 <sup>†</sup>
Gender				0.12	0.11	2.02*
Hazardous alcohol use				-0.11	-0.09	-1.75 <sup>†</sup>
Symptoms of alcohol dependence				0.08	0.07	1.26
Fear of respiratory symptoms				0.10	0.06	1.14
Fear of cardiovascular symptoms				0.01	0.004	0.08
Fear of cognitive dyscontrol				0.17	0.13	2.46*
Fear of publicly observable anxiety symptoms				0.15	0.12	2.20*
Step 1	0.16	0.03	0.02			
Step 2	0.20	0.04	0.03			
Step 3	0.40	0.16	0.14			
Overall F and <i>df</i> for model	6.91**	(8, 289)				

<sup>†</sup> *p* < .10; \* *p* < .05; \*\* *p* < .01.

Note.  $\beta$ , sp<sup>2</sup> and *t* values are representing the values of the last step of the regression analysis.

### 3. 3. Relationship among Alcohol Use, Anxiety Sensitivity and Drinking Motives in Alcohol-Dependent Inpatients

First, data were examined for missing values, and univariate and multivariate outliers, and one case was deleted. Further analyses were conducted by 54 cases. Descriptives for self-reported measures are presented in Table 16.

**Table 16.**

Descriptive Statistics of Self-reported Measures in Alcohol Dependent Inpatients

Measures	M	SD
ASI-R	69.25	29.36
Fear of respiratory symptoms	2.14	0.97
Fear of cardiovascular symptoms	1.57	0.82
Fear of cognitive dyscontrol	1.72	0.98
Fear of publicly observable anxiety symptoms	2.25	0.92
DMQ-R		
Coping Motive	18.24	4.88
Social Motive	14.41	4.70
Enhancement Motive	15.28	4.98
Conformity Motive	8.16	3.00
Frequency of alcohol use	3.70	0.74
Amount of alcohol use	2.22	1.51
Hazardous alcohol use	9.26	2.84
Symptoms of alcohol dependence	7.83	3.77
Harmful alcohol use	9.28	3.74

### 3.3.1. Anxiety Sensitivity, Alcohol Use and Drinking Motives

To examine the relationship between AS and alcohol use, and AS and drinking motives among alcohol dependent inpatients, series of multiple regression analyses could not be performed since there is a problem of multicollinearity. The four lower order factors of the ASI-R were highly correlated in the alcohol dependent inpatient sample ( $r$ s ranging 0.65 – 0.82), which resulted in tolerance values around .30. In addition, sample size is small ( $N = 54$ ). Thus, simple correlations among the lower order factors of the ASI-R, drinking behavior measures and drinking motives were performed. Demographic variables (age and education level) were also included to the analyses to see whether they are related to drinking behavior measures and drinking motives. Pearson correlation coefficients among demographics, the lower order factors of the ASI-R, drinking behavior measures and drinking motives were presented in Table 17.

Pearson correlation coefficients revealed that age was significantly and negatively correlated with frequency of alcohol use ( $r = -0.31$ ,  $p < 0.05$ ) and symptoms of alcohol dependence ( $r = -0.36$ ,  $p < 0.01$ ). In addition, education level was significantly and negatively correlated with amount of alcohol use ( $r = -0.31$ ,  $p < 0.05$ ) and symptoms of alcohol dependence ( $r = -0.32$ ,  $p < 0.01$ ). As can be seen from Table 17, there was not a significant correlation among ASI-R lower order factors and drinking behavior measures (frequency of alcohol use, amount of alcohol use, hazardous alcohol use, symptoms of alcohol dependence and harmful alcohol use). In addition, correlations were weak with  $r$ s ranging from -0.03 to 0.20.

In terms of the relationship between the drinking motives and the ASI-R lower order factors, only the correlation between fear of respiratory symptoms and

Coping Motives was significant ( $r = 0.35$ ,  $p < 0.05$ ). However, as can be seen from Table 17, other correlations between the drinking motives and the ASI-R lower order factors were not significant.

Results revealed that all of the drinking behavior measures, namely frequency [ $r = 0.43$ ,  $p < 0.01$ ] and amount of alcohol use [ $r = 0.38$ ,  $p < 0.01$ ], hazardous alcohol use [ $r = 0.50$ ,  $p < 0.01$ ], symptoms of alcohol dependence ( $r = 0.54$ ,  $p < 0.01$ ), and harmful alcohol use ( $r = 0.45$ ,  $p < 0.01$ ) were significantly and positively correlated with Coping Motives. In addition, frequency of alcohol use [ $r = 0.28$ ,  $p < 0.05$ ] and symptoms of alcohol dependence [ $r = 0.35$ ,  $p < 0.05$ ] were significantly and positively correlated with Enhancement Motives.

Results revealed that age was significantly and negatively correlated with Enhancement Motives ( $r = -0.34$ ,  $p < 0.05$ ).

**Table 17.** Zero-order Correlations among demographics, ASI-R lower order factors, Drinking Behavior Measures and Drinking Motives in Alcohol Dependent Inpatients.

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1. Age	-	0.11	0.16	0.26	0.21	-0.01	-0.31*	-0.10	-0.21	-0.36**	-0.26	-0.26	-0.10	-0.34*	0.07
2. Education level		-	-0.24	-0.28	-0.40*	-0.27	-0.13	-0.31*	-0.21	-0.32*	-0.20	-0.19	0.16	0.08	-0.03
3. Fear of respiratory symptoms			-	0.75*	0.82*	0.68**	-0.03	0.14	0.12	0.12	0.17	0.35*	0.20	0.10	0.02
4. Fear of cardiovascular symptoms				-	0.69*	0.65**	-0.27	-0.06	-0.12	0.07	-0.09	0.14	0.09	0.002	0.05
5. Fear of cognitive dyscontrol					-	0.68**	-0.20	0.20	0.04	0.12	0.09	0.13	0.13	0.003	0.03
6. Fear of publicly observable anxiety symptoms						-	-0.05	0.19	0.18	0.07	0.14	0.26	0.08	0.01	-0.06
7. Frequency of alcohol use							-	0.28*	0.72**	0.52**	0.55**	0.43**	0.04	0.28*	-0.05
8. Amount of alcohol use								-	0.77**	0.38**	0.52**	0.38*	0.03	0.07	0.08
9. Hazardous alcohol use									-	0.58**	0.63**	0.50**	0.003	0.19	-0.03
10. Symptoms of alcohol dependence										-	0.66**	0.54**	0.05	0.35*	0.08
11. Harmful alcohol use											-	0.45**	0.05	0.19	0.09
12. Coping Motives												-	0.33*	0.60**	0.23
13. Social Motives													-	0.47**	0.55**
14. Enhancement Motives														-	0.30
15. Conformity Motives															-

\* p &lt; .05; \*\* p &lt; .01.

### 3.3.2. Drinking Motives

In order to determine whether alcohol dependent patients are different in terms of drinking motives, a one-way within subjects ANOVA was conducted, using four different factors of DMQ-R as within-subjects variables. The results for the ANOVA indicated a significant drinking motive effect,  $F(3, 159) = 79.85, p < 0.001$ . The means and standard deviations of drinking motives for the sample of alcohol dependent patients are presented in Table 18. As can be seen from Table 18, alcohol dependent patients reported using alcohol mostly for Coping, Enhancement, Social, and Conformity Motives, respectively. In order to determine whether the mean scores of four drinking motives were significantly different from each other, follow-up post-hoc tests were conducted. Tukey's HSD test revealed that mean Coping Motive score of alcohol dependent inpatients was significantly higher than that of Social Motive [ $q(4, 159) = 8.08, p < .01$ ], Enhancement [ $q(4, 159) = 6.19, p < .01$ ] and Conformity Motive [ $q(4, 159) = 21.20, p < .01$ ] score. Mean Social Motive score was significantly higher than that of Conformity Motive score [ $q(4, 159) = 13.12, p < .01$ ]. Mean Enhancement Motive score was significantly higher than that of Conformity Motive score [ $q(4, 159) = 15.01, p < .01$ ]. However, mean Social Motive score and Enhancement Motive scores of alcohol dependent patients were not significantly different from each other [ $q(4, 159) = 1.88, p > .05$ ].

**Table 18.**

Descriptive Statistics of Drinking Motives scores of Alcohol Dependent Inpatients

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	M	SD
Coping Motive	18.24 <sup>a</sup>	4.88
Social Motive	14.41 <sup>b</sup>	4.70
Enhancement Motive	15.28 <sup>b</sup>	4.98
Conformity Motive	8.16 <sup>c</sup>	3.00

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Note. Means with different superscripts differ (Tukey's HSD)

## **CHAPTER IV**

### **DISCUSSION**

#### **4. 1. Factor Structure, Validity and Reliability of the ASI-R**

The first purpose of the present study was to examine the factor structure of the Turkish version of ASI-R in a large sample of nonclinical university students.

The factor structure of the ASI-R was first examined by Taylor and Cox (1998b) in a sample of psychiatric patients. They found that the ASI-R has a multidimensional and hierarchical structure with the four lower order factors loaded on a single higher order factor. Deacon et al. (2003), in two large nonclinical samples, again found that the ASI-R consists of four lower order factors which load on a single higher order factor, though they had different factor labels than those of Taylor and Cox (1998b). Overall, the ASI-R factor solution obtained in the present study generally resembled the results of Taylor and Cox (1998b) and Deacon et al. (2003).

In accordance with previous research (Taylor & Cox, 1998b; Deacon et al., 2003), results of the present study yielded four factors. The factors were labeled as: (1) fear of respiratory symptoms; (2) fear of cardiovascular symptoms; (3) fear of cognitive dyscontrol; and (4) fear of publicly observable anxiety symptoms. Hierarchical analysis revealed that these four factors loaded on a single higher order factor. These findings suggested that the Turkish version of the ASI-R has a hierarchically organized multifactorial structure. This hierarchically organized

structure of the ASI-R was consistent with results of previous Turkish studies using other measures of AS. The Turkish versions of ASI and ASP have also been found to have a hierarchical structure (Ayvaşık, 2000; Ayvaşık & Tutarel-Kışlak, 2004). All these findings indicated that AS, as a construct, has a hierarchically organized multifactorial structure.

Results of the factor analysis of the present study were quite similar to those of Taylor and Cox's (1998b) study. First, four lower order factors were found in both of the studies. These four factors were also assigned the same labels across two studies. However, item-factor loadings in the present study were slightly different from their study. Items loaded on factors of 'fear of cognitive dyscontrol' and 'fear of publicly observable anxiety symptoms' were quite equivalent across two studies; however items that loaded on factors of 'fear of respiratory symptoms' and 'fear of cardiovascular symptoms' were not so. For example, in the present study 10 items loaded on Factor I (fear of respiratory symptoms). However, this factor had salient loadings of 12 items in Taylor and Cox's (1998b) study. In the present study 10 items loaded on Factor II (fear of cardiovascular symptoms); however corresponding factor in Taylor and Cox's (1998b) study had salient loadings of 11 items.

Deacon et al. (2003) also attempted to replicate the ASI-R factor structure obtained by Taylor and Cox (1998b). Coefficients of congruence indicated that the ASI-R 'fear of cognitive dyscontrol' and 'fear of publicly observable anxiety symptoms' factors were highly replicable across their study and Taylor and Cox's (1998b). However, they found a less convergence between the other two factors (factors pertaining to somatic symptoms) in their study and those reported by Taylor and Cox (1998b) as similar to the present study.

PCA with oblique (promax) rotation showed that in the present study item-factor loadings of 5 items (item no's 21, 26, 27, 28, and 32) were different from those in Taylor and Cox's (1998b) study. For example, in the present study, Item 21 ("It scares me when my body feels strange or different in some way") loaded on the fear of publicly observable anxiety symptoms factor, while it loaded on fear of respiratory symptoms factor in Taylor and Cox's (1998b) study. It might be that, in Turkish culture, feeling of change in one's own body is understood as social embarrassment. Item 7 ("When my heart beats rapidly, I worry that I might have a heart attack") and Item 19 ("When I feel pain in my chest, I worry that I am going to have a heart attack"), in the present study, had salient loadings on both fear of respiratory symptoms and fear of cardiovascular symptoms factors. However, the same items loaded only on fear of cardiovascular symptoms factor in Taylor and Cox's (1998b) study. Indeed, Ayvaşık and Tutarel-Kışlak (2004) in examining factor structure of ASP in a Turkish sample, found out that some items are cross-loaded on both factors of "fear of respiratory symptoms" and "fear of cardiovascular symptoms". It is possible that in Turkish culture "rapid heart beat" and "pain in chest" may be associated with shortening of breath and hence understood as a respiratory symptom as well. In addition, 4 items are loaded on both fear of respiratory symptoms and fear of cardiovascular symptoms factors. This finding suggests that fear of respiratory and fear of cardiovascular symptoms might not be understood as distinct symptoms in Turkish culture. Indeed, high correlation between these two lower order factors ( $r = 0.73$ ) relative to the correlations among other factors might explain why most of the complex items would load on these factors.

Determining the factor structure of AS may have important implications both for the nature of AS and its role in psychopathology. Different AS dimensions may emerge as a result of distinct learning experiences. Further, different AS dimensions may lead to different types of psychopathology. For instance, factor of ‘fear of cognitive dyscontrol’ was found to be associated with depression (Taylor et al., 1996), whereas factors assessing somatic symptoms (‘fear of respiratory symptoms’ and ‘fear of cardiovascular symptoms’) were found to be associated with panic disorder or anxiety disorders in general (Zinbarg et al., 1997). As similar to the previous studies, it has been found that fear of cognitive dyscontrol factor had the highest correlation with the BDI scores in both university student ( $r = 0.40$ ) and alcohol dependent inpatient ( $r = 0.51$ ) sample (see Table 2).

In summary, in accordance with previous research, the findings of the present study confirmed that the Turkish version of ASI-R has a hierarchically organized multifactorial structure. It appeared that the ASI-R measures four lower order factors assessing fears of respiratory, cardiovascular, cognitive dyscontrol and publicly observable anxiety symptoms. In addition, congruency analysis showed that PCA and PAF solutions were consistent.

The present results revealed that the correlation between the ASI-R and STAI-T was moderate. In addition, the lower order factors of the ASI-R moderately correlated with the STAI-T ( $r$ s in university student sample 0.33-0.44;  $r$ s in alcohol dependent inpatient sample 0.50-0.59). These two findings, in accordance with the literature, indicated that AS and trait anxiety are related but distinct personality traits and provided support for the divergent validity of the ASI-R.

Results also showed that lower order factors of the ASI-R were moderately correlated with each other. Furthermore, lower order factors of the ASI-R had large correlations with the total ASI-R scale. These two findings indicated that the ASI-R has convergent validity.

The internal consistency analysis indicated that the ASI-R has sound psychometric properties. The internal consistency of the whole scale was high ( $\alpha = 0.93$ ), suggesting that all items on the ASI-R correlate sufficiently with the total scale. Cronbach's  $\alpha$  coefficients of the four lower order factors of the ASI-R were above 0.79, which indicated that each subscale of the ASI-R also showed high degree of internal consistency. Moreover, item-total analysis yielded that consistency of each ASI-R items with the rest of the scale was satisfactory. Thus, item-total correlations of each item provided further support for the reliability of the scale. Taken together, these findings indicate that the ASI-R, as well as its four subscales, is a reliable instrument in terms of internal consistency.

A potential limitation of the present study regarding the factor analysis was the use of a university student sample which has a relatively homogeneous demographic composition. Thus, restricted range of scores exhibited by university students might have influenced correlations between variables and thereby results of the present study. Further research is needed to examine the factor structure of the Turkish version of ASI-R in a sample which is more representative of the general population and in clinical samples. Future research should find out whether the factor structure of the Turkish version of ASI-R is the same with diverse samples of students, community adults, and patients with various anxiety disorders.

Future research should also determine whether these four factors differ in their associations with different types of psychopathology. For instance, individuals with a diagnosis of social phobia would be more likely to have a higher score on factor of “fear of publicly observable anxiety symptoms” than on other factors. Also, individuals with a diagnosis of panic disorder are more likely to have higher scores on factors assessing fears of somatic harm, namely “fear of cardiovascular symptoms” and “fear of respiratory symptoms” than on other factors has been demonstrated previously (Zinbarg et al., 1997). Individuals with panic disorder may also have high scores on “fear of cognitive dyscontrol” factor, since fear of going crazy (insanity) and fear of losing control are among the symptoms of panic disorder (APA, 1994). Thus, calculating subscale scores in addition to ASI-R total score may be helpful in clinical assessment.

## **4. 2. Relationship among Alcohol Use, Anxiety Sensitivity and Drinking Motives in University Students Using Alcohol**

### **4. 2. 1. Gender Differences on Self Reported Measures**

At the beginning of the present study it was predicted that female students would score significantly higher than male students on the ASI-R and its lower order factor scores. Results indicated that although the mean ASI-R total score of female university students is slightly higher than that of male university students, they did not differ significantly from each other. In addition, male and female students did not differ significantly from each other on ASI-R four lower order factor scores. Although having failed to reach statistical significance, females scored higher than males on the ASI-R lower order factor scores of “fear of respiratory symptoms”,

“fear of cardiovascular symptoms” and “fear of cognitive dyscontrol”. On the other hand, males scored higher than females on “fear of publicly observable anxiety symptoms”. Relatively high levels of AS “social concerns” among men as compared to women have been found in other studies as well (e.g., Stewart, Conrod, Gignac, & Pihl, 1998; Stewart et al., 1997). Consistent with the present results, Durmuş-Sandler (2001) also failed to find a significant difference between university men and women on the Turkish version of the ASI-R. She also examined possible gender differences on the six subscales of the ASI-R that the scale originally designed to measure. The only significant difference they found was on fear of dissociative and neurological symptoms. Women scored significantly higher than men on this subscale. The present finding of no gender differences on AS levels measured by the ASI-R between females and males is consistent with the findings of previous studies using the ASI (Peterson & Reiss, 1992). Cox et al. (1991), Stewart et al. (1997), Messenger and Shean (1998), Ayvaşık (2000) and Novak et al. (2003) obtained evidence that females and males did not differ on their ASI scores. On the other hand, contradicting to the present results, there are studies which found gender differences on the ASI-R. Deacon et al. (2003) found that ASI-R total scores for university women were significantly higher than those for men.

Results showed that mean frequency and amount of alcohol use, and hazardous alcohol use score of male students were significantly higher than those of female students. However, no significant gender differences were found on symptoms of alcohol dependence score. The finding that mean frequency and amount of alcohol use scores of male students were significantly higher than those of female students is consistent with previous research. Volk et al. (1997) demonstrated

that among non-problem drinkers males drink more alcohol both in frequency and in amount. Similarly, Topuz (2004) found that in a large sample of Turkish university students, males drink more than females both in frequency and quantity. A number of studies including university students showed that male students drink more than female students (i.e., Uslanmaz, 1993; Çakıroğlu, 1998; Cox et al., 2002). AUDIT's subscale of hazardous alcohol use assesses rate of alcohol consumption which, if persists, resulted in harm

(<http://www.prodigy.nhs.uk/ProdigyKnowledge/PatientInformation/Content/pils/plaudit.htm>). Thus, the obtained gender difference on hazardous alcohol use implied that male students drink higher levels of alcohol that may result in harm as compared to female students. Hence, this indicated that male students in the present study, although their drinking might not necessarily resulted in harm, are at greater risk for hazardous alcohol use or harm caused by alcohol use than female students. Moreover, this subscale is used to measure alcohol consumption (i.e., Zvolensky, Kotov, Antipava, Leen-Feldner, & Schmidt, 2005) and hence the gender difference on this subscale constituted another support for the finding that males use alcohol more than females in amount. This is also consistent with previous research finding that alcohol consumption rates are higher among men as compared to women (Farrell et al., 2001).

Results of the present study showed that female and male students did not differ on their scores of symptoms of alcohol dependence. AUDIT's subscale of 'symptoms of alcohol dependence' is about alcohol dependence and high scores on this subscale indicate the presence of alcohol dependence

(<http://www.prodigy.nhs.uk/ProdigyKnowledge/PatientInformation/Content/pils/plaudit.htm>). So, this subscale assesses a more severe pattern of alcohol use than do the other two subscales of AUDIT. Examination of the research data revealed that a substantial percent of the students had a score of zero from this subscale (173 out of 298 (58.1%) students). Alcohol dependence which emerges after a prolonged and heavy alcohol use might not be related with university students. Thus, failure to find a gender difference on this subscale was not surprising.

Male students scored significantly higher than female students on negative reinforcement drinking motives of Coping and Conformity. Similarly, Klein (1992) found that males scored significantly higher on negative reinforcement drinking motives than females in a college student sample. Since Coping Motives involve the use of alcohol to avoid or reduce negative affective states (Cooper et al., 1992), the present finding indicated that males are more likely to drink alcohol to forget their worries or other negative affective states, whereas females less likely to drink for Coping Motives. The finding of gender difference on Coping Motives is consistent with previous research findings. Cooper et al. (1992) found that men reported more frequent drinking for Coping Motives than did women. Park and Levenson (2002) examined drinking to cope among a large sample of university students and they, too, found that men rely on alcohol to cope more than women do. Among students (23 years in mean age) men scored higher on Coping Motives than women (Gire, 2002). Topuz (2004) who examined drinking motives among university students found that men drink alcohol for Coping Motives more than women do. Furthermore, considering the finding that Coping Motive is associated with alcohol-related problems (i.e., alcohol abuse / dependence) and lifetime prevalence rate of alcohol

dependence and alcohol-related problems is more than twice as high in men than women (WHO, 2005), it is conceivable that Coping Motive is a more prevalent drinking motive for men than women. On the other hand, there is some research which indicated that drinking to cope might be a more prevalent motive for women (Stewart et al., 2001; Thombs et al., 1993a).

The present finding of male students drink alcohol for Conformity Motives more than females do is also consistent with previous research. Topuz (2004) found that male university students reported drinking for Conformity Motives more than female students do. Likewise, in an earlier study, Lo (1995) found significant gender differences on Conformity Motives, showing that men were more susceptible to peer influence in drinking behavior than were women. Cooper (1994) found that among adolescents males reported drinking for Conformity Motives more than females.

The findings that male students reported more amounts of alcohol use and more negative reinforcement drinking motives seemed to also be consistent with each other. In an earlier study, Farber, Khavari, and Douglass (1980) demonstrated that people scored high on negative reinforcement drinking motives drink more amounts of alcohol than those scored low on negative reinforcement motives.

#### **4. 2. 2. Anxiety Sensitivity and Alcohol Use**

It was expected that students with high AS would score significantly higher on alcohol use measures than those with moderate and low AS. Contrary to the prediction, AS group effect was not observed for frequency of alcohol use, amount of alcohol use, and AUDIT's subscales of hazardous alcohol use and symptoms of alcohol dependence. This suggests that, in the present sample of university students,

levels of AS could not differentiate (or predict) self-reported rates of alcohol use. These findings are consistent with a study carried out by Merrill (2000). She found that in a sample of university students there were no differences between the high and low AS groups on self-reported quantity or frequency of alcohol consumption. She further found that AS scores were not even related to any of the consumption variables. On the other hand, the present findings contradicted the findings of Stewart et al.'s (1995) who found that female college students with high AS drank more than females with low AS. The present findings are also in conflict with Stewart et al. (2001) study that reported that high AS students reported a higher typical weekly drinking frequency than did the moderate and low AS students, and high AS students reported a higher yearly excessive drinking frequency than did the low AS students. However, similar to the present results, they found that levels of AS did not significantly affect students' drinking quantity.

The present finding of no significant effect of AS levels on alcohol use may be explained in two ways. First, in literature the direct relationship between AS and alcohol use is not that robust. Rather, research findings indicated relatively more robust relationship between AS and drinking motives (see Forysth et al., 2003). Moreover, Samoluk et al. (1999) found that high AS nonclinical young adults consumed more alcohol only in a solitary context (when they are alone) than those with low AS. Therefore, the present failure of effects of AS levels on alcohol use might stem from the unique drinking motives (enhancement and social) university students do prefer. These two drinking motives of students might have acted protective even though among students who have moderate or high levels of AS.

In addition, hierarchical regression analyses revealed that after controlling for demographic variables, lower order factors of AS measured by the ASI-R did not significantly predict frequency of alcohol use, amount of alcohol use and symptoms of alcohol dependence. Only hazardous alcohol use was significantly predicted by the combination of demographic variables and ASI-R lower order factors. Even the contribution of all four lower order factors of the ASI-R was not significant, fear of cognitive dyscontrol predicted a significant variance on hazardous alcohol use. The present findings are consistent with Novak et al.'s (2003) finding which demonstrated that AS did not significantly predict level of alcohol consumption in university student drinkers. Also, Stewart et al. (2001) found that ASI lower order factors did not significantly predict alcohol quantity of university students. In a recent study by Zvolensky et al. (2005) AS was not found to predict alcohol consumption and alcohol-related problems assessed by the AUDIT. In contrast to the present findings, some research found evidence that AS is associated with drinking behavior (Stewart et al., 1995; Stewart et al., 2001). For instance, Stewart (1993) found that AS is an important predictor of self-reported rates of alcohol consumption in university women. Moreover, Stewart et al. (1995) demonstrated that AS accounts for about 18.7% of the variance in weekly alcohol consumption.

Only a few studies examined the relationship between drinking behavior and various lower order components of AS (i.e., McWilliams & Asmundson, 1999; Stewart et al., 2001; Koven et al., 2005). Consistent with the present results, McWilliams and Asmundson (1999) in a sample of university students found that AS did not account for significant variance in any of the drinking measures (average number of drinking occasions per week, average number of drinks consumed during

a drinking occasion, average number of alcoholic drinks consumed per week and average frequency of intoxication per month). Moreover, they found that fear of publicly observable anxiety symptoms, but not fear of cognitive dyscontrol or fear of physical symptoms, had a significant but weak correlation with amount of alcohol use and monthly intoxication. Similar to McWilliams and Asmundson's (1999) study, the present study showed that most of the correlations between AS components and drinking behavior measures were not significant. Only one AS dimension, fear of cognitive dyscontrol had a significant but weak correlation with symptoms of alcohol dependence. Stewart et al. (2001) also demonstrated that the AS lower order components and alcohol quantity were not significantly correlated.

The findings that fear of cognitive dyscontrol predicted a significant variance on hazardous alcohol use was parallel to previous research. Koven et al. (2005) again found that only one AS dimension, fear of cognitive dyscontrol, was associated with self-reports of symptoms of alcohol dependence and problematic drinking behaviors. On the other hand, Stewart et al. (2001) found that only the fear of publicly observable anxiety symptoms predicted a significant variance on increased drinking behavior.

The present finding that only fear of cognitive dyscontrol explained a significant variance of drinking behavior (hazardous alcohol use) may have some implications. AS might function as an anxiolytic which let people who have fears about getting out of control, to feel more in control and thus feel better. Hence, such people might use alcohol for a perception of self-control. In addition, the relationship between fear of cognitive dyscontrol and depression should be taken into account in

further studies. Depression might be a mediator in the relationship between alcohol use and fear of cognitive dyscontrol.

The present results failed to support the relationship between AS and alcohol use. The present failure of AS to predict drinking behavior likely be resulted from nonclinical university student sample properties. It might be that the AS is a more salient predictor of alcohol consumption in clinically anxious groups, particularly in panic-disordered patients which was reported by Cox et al. (1993).

#### **4. 2. 3. Anxiety Sensitivity and Coping Motives as a Predictors of Alcohol Use**

Coping Motives is the motive that best fits to the tension reduction theory of alcohol use. Indeed it has been suggested that coping-related drinking is more likely related to the tension-reduction and self-medication theories of alcohol use / abuse (Cappell & Greeley, 1987; cited in DeHaas et al., 2002). AS, as fear of anxiety symptoms, may lead to negative affect. In order to reduce negative affect, people might use alcohol with Coping Motives. In order to examine this, it was hypothesized that lower order factors of the ASI-R and Coping Motives together predicted drinking behavior measures.

Results revealed that demographic variables, BDI, ASI-R lower order factors and Coping Motives together significantly predicted frequency of alcohol use, amount of alcohol use, hazardous alcohol use and symptoms of alcohol dependence of students. For each of the regression analysis for each drinking behavior measure, addition of the subscale scores of the ASI-R to the equation after Step 2 did not result in a significant F change. As discussed in the pervious section of 4. 2. 2., this is consistent with the present study's failure to demonstrate that AS significantly

predicts alcohol use. However, after controlling for demographics, BDI and ASI-R lower order factors, Coping Motives explained a significant variance in each alcohol use measure, namely frequency of alcohol use, amount of alcohol use, hazardous alcohol use and symptoms of alcohol dependence of students. This significant contribution of Coping Motives to alcohol use is consistent with previous findings that Coping Motive is associated with heavier alcohol consumption, preoccupation with drinking, worries about controlling drinking and more severe alcohol-related problems (i.e. abusive drinking) (Cooper et al., 1992). This finding, also, constitutes another support for the evidence that drinking motives in general contribute to alcohol consumption, frequency of alcohol use and problems in university students (i.e., Read et al., 2003; Carey & Correia, 1997; Stewart & Zeitlin, 1995).

Examination of the individual variables in the last step of each regression analysis revealed that only ASI-R subscale of fear of publicly observable anxiety symptoms significantly predicted frequency of alcohol use. Stewart et al. (2001) also found that, of the AS lower order components, only fear of publicly observable anxiety symptoms predicted a significant variance in increased drinking behavior. The present finding that fear of publicly observable anxiety symptoms predicted a significant variance in frequency of alcohol use, even when the Coping Motives is in the equation is important. More studies are needed to clarify this issue. Yet, these findings in general supported the conclusion that the association between AS and coping-motivated drinking is more robust than that of between AS and alcohol use. Since in each regression analyses Coping Motives significantly predicted alcohol use measures whereas ASI-R lower order factors generally did not have significant contributions to alcohol use.

#### **4. 2. 4. Alcohol Use, Anxiety Sensitivity and Drinking Motives**

Consistent with the hypothesis, results of the present study revealed that for university students, Enhancement was the first common motive, which was followed by Social, Coping, and Conformity Motives. This sequence is consistent with the four categories of drinking motives proposed by Cooper et al. (1995) that starts from internal and external positive reinforcement (drinking to enhance positive mood and drinking to obtain a positive social reward) and continue to internal and external negative reinforcement motives (drinking to reduce negative affect and drinking to avoid social rejection). Parallel to the present results, a number of researchers (e.g., Cooper, 1995; Carrigan et al., 1998) showed that university students drink more in positively reinforcing situations than in negatively reinforcing situations. Klein (1992) evaluated reasons for drinking and found that college students gave the strongest endorsements to liking the taste of alcohol and drinking to celebrate special occasions. In a Canadian study, most college students drank to enjoy the taste (24.9%), to celebrate (21.3%) or to be sociable (16.9%), whereas only 2.1% drank to forget worries or to feel less shy (Kairouz et al., 2002).

The finding that Social Motives were the second common drinking motive among university students is consistent with literature. Research indicated that social factors play a central role in university students' drinking (Stewart et al., 1996; Simons, Correia, & Carey, 2000). University students are likely to engage in shared social occasions and activities which may facilitate social-motivated drinking. Therefore, it is not surprising that Social Motives are particularly salient for university students in the present study. Furthermore, the students' age ranged between 17 and 31, which represents a young population. Indeed, a number of

studies showed that most young people drink for Social Motives (e.g., Cooper, 1994; Kairouz et al., 2002; Windle, 1996).

The present finding on university students' drinking motives is also consistent with previous Turkish literature. Delikaya (1999) studied high school students and Dur (1994) studied university students and both found that majority of students drink for enhancement reasons like for fun or pleasant feeling and the less were drinking for negative reinforcement motives (coping-conformity) like to forget their problems or to fit in to a group. In accordance with the present finding, Topuz (2004) examined drinking motives in a sample of 1585 university students and she found that students reported using alcohol mostly for Enhancement, Social, Coping, and Conformity Motives, respectively.

The present finding that Conformity was the least reported drinking motive among university students is consistent with previous research. Kairouz et al. (2002) assessed reasons for drinking in 8864 university students and their results revealed that to comply with others was the least reported reason (6.0 %) as the primary motivation for drinking. In a recent study, Mohr et al. (2005) showed that Conformity Motives were the least strongly endorsed drinking motives, which counterstands the common assumption that students drink in response to social norms (i.e., Perkins, 2002). Furthermore, university students in the present study might have specific personality characteristics of self-directiveness and self-consciousness who might not conform to others easily. Hence, although the social life and social occasions are important for them, alcohol might not be as a tool for them to conform to others.

At the beginning of the study it was predicted that students with high AS

would report more negative reinforcement drinking motives (Coping and Conformity) than those with moderate and low AS. The results supported the hypotheses that AS levels significantly affected negative reinforcement drinking motives. Consistent with the present results, previous research showed that high AS individuals display “risky” drinking motives (Coping and Conformity Motives) as measured by the three-factor DMQ (Cooper et al., 1992) or its revised four-factor version of DMQ-R (Cooper, 1994).

As expected, one-way ANOVA results revealed that students’ AS levels significantly affected their coping-motivated drinking. Students with high AS reported alcohol use for Coping Motives more than those with moderate and low AS. Empirical research pointed out that high AS may be related to alcohol use via its association with “risky” drinking motives (see Stewart et al., 1999). Coping Motive was defined as a risky drinking motive by Cooper (1994). Hence, Coping Motive as a risky drinking motive might be a more prevalent drinking motive of high AS individuals as compared to moderate and low AS individuals. In literature, the association between AS and alcohol use is sometimes explained by tension-reduction theory of alcohol use (e.g., Stewart et al., 1997). Coping Motive, then, fits best to this explanation. Indeed, coping-related drinking is more likely related to the tension-reduction and self-medication theories of alcohol use / abuse (Cappell & Greley, 1987; cited in DeHaas et al., 2002). Coping Motive is associated with using alcohol to reduce negative affective states (e.g., to forget one’s worries) (Cooper et al., 1995). People with high AS have fears about their anxiety symptoms and this preoccupation of their anxiety symptoms might lead to negative feelings. Thus, people with high levels of AS may experience negative affect and use alcohol for

reducing such negative feelings (via negative reinforcement) that is to cope with such feelings. Parallel to the present findings, Stewart (1993) showed that high AS university students are more likely to report drinking alcohol primarily to cope than are low AS university students. Samoluk et al. (1999) also have found that in a sample of nonclinical adults high AS individuals are more likely than low AS individuals to report coping-motivated alcohol use.

As expected, results revealed that students with high AS reported alcohol use for Conformity Motives more than those with moderate and low AS. Conformity Motives involves drinking to avoid aversive external consequences such as social embarrassment (Cooper, 1994). ASI-R lower order factor of “fear of publicly observable anxiety symptoms” is associated with fears of social embarrassment, ridicule, etc. A person high on this dimension might fear that other people notice their anxiety or what other people think about them when they experience anxiety symptoms. Hence, the sources of their fears are based on external factors. Thus, a person high on this dimension might be likely to drink for Conformity Motives, which is an external negative reinforcement motive. Indeed, the correlation between Conformity Motives and “fear of publicly observable anxiety symptoms” is higher than that of the correlation between Conformity Motives and the other three ASI-R lower order factors (see Table 14). Moreover, given the associations between AS and social anxiety (Ball et al., 1995), the high AS individuals may feel anxious in the presence of others. In order to avoid social rejection or to fit into a group, they are likely to use alcohol for Conformity Motives.

Results showed that students’ AS levels significantly affected their social-motivated drinking. Students with high AS reported alcohol use for Social Motives

more than those with moderate and low AS. Although Social Motive is not a negatively reinforced drinking motive and not defined as a risky drinking motive, AS levels significantly affected students' scores on this motive. Indeed, a study showed that ASI-R total score was related to positively reinforced drinking assessed by the higher order factor of the Inventory of Drinking Situations (Lawyer et al., 2002). The social context of the university environment has been found to be related with heavy alcohol use, such that social-motivated alcohol use is a relatively normative (i.e., Perkins, 2002). Drinking to obtain a positive social reward (Social Motives) might be important for students who have fears of social concerns. However, in contrast to the present findings, some studies found that students with low AS drink primarily for Social Motives (Comeau et al., 2001; Stewart et al., 1997; Stewart et al., 1995).

Results showed that students' AS levels did not significantly affect their enhancement-motivated drinking. According to Cooper et al. (1995) Enhancement Motive is a positive reinforcement drinking motive and involves drinking to increase positive mood or to have fun. Moreover, Enhancement Motives Subscale does not contain items that refer to bodily sensations or feelings of excitement. Indeed, Stewart and Zeitlin (1995) found that ASI scores were not to be related in a linear fashion to scores on the Enhancement Motives in university students. Therefore, it is not surprising that in the present study AS levels did not affect students' enhancement-motivated drinking.

At the beginning of the study, it was expected that drinking motives will be predicted by the lower order factors of the ASI-R. In general, consistent with the prediction, after controlling for demographic variables and drinking behavior variables (hazardous alcohol use and symptoms of alcohol dependence), lower order

factors of the ASI-R significantly predicted all four drinking motives. Specifically, fear of cognitive dyscontrol and fear of publicly observable anxiety symptoms had marginally significant contributions to the prediction of Coping Motives. Several other studies (i.e., Novak et al., 2003) have shown that AS predicts Coping Motives for alcohol use in university students (see review by Stewart et al., 1999). The present results determined which aspects of AS, though marginally, contributed to Coping Motives. It appears that other than fear of cognitive dyscontrol, fear of publicly observable anxiety symptoms was important in coping-motivated drinking. This is important since this component has been found to largely explain the association between AS and increased drinking behavior in university students (Stewart et al., 2001).

Conformity Motives were significantly predicted by fear of cognitive dyscontrol and fear of publicly observable anxiety symptoms. AS lower order factor, fear of cognitive dyscontrol has already shown to be important in the drinking behavior of university students (i.e., Koven et al., 2005). Significant contribution of fear of publicly observable anxiety symptoms is also not surprising. Conformity Motives involves drinking alcohol to avoid aversive external consequences such as social embarrassment (Cooper, 1994). ASI-R lower order factor of fear of publicly observable anxiety symptoms involves fears of anxiety symptoms that lead to negative social consequences (i.e., embarrassment). So, considering this overlap, it is conceivable that this component of AS significantly predict Conformity Motives. A study showed that high AS predicted Conformity Motives for alcohol use among adolescents (Comeau et al., 2001). Also, Stewart et al. (2001) demonstrated that AS significantly predict conformity-motivated drinking of college student drinkers. The

present study adds further knowledge to this established AS-Conformity Motives relationship by showing which component of AS predicts Conformity Motives.

Social Motives were significantly predicted by fear of publicly observable anxiety symptoms. This is conceivable since this factor regards fears of social concerns. Drinking for Social Motives involves drinking in social situations with other people (Cooper, 1994). Hence, it is not surprising that fear of publicly observable anxiety symptoms which is closely related with social concerns explained a significant variance of Social Motives.

Enhancement Motives were significantly predicted by fear of cognitive dyscontrol. Comeau et al. (2001) found that low AS predicted Enhancement Motives for alcohol use among nonclinical individuals. Moreover, considering that this lower order factor found to predict drinking behavior of university students (Koven et al., 2005) and that it also predicted Coping and Conformity Motives in the present study, a significant contribution of this factor to Enhancement Motives is not surprising.

In general it appears that ASI-R lower order factors predict all four drinking motives in university students. Previous research has already shown that AS is a predictor of Coping and Conformity Motives (Conrod et al., 1998; Stewart et al., 1997). The present study demonstrated that, among university students, ASI-R lower order factors were predictive of positive reinforcement drinking motives (Social and Enhancement) as well.

### **4. 3. Relationship among Alcohol Use, Anxiety Sensitivity and Drinking Motives in Alcohol Dependent Inpatients**

#### **4. 3. 1. Anxiety Sensitivity, Alcohol Use and Drinking Motives**

Contrary to expectations, lower order factors of the ASI-R did not significantly correlated with alcohol use behavior (frequency of alcohol use, amount of alcohol use, hazardous alcohol use, symptoms of alcohol dependence and harmful alcohol use) among alcohol dependent patients. Various factors may have contributed to the failure to find a significant relationship, including small sample size and medication treatment of alcohol dependent sample. Medication treatment could have lessened AS profiles of alcohol dependent inpatients. Some of these issues were discussed in the limitations of the study section.

Kushner et al. (2001) found support for a significant relationship between AS and alcohol use in panic disordered patients who use alcohol. Thus, AS-alcohol use relationship may be more salient in clinical groups of comorbid alcohol use disorders and anxiety disorders.

Results revealed that fear of respiratory symptoms significantly and positively correlated with Coping Motives among alcohol dependent inpatients. This might be explained by the tension-reduction theory of alcohol use. People with alcohol dependence may use alcohol for its anxiolytic properties to reduce their symptoms related to physiological tension (i.e., fear of respiratory sensations). Moreover, exhibiting withdrawal symptoms to alcohol is amongst the symptoms of alcohol dependence and these include tremors, nausea, sweating and autonomic hyperactivity (i.e., heart beat of over 100) (DSM-IV, 1994) which exhibit themselves by somatic sensations. Hence, it is conceivable that fear of respiratory symptoms, which is

associated with somatic sensations, was positively related with coping-motivated drinking among alcohol dependent inpatients. Indeed, Kushner et al. (2001) found that AS and withdrawal symptoms were significantly positively correlated in an alcohol dependent sample. Moreover, since fear of respiratory symptoms was found to be associated with anxiety disorders (Zinbarg et al., 1997), possible syndrome-related anxiety experiences alcohol dependent patients have, might have contributed to this association of fear of respiratory symptoms and Coping Motives. Consistent to the present results, DeHaas et al. (2001) found a significant relation between AS and alcohol use in negative situations (to cope) in a sample of clinical alcohol abusers.

Contrary to the expectations, other three lower order factors of the ASI-R (fear of cardiovascular symptoms, fear of cognitive dyscontrol and fear of publicly observable anxiety symptoms) did not significantly correlate with Coping Motives. Forsyth et al. (2003) in a sample of substance abuse disordered inpatients failed to find a significant relationship between high AS and alcohol use to dampen aversive arousal sensations (to cope). Forsyth et al. (2003) further found that in addition to AS, emotional avoidance and perceived uncontrollability are common characteristics of patients seeking residential substance abuse treatment. Thus, it might be that in the present study, other than the AS, these factors might have contributions to coping-motivated drinking of alcohol dependent patients. Kushner et al. (2001) showed that the relationship between AS and Coping Motives reduced substantially when the relationship between AS and anxiety symptoms and anxiety symptoms and Coping Motives were controlled among alcohol dependent patients. They concluded that effects of AS on coping-motivated drinking might be indirect. In the present study anxiety symptoms might have intervened in the association between AS and Coping

Motives as well. In addition, medication treatment of alcohol dependent patients could have possibly lessened anxiety levels of patients, hence this might have affected the relationship between AS and Coping Motives.

Results revealed that lower order factors of the ASI-R were not significantly correlated with Social, Enhancement and Conformity Motives. AS was not found to be related to positive situation of substance use, such as elevating positive mood or increasing satisfaction from interpersonal relationships (DeHaas et al., 2001). From this aspect, it is not surprising that in the present study, Enhancement and Social Motives were not significantly correlated with the ASI-R lower order factors among alcohol dependent patients. Conformity Motives was not found to be a common drinking motive of alcohol dependent inpatients in the present study. Hence, it is not surprising that lower order factors of the ASI-R did not have significant correlations with this motive.

#### **4. 3. 2. Drinking Motives**

Results showed that alcohol dependent patients drink more for Coping Motives which was followed by Enhancement, Social and Conformity Motives. This suggests that they drink for internal (either the positive or negative reinforcement) drinking motives more likely than do for external drinking motives. Hence, whatever the aim is either to increase positive mood or to decrease negative affect, the subject of their expectations is internal. According to the motivational model of alcohol use, the decision to drink is made on the basis of the change that the person expects to achieve by drinking compared with not drinking (Cox & Klinger, 1988). Hence, it can be said that alcohol use serves a specific function of affective change, rather than

to gain a social reward or to avoid social rejection among alcohol dependent patients. Also, it seems that this affective change among alcohol dependent patients (tension reduction or mood enhancement) is related to the direct effects of alcohol, rather than indirect effects (i.e., peer acceptance) (Kuntsche, Knibbe, Gmel, & Engels, 2005). Indeed, it has also been found that internally generated motives (Enhancement and Coping) that strongly related with personality traits (Enhancement with extraversion, Coping with neuroticism) are more consistently related to alcohol use than externally generated motives (Cooper, 1994; Kairouz et al., 2002).

Coping Motives were the most common drinking motives among alcohol dependent patients in the present study. Indeed, all of the drinking behavior measures were significantly and positively correlated with Coping Motives in alcohol dependent sample (see Table 17). In an earlier study Selzer et al. (1977) found that men with a diagnosed alcohol use disorder were more likely to drink when depressed, nervous or tense than comparison groups. The present results are consistent with previous research that DSM-IV diagnosed alcohol-dependent drinkers were found to demonstrate a high level of drinking to cope (Carpenter & Hasin, 1998b; Carpenter & Hasin, 1999). Moreover, Carpenter and Hasin (1998a) in a prospective study of non-alcohol disordered drinkers showed that drinking to cope with negative affect predicted a DSM-IV alcohol dependence diagnosis at a 1-year follow-up. Coping Motives have also been found to differentiate those who have an alcohol abuse treatment history from those who do not (Carey & Carey, 1995).

Enhancement Motive was the second common drinking motive among alcohol dependent patients. Infact, Enhancement Motive was significantly and positively correlated with drinking behavior measures in alcohol dependent sample.

As can be seen from Table 17, frequency of alcohol use and symptoms of alcohol dependence were significantly and positively correlated with Enhancement Motives. Indeed, Kairouz et al. (2002) demonstrated that Enhancement Motives in the sense of feeling the effects of alcohol appear to be highly endorsed by heavy drinkers. Some studies found that, in addition to Coping Motives, Enhancement Motives were a second predictor for alcohol problems (Cooper, 1994; Cooper, Agocha, & Sheldon, 2000), whereas some failed (Read, Wood, Kahler, Maddock, & Palfu, 2003). So, the findings on Enhancement Motives' relation to alcohol-related problems seem to be inconsistent. Enhancement Motives were the most common and second common drinking motive among university students and alcohol dependent patients, respectively in the present study. This may be explained by different items on the scale. Enhancement Motive scale contains items that are related to drinking for enjoyment or to make a party more enjoyable, which might likely to be amongst the drinking reasons of students. On the other hand, the scale also contains items related to drinking to get drunk or feel high which are likely to be associated with heavy drinking, and hence might likely to be amongst the drinking reasons of alcohol dependent patients. Infact, Mohr et al. (2005) have found that positive mood predicts more drinking at home as time with friends decreases. Therefore, Mohr et al. (2005) suggested that although the Enhancement Motives were thought to be social, there may be nonsocial aspects to enhancement drinking. From this point, it can be said that people may drink alcohol with Enhancement Motives when they are alone (i.e., at home) as well. Thus, this kind of enhancement-motivated drinking may be prominent among alcohol dependent patients in the present study.

Results showed that alcohol dependent patients in the present study reported

drinking mostly for Coping and Enhancement Motives. However, the primary and most common drinking motive of alcohol dependent patients was Coping Motive. Indeed, some studies found a strong association between Enhancement Motives and alcohol problems on the bivariate level that did not remain significant when adjusting for Coping Motives in multiple analyses (Carey & Correia, 1997). Cooper et al. (1995) again found that when Coping Motives are controlled, the direct association between Enhancement Motives and alcohol problems is likely to lessen or vanish. On the other hand, Galen, Henderson and Coovert (2001) found that Enhancement Motives have direct effects on problematic drinking as well as indirect (via alcohol consumption) effects. Stewart (1999) found that in an alcohol treatment sample, those who have high Enhancement Motives will be more likely to develop Coping Motives as their drinking progresses and causes problems. Thus, the present finding that alcohol dependent patients reported mostly Coping Motives which was followed by Enhancement Motives is consistent with Stewart's (1999) finding. This pattern of drinking might be characteristic of alcohol dependent patients for whom initial drinking may be motivated by the desire to enhance positive states (Enhancement Motives), but will result in negative outcomes in the long run which may be motivated to reduce negative affect (Coping Motives) afterwards and become as primary.

Among four drinking motives, Social Motive is the only drinking motive that is associated with non-problematic drinking and was found unrelated to heavy drinking (Cooper, 1994). Similarly, Kassel et al. (2000) reported that Social Motives were not a significant predictor of drinking problems. Thus, it is not surprising that patients in the present study who have become alcohol dependent after a heavy and

prolonged period of drinking reported Social Motives as the second least likely drinking motive.

Farber et al. (1980) in an alcoholic sample found that individuals had high scores on negative reinforcement drinking motives. However, in the present study, Conformity Motives were the least likely reported drinking motives in alcohol dependent patients as in university students. Cooper's (1994) research has shown that although Conformity Motive is a risky drinking motive and associated with negative affect, it has an inverse association with quantity and frequency of alcohol consumption. Thus, it is conceivable that this drinking motive is the least likely reported drinking motive among alcohol dependent patients, who have had already high quantity and frequency of alcohol consumption. Moreover, this motive involves fitting to a group or conforming to others, which might not appear as desirable for the alcohol dependent patients, as like most of the people.

#### **4. 4. General Discussion and Conclusions**

The current study examined the relationship among AS, alcohol use and drinking motives in university student drinkers and alcohol dependent inpatients. In general, the results from the present study do not support the hypothesis that AS is a useful concept in the understanding of alcohol use in university students and alcohol dependent patients. The present results indicated that lower order factors of the AS do not significantly predict drinking behavior in university students. In addition, lower order factors of the AS did not significantly relate to alcohol use measures among alcohol dependent inpatients.

On the other hand, results from the present study demonstrated that levels of AS plays an important role in the drinking motives (Coping, Conformity and Social) of university students. Particularly the present finding that levels of AS affected coping-motivated drinking in university students has important implications. A handful of previous studies have suggested that high AS may be related to greater tension-reducing effects from alcohol use (i.e., Stewart et al., 1996). The finding that those with high AS drink to cope more often than do those with moderate and low AS might stand as a support of tension-reduction theory of alcohol use. The results of the present study, particularly in the student sample, indicated that the relationship between AS and drinking motives is more robust than the relationship between AS and alcohol use. Indeed, this is consistent with Novak et al.'s (2003) finding that AS was not related to levels of alcohol use but was related to drinking motives. AS, which consists of beliefs about harmful consequences of anxiety symptoms might directly influence self-perceived drinking motives (i.e., Coping Motive), which are also based on cognitive interpretations (expectations and beliefs about consequences of drinking or not drinking). Alcohol use, as a last step (behavior) in this sequence might be directed by these drinking motives. Similarly, the present study failed to find a significant relationship between AS and alcohol use among alcohol dependent inpatients. However, it was found that one AS lower order factor (fear of respiratory symptoms) was significantly and positively correlated with coping-motivated drinking in these individuals. It might be that, as in university students, in alcohol dependent inpatients, the association of AS and coping-motivated drinking may be more robust than that of AS and alcohol use. Future studies should explore this issue. The results of the present study also revealed that lower order factors of the AS did

not significantly relate to the Social, Enhancement and Conformity drinking motives of alcohol dependent patients. Further research is needed to explore whether the AS-drinking motives association expands to motives other than Coping and which AS factors are particularly important in the drinking motives of alcohol dependent patients.

The present study showed that among the ASI-R lower order factors fear of cognitive dyscontrol is particularly important in the drinking behavior and drinking motives of university students. This factor is more highly correlated with drinking behavior scores than were corresponding correlations between the other ASI-R factors. Previous research has also found such a trend (i.e., Lawyer et al., 2002). In addition to the fear of cognitive dyscontrol factor, fear of publicly observable anxiety symptoms appeared important in the drinking motives of university students.

#### **4. 5. Limitations of the Present Study**

For both university student sample and alcohol dependent sample, all data were based on self-reported measures, and therefore relationships between variables might be strengthened. Thus, results of the present study could be due to only method variance.

For the university student sample, all data were collected during class hours and this might have restricted the validity of findings. Furthermore, since the battery was administered to students during class hours, the sample represented students who were attending classes. This may have excluded students having drinking problems or using high amounts of alcohol who may not even attend classes.

The university students of the present study represented nonclinical individuals. Thus, they should have been asked whether they were in treatment for any psychological disorder, if so they should have been excluded from the study.

To examine the association between AS and alcohol use among nonclinical samples, individuals from bars, night clubs etc. rather than university students might have been sampled. Among these individuals, whose drinking level and frequency might be higher as compared to students, AS-alcohol use association might be more prominent.

One of the important shortcomings of the current study regarding the alcohol dependent patient sample was including a low number of alcohol dependent patients. This situation inevitably reduces the validity of the generalization that one can make about the AS profiles of alcohol dependent patients, and hence the relationship among AS, alcohol use and drinking motives in these individuals. Therefore, the results of the current study regarding alcohol dependent sample should be interpreted with some caution.

Another limitation regarding the alcohol dependent patient sample was that a much lower number of female [3 (5.5%)] as compared to male [52 (94.5%)] alcohol dependent patients participated to the present study. Hence, alcohol dependent sample, predominantly consisted of male individuals, was not a representative sample with regards to gender. The present study should have rather included a mixed-gender sample of alcohol-dependent patients, which has comparable number of individuals in both gender.

Another potential problem is related to alcohol dependent patients' medication. All of the patients were under medication when they were administered

the battery. The impact of medication (e.g., anti-anxiety medication) could reduce the (state) anxiety levels of patients. As a result, this might have affected their ratings of their feelings of anxiety and / or fear of anxiety symptoms (AS) on various items of the battery. It has been found that elevated AS scores decreased when patients were treated with antidepressants (Otto et al., 1995). Hence, in the present study, alcohol dependent patients' AS levels might have been restricted due to medication, which might underestimate the association between AS and alcohol use in these individuals. In sum, medication treatment among alcohol dependent patients might have altered the results of the present study. It could have been better to study the first time alcohol dependent patients who were not under medication. However, as this condition was rare, the patients under medication were conveniently included to the study.

Lastly, for the alcohol dependent patient sample, comorbidity might be another important issue. It has been well documented that alcohol dependence comorbid to nearly all of the anxiety disorders (Himle & Hill, 1991; Kushner, Sher, & Beitman, 1990). People with alcohol dependence may also display psychological problems such as depression and abuse of other drugs (Avis, 1999). High correlations among ASI-R, STAI-T and BDI in the alcohol dependent inpatient sample ( *rs* ranging from 0.44 to 0.67) might be taken as indicators of comorbidity among these individuals. Although all the patients in the present study have been diagnosed as having alcohol dependence according to the DSM-IV diagnostic criteria (APA, 1994) by the expert psychiatrists at the hospitals, the researcher should have investigated prior to the administration of the battery whether the patients have a comorbid disorder or not. It may be that individuals with a co-morbid mental

disorder (e.g., anxiety disorder) represent a different group than individuals who are only alcohol dependent. Therefore, comorbid disorders, if they existed, might have affected the scores on self-reported measures.

#### **4. 6. Clinical Implications**

The present study identified self-reported drinking motives of university students and alcohol dependent patients. Determining drinking motives of university students is important, since drinking motives contribute to alcohol use and problems in university students (i.e., Read et al., 2003; Carey & Correia, 1997; Stewart & Zeitlin, 1995). By identifying drinking motives of university students and alcohol dependent patients, their drinking pattern, situations in which they drink and quantity of their drinking can be determined. Understanding what has brought one person to drink heavily will facilitate development of interventions that target to reduce alcohol consumption.

Present results showed that high AS students more likely to use alcohol for Coping Motives than those with moderate and low AS levels. It has been well documented that Coping Motive is associated with heavier alcohol use and alcohol related problems (Cooper, 1994). Thus, identifying high AS university student drinkers and helping them to develop alternative behaviors to drinking in negatively reinforcing situations might be a useful early prevention of alcohol-related problems among these individuals. Moreover, since Coping Motives are related to alcohol problems independent of alcohol use (Cooper et al., 1988), identifying individuals who reported drinking to cope, as independent of how much or frequent they drink, seems to be crucial.

If by future studies AS will be demonstrated a robust risk factor for alcohol use disorders, interventions designed to decrease AS could be an important supplement to alcohol abuse / dependence treatment. Likewise, interventions which teach high AS nonclinical individuals (e.g., university students) adaptive coping skills might prevent the development of harmful drinking. Such treatments could help to decrease the probability of someone with high AS to use alcohol to cope with his / her fear of anxiety symptoms and thus prevent the development of alcohol use disorders.

#### **4. 7. Directions for Future Research**

In the present study it has been found that in the university student sample, the correlation between ASI-R factors of fear of respiratory symptoms and fear of cardiovascular symptoms is high ( $\alpha = 0.73$ ). This suggests that there might be redundant items in the ASI-R. Thus, the factor structure of the ASI-R should be examined in future studies using nonclinical and clinical samples.

The results of the present study in general did not support the relationship between AS and alcohol use in university students and alcohol dependent patients. Additional studies are needed to clarify the nature of this relationship. Future research should examine the relationship between the components of AS measured by the ASI-R and alcohol use. Moreover, only few studies have examined AS levels in individuals with alcohol-related problems. Thus, more and more studies should investigate the relationship between AS and alcohol use in individuals with larger samples of patients with clinical levels of alcohol abuse / dependence.

Stewart et al. (1999) noted that the issue of whether high levels of AS contributes to alcohol use or whether alcohol use contributes to high levels of AS has not yet been determined. Therefore, further research is needed to resolve this issue. Longitudinal research observing people with elevated AS and non-elevated AS for a long period of time might resolve this issue.

Another issue future research should examine is the relationship between AS and alcohol use in individuals with panic disorder. Panic disorder has already shown to be related with high levels of AS, but future research can examine whether the AS levels of panic-disordered individuals who frequently drink and those who do not drink differ. It might be also interesting to study associations between AS, alcohol use and drinking motives in patients with comorbid anxiety disorders and alcohol use disorders, since AS may be a more prominent trait for these patients.

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## **APPENDICES**

## APPENDIX A

### ANXIETY SENSITIVITY INDEX - REVISED (ASI-R)

#### YÖNERGE:

Aşağıdaki her bir madde için, ifadelerin sağ tarafında yer alan ve o maddeyle ne derece hemfikir olduğunuzu gösteren seçeneklerden sizin için uygun olanını işaretleyerek belirtiniz. İfadelerden herhangi biri ile ilgili hiçbir deneyiminiz (örneğin, daha önce hiç ürpermeyen ya da titrediğini hissetmeyen bir kişi için “Titrediğimi hissetmek beni korkutur” maddesi gibi) ya da fikriniz yok ise, böyle bir yaşantınız olmuş olsaydı nasıl hissedeceğinizi düşünerek cevap veriniz. Diğer maddeleri kendi deneyimlerinizi /yaşantılarınızı temel alarak yanıtlayınız. Her madde için sadece bir seçeneği işaretleyiniz ve lütfen tüm maddelere cevap veriniz.

	Çok az	Az	Biraz	Oldukça	Çok fazla
1- Kaygılı/endişeli görünmemek benim için önemlidir					
2- Bir şeye (örn., iş, konu) kendimi veremediğim zaman, aklımı kaçıyorum diye endişelenirim.					
3- Ürperdiğimi (titrediğimi) hissetmek beni korkutur.					
4- Bayılacağımı hissetmek beni korkutur.					
5- Kalbimin çok hızlı atması beni korkutur.					
6- Midemin bulanması beni korkutur.					
7- Kalbimin çok hızlı çarptığını fark ettiğimde, kalp krizi geçirebilirim diye endişelenirim.					
8- Nefesimin daralması beni korkutur.					
9- Midem rahatsız olduğunda, ciddi bir hastalığım olabilir diye endişelenirim.					
10- Kendimi bir işe/konuya verememek beni korkutur.					
11- Başım uğuldadığında, felç geçirebilirim diye endişelenirim.					
12- Başkalarının yanında titrediğimde, insanlar benim hakkımda ne düşünecek diye korkarım.					

	Çok az	Az	Biraz	Oldukça	Çok fazla
13- Yeterince nefes alamadığımı hissettiğimde, boğulabilirim diye korkarım.					
14- İshal olduğumda, bir rahatsızlığım var diye endişelenirim.					
15- Göğsüm sıkıştığı zaman, düzgün nefes alamayacağımı korkarım.					
16- Nefes alıp vermem düzensizleştiğinde, kötü bir şey olacağından korkarım.					
17- Etrafımın garip veya gerçek dışı görünmesi beni korkutur.					
18- Boğulacakmış gibi olmak beni korkutur.					
19- Göğsümde ağrı hissettiğimde, kalp krizi geçireceğim diye endişelenirim.					
20- Herkesin içinde kusmanın berbat bir şey olduğuna inanıyorum.					
21- Bedenimde herhangi bir tuhaflik veya değişiklik hissetmek beni korkutur.					
22- Başkalarının kaygılı olduğumu fark etmeleri beni endişelendirir.					
23- Gerçeklik duygumu kaybettiğimi veya “koptuğumu” hissettiğimde, akıl hastası olabilirim diye endişelenirim.					
24- Başkalarının yanında yüzümün kızarması beni korkutur.					
25- Midemde şiddetli bir ağrı hissettiğimde, kanser olabilir diye endişelenirim.					
26- Yutmakta zorlandığımda, boğulabilirim diye endişelenirim.					

	Çok az	Az	Biraz	Oldukça	Çok fazla
27- Kalbimin teklediğinin farkına vardığımda, ciddi bir rahatsızlığım var diye endişelenirim.					
28- Ellerimin uyuşması veya karıncalanması beni korkutur.					
29- Başım döndüğünde, bir rahatsızlığım var diye endişelenirim.					
30- Sosyal bir ortamda terlemeye başladığım zaman, insanların benim hakkımda olumsuz düşüneceğinden korkarım.					
31- Kafamda düşünceler uçmaya başladığında, aklımı kaçıyorum diye endişelenirim.					
32- Boğazım düğümlendiğinde, boğulup öleceğim diye endişelenirim.					
33- Yüzüm uyuştığında, felç geçiriyor olabilirim diye endişelenirim.					
34- Net bir şekilde düşünemediğimde, bir rahatsızlığım var diye endişelenirim.					
35-Herkesin içinde bayılmanın benim için korkunç birşey olacağına inanıyorum					
36- Zihnimi bomboş hissettiğimde, oldukça kötü bir rahatsızlığım var diye endişelenirim.					

## APPENDIX B

### STATE-TRAIT ANXIETY INVENTORY-TRAIT FORM (STAI-T)

#### YÖNERGE

Aşağıda kişilerin kendilerine ait duygularını anlatmada kullandıkları bir takım ifadeler verilmiştir. Her ifadeyi okuyun, sonra da genel olarak nasıl hissettiğinizi, ifadelerin sağ tarafındaki seçeneklerden size uygun olanını işaretleyerek belirtiniz. Doğru ya da yanlış cevap yoktur. Herhangi bir ifadenin üzerinde fazla zaman sarfetmeksizin genel olarak nasıl hissettiğinizi gösteren cevabı işaretleyiniz.

	Hemen hemen hiçbir zaman	Bazen	Çoğu zaman	Hemen hemen her zaman
1. Genellikle keyfim yerindedir				
2. Genellikle çabuk yorulurum.				
3. Genellikle kolay ağlarım.				
4. Başkaları kadar mutlu olmak isterim.				
5. Çabuk karar veremediğim için fırsatlar kaçıyorum.				
6. Kendimi dinlenmiş hissederim.				
7. Genellikle sakin, kendime hakim ve soğukkanlıyım.				
8. Güçlüklerin yenemeyeceğim kadar biriktiğini hissederim.				
9. Önemsiz şeyler hakkında endişelenirim.				
10. Genellikle mutluyum.				
11. Herşeyi ciddiye alır ve etkilenirim.				
12. Genellikle kendime güvenim yoktur.				
13. Genellikle kendimi emniyette hissederim.				
14. Sıkıntılı ve güç durumlarla karşılaşmaktan kaçınırım.				
15. Genellikle kendimi hüzünlü hissederim.				
16. Genellikle hayatımdan memnunum.				

	Hemen hemen hiçbir zaman	Bazen	Çoğu zaman	Hemen hemen her zaman
17. Olur olmaz düşünceler beni rahatsız eder.				
18. Hayal kırıklıklarını öylesine ciddiye alırım ki hiç unutamam.				
19. Akli başında ve kararlı bir insanım.				
20. Son zamanlarda kafama takılan konular beni tedirgin eder.				

## APPENDIX C

### BECK DEPRESSION INVENTORY (BDI)

#### YÖNERGE

Aşağıda, kişilerin ruh durumlarını ifade ederken kullandıkları bazı cümleler verilmiştir. Her madde, bir çeşit ruh durumunu anlatmaktadır. Her madde için o ruh durumunun derecesini belirleyen 4 seçenek vardır. Lütfen bu seçenekleri dikkatle okuyunuz. Son bir hafta içindeki (şu an dahil) kendi ruh durumunuzu göz önünde bulundurarak, size en uygun olan ifadeyi bulunuz. Daha sonra, o maddenin yanındaki harfin üzerine (x) işareti koyunuz.

1. (a) Kendimi üzgün hissetmiyorum.  
(b) Kendimi üzgün hissediyorum.  
(c) Her zaman için üzgünüm ve kendimi bu duygudan kurtaramıyorum.  
(d) Öylesine üzgün ve mutsuzum ki dayanamıyorum.
2. (a) Gelecekte umutsuz değilim.  
(b) Geleceğe biraz umutsuz bakıyorum.  
(c) Gelecekte beklediğim hiçbir şey yok.  
(d) Benim için bir gelecek yok ve bu durum düzelmeyecek.
3. (a) Kendimi başarısız görmüyorum.  
(b) Çevremdeki bir çok kişiden daha fazla başarısızlıklarım oldu sayılır.  
(c) Geriye dönüp baktığımda, çok fazla başarısızlığımın olduğunu görüyorum.  
(d) Kendimi tümüyle başarısız bir insan olarak görüyorum.
4. (a) Herşeyden eskisi kadar zevk alabiliyorum.  
(b) Herşeyden eskisi kadar zevk alamıyorum.  
(c) Artık hiçbir şeyden gerçek bir zevk alamıyorum.  
(d) Bana zevk veren hiçbirşey yok. Herşey çok sıkıcı.
5. (a) Kendimi suçlu hissetmiyorum.  
(b) Arada bir kendimi suçlu hissettiğim oluyor.  
(c) Kendimi çoğunlukla suçlu hissediyorum.  
(d) Kendimi her an için suçlu hissediyorum.
6. (a) Cezalandırıldığımı düşünmüyorum.  
(b) Bazı şeyler için cezalandırılabileceğimi hissediyorum.  
(c) Cezalandırılmayı bekliyorum.  
(d) Cezalandırıldığımı hissediyorum.
7. (a) Kendimden hoşnutum.  
(b) Kendimden pek hoşnut değilim.  
(c) Kendimden hiç hoşlanmıyorum.  
(d) Kendimden nefret ediyorum.
8. (a) Kendimi diğer insanlardan daha kötü görmüyorum.  
(b) Kendimi zayıflıklarım ve hatalarım için eleştiriyorum.  
(c) Kendimi hatalarım için çoğu zaman suçluyorum.  
(d) Her kötü olayda kendimi suçluyorum.

9. (a) Kendimi öldürmek gibi düşüncelerim yok.  
(b) Bazen kendimi öldürmeyi düşünüyorum, fakat bunu yapmam.  
(c) Kendimi öldürebilmeyi isterdim.  
(d) Bir fırsatını bulsam kendimi öldürürdüm.
- 10.(a) Her zamankinden daha fazla ağladığımı sanmıyorum.  
(b) Eskisine göre şu sıralarda daha fazla ağlıyorum.  
(c) Şu sıralarda her an ağlıyorum.  
(d) Eskiden ağlayabilirdim, ama şu sıralarda istesem de ağlayamıyorum.
- 11.(a) Her zamankinden daha sinirli değilim.  
(b) Her zamankinden daha kolayca sinirleniyor ve kızıyorum.  
(c) Çoğu zaman sinirliyim.  
(d) Eskiden sinirlendiğim şeylere bile artık sinirlenemiyorum.
- 12.(a) Diğer insanlara karşı ilgimi kaybetmedim.  
(b) Eskisine göre insanlarla daha az ilgiliyim.  
(c) Diğer insanlara karşı ilgimin çoğunu kaybettim.  
(d) Diğer insanlara karşı hiç ilgim kalmadı.
- 13.(a) Kararlarımı eskisi kadar rahat ve kolay verebiliyorum.  
(b) Şu sıralarda kararlarımı vermeyi erteliyorum.  
(c) Kararlarımı vermekte oldukça güçlük çekiyorum.  
(d) Artık hiç karar veremiyorum.
- 14.(a) Dış görünüşümün eskisinden daha kötü olduğunu sanmıyorum.  
(b) Yaşlandığımı ve çekiciliğimi kaybettiğimi düşünüyorum ve üzülüyorum.  
(c) Dış görünüşümde artık değiştirilmesi mümkün olmayan olumsuz değişiklikler olduğunu hissediyorum.  
(d) Çok çirkin olduğumu düşünüyorum.
- 15.(a) Eskisi kadar iyi çalışabiliyorum.  
(b) Bir işe başlayabilmek için eskisine göre kendimi daha fazla zorlamam gerekiyor.  
(c) Hangi iş olursa olsun, yapabilmek için kendimi çok zorluyorum.  
(d) Hiçbir iş yapamıyorum.
- 16.(a) Eskisi kadar rahat uyuyabiliyorum.  
(b) Şu sıralarda eskisi kadar rahat uyuyamıyorum.  
(c) Eskisine göre 1 veya 2 saat erken uyanıyor ve tekrar uyumakta zorluk çekiyorum.  
(d) Eskisine göre çok erken uyanıyor ve tekrar uyuyamıyorum.
- 17.(a) Eskisine kıyasla daha çabuk yorulduğumu sanmıyorum.  
(b) Eskisinden daha çabuk yoruluyorum.  
(c) Şu sıralarda neredeyse herşey beni yoruyor.  
(d) Öyle yorgunum ki hiçbirşey yapamıyorum.
- 18.(a) İştahım eskisinden pek farklı değil.  
(b) İştahım eskisi kadar iyi değil.  
(c) Şu sıralarda iştahım epey kötü.  
(d) Artık hiç iştahım yok.

- 19.(a) Son zamanlarda pek fazla kilo kaybettiğimi sanmıyorum.  
(b) Son zamanlarda istemediğim halde üç kilodan fazla kaybettim.  
(c) Son zamanlarda istemediğim halde beş kilodan fazla kaybettim.  
(d) Son zamanlarda istemediğim halde yedi kilodan fazla kaybettim.

Daha az yemeye çalışarak kilo kaybetmeye çalışıyorum. Evet ( ) Hayır ( )

- 20.(a) Sağlığım beni pek endişelendirmiyor.  
(b) Son zamanlarda ağrı, sızı, mide bozukluğu, kabızlık gibi sorunlarım var.  
(c) Ağrı, sızı gibi bu sıkıntılarım beni epey endişelendirdiği için başka şeyleri düşünmek zor geliyor.  
(d) Bu tür sıkıntılar beni öylesine endişelendiriyor ki, artık başka hiçbir şey düşünemiyorum.
- 21.(a) Son zamanlarda cinsel yaşantımda dikkatimi çeken bir şey yok.  
(b) Eskisine oranla cinsel konularla daha az ilgileniyorum.  
(c) Şu sıralarda cinsellikle pek ilgili değilim.  
(d) Artık, cinsellikle hiçbir ilgim kalmadı.

## APPENDIX D

### ALCOHOL USE DISORDERS IDENTIFICATION TEST (AUDIT)

1. Ne kadar sıklıkla alkol kullanırsınız?
  - a) hiçbir zaman
  - b) ayda bir ya da daha az
  - c) ayda iki ya da dört kez
  - d) haftada iki ya da üç kez
  - e) haftada dört ya da daha fazla
2. Alkol almaya (içki içmeye) başladığınızda genellikle kaç tane (kadeh ya da şişe) içersiniz?
  - a) 1 ya da 2
  - b) 3 ya da 4
  - c) 5 ya da 6
  - d) 7 ya da 9
  - e) 10 ya da daha fazla
3. Ne kadar sıklıkta bir kerede 6 ya da daha fazla alkol alırsınız?
  - a) hiçbir zaman
  - b) ayda birden daha az
  - c) ayda bir
  - d) haftada bir
  - e) her gün ya da hemen hemen her gün
4. Geçen yıl içinde alkol almaya başladıktan sonra kendinizi durduramadığınız (içmekten alıkoyamadığınız) bir durum ne kadar sıklıkta oldu?
  - a) hiçbir zaman
  - b) ayda birden daha az
  - c) ayda bir
  - d) haftada bir
  - e) her gün ya da hemen hemen her gün
5. Geçen yıl içinde ne kadar sıklıkta normal olarak sizden beklenmeyen ancak alkollü olduğunuz için yaptığınız davranışlar oldu?
  - a) hiçbir zaman
  - b) ayda birden daha az
  - c) ayda bir
  - d) haftada bir
  - e) her gün ya da hemen hemen her gün

6. Geçen yıl içinde ne kadar sıklıkta, çok alkol aldığımız bir gecenin sabahında, uyandığımızda tekrar hemen bir kadeh alkol almak istediniz?

- a) hiçbir zaman
- b) ayda birden daha az
- c) ayda bir
- d) haftada bir
- e) her gün ya da hemen hemen hergün

7. Geçen yıl içinde ne kadar sıklıkta, alkol aldıktan sonra kendinizi suçlu hissettiniz ya da pişmanlık duydunuz?

- a) hiçbir zaman
- b) ayda birden daha az
- c) ayda bir
- d) haftada bir
- d) her gün ya da hemen hemen hergün

8. Geçen yıl içinde ne kadar sıklıkta, alkolden dolayı bir gece önce yaptıklarınızı hatırlamadığınız oldu?

- a) hiçbir zaman
- b) ayda birden daha az
- c) ayda bir
- d) haftada bir
- e) her gün ya da hemen hemen hergün

9. Alkollüyken herhangi bir kişiyi yaraladığınız oldu mu?

- a) hiçbir zaman
- b) evet, fakat geçen yıl değil
- c) evet, geçen yıl içinde

10. Bir arkadaşınız ya da yakınınız ne kadar sıklıkta sizin alkol kullanma davranışınızdan dolayı kaygılanıp, alkölü bırakmanız gerektiğini söylüyor?

- a) hiçbir zaman
- b) evet fakat geçen yıl değil
- c) evet, geçen yıl içinde

## APPENDIX E

### DRINKING MOTIVES QUESTIONNAIRE-REVISED (DMQ-R)

#### YÖNERGE

Aşağıda insanların alkol kullanmak için verdikleri nedenlerin bir listesi vardır. Eğer alkol kullanıyorsanız, onları okumanızı ve herbiri için size uygun olan seçeneği işaretlemenizi istiyoruz. Cümlelere doğru ya da yanlış yanıt yoktur. Tüm bilmek istediğimiz genel olarak hangi nedenlerden dolayı alkol kullandığınızdır.

Alkol kullandığınız tüm zamanları şöyle bir düşünürseniz, hangi sıklıkta aşağıdaki nedenlerden dolayı alkol kullanıyorsunuz?

	Hiçbir zaman	Nadiren	Bazen	Çoğunlukla	Her zaman
1-Verdiği duygudan hoşlandığınız için					
2- Heyecan verdiği için					
3- Kafayı bulmak için					
4- Size hoş bir duygu verdiği için					
5- Eğlenceli olduğu için					
6- Dertlerinizi unutmak için					
7- Depresif ya da gergin hissettiğinizde sizi rahatlattığı için					
8- Moraliniz bozuk olduğunda moralinizi düzeltmek için					
9- Kendinize olan güveninizin artmasını ya da kendinizden daha fazla emin olmanızı sağladığı için					
10- Sorunlarınızı unutmak için					
11- Arkadaşlarınız içmeniz için baskı yaptığı için					
12- Başkaları içmediğiniz için sizinle dalga geçmesin diye					

	Hiçbir zaman	Nadiren	Bazen	Çoğunlukla	Her zaman
13- Birlikte olmaktan hoşlandığınız bir gruba uyum göstermek için					
14- Başkaları sizden hoşlansınlar diye					
15- Kendinizi dışlanmış hissetmemek için					
16- Bir eğlenceden /partiden /toplantıdan keyif almanıza yardım ettiği için					
17- İnsanlarla yakın olmak için					
18- Sosyal birliktelikleri (ortamları) daha eğlenceli kıldığı için					
19- Parti ve kutlamaları daha zevkli/eğlenceli yaptığı için					
20- Arkadaşlarla özel bir olayı kutlamak için					