DRUG AND ALCOHOL MISUSE, DEPRESSIVE AND ANXIOUS SYMPTOMS, AND SELF-MANAGEMENT

ROSS D. CONNOLLY

DRUG AND ALCOHOL MISUSE, DEPRESSIVE AND ANXIOUS SYMPTOMS, AND SELF-MANAGEMENT

by

© Ross D Connolly

A thesis submitted to the

School of Graduate Studies

in partial fulfillment of the requirements for the degree of

Master of Science

Psychology/Science

Memorial University of Newfoundland

October, 2013

St. John's Newfoundland

Abstract

Drawing on the well-established effectiveness of self-management approaches to anxiety and depression and other psychological symptoms, and the recognized comorbidity between these disorders and substance use, the purpose of the current study was to consider if symptoms of substance misuse and of anxiety and depression are related to each other in the context of a self-management framework. Self-management skills, depressive and anxious symptoms, as well as level of substance misuse were assessed in a community sample consisting of 53 adults, aged 19 and up. Self-management moderated the relationship between depression and alcohol misuse. Self-management was also shown to moderate the relationships between alcohol misuse and depression, anxiety, and stress. High levels of self-management acted as a protective factor, which reduced the strength of these relationships.

Acknowledgements

I would like to thank Dr. Peter Mezo for the guidance he has provided me throughout my Master's degree. Thank you for your encouragement and showing me my potential as a researcher. I would also like to thank my committee members, Dr. Sarah Francis and Dr. Greg Radu, for their insight and advice.

I would like to thank both past and current members of the MIRIAM lab who have contributed to this study. I would especially like to express my gratitude to Dr. Valerie Noel and Ms. Kerri Bojman. Without their support this thesis would not have been possible.

Thank you to the staff of the John Howard Society of Newfoundland and the Salvation Army Wiseman Centre for your assistance in facilitating this research.

A special thank-you to Brenda Crewe for keeping me on top of things.

Last, but not least, I would like to thank my friends and family for all of their support. Thank you all so much for your encouragement throughout the last two years.

Table of Contents

List of Tables

List of Figures

List of Abbreviations

SCMS	Self-Control Self-Management Scale
DASS-21	The Depression Anxiety Stress Scale
MAST	Michigan Alcoholism Screening Test
DAST-20	Drug Abuse Screening Test

List of Appendices

Drug and alcohol use, symptoms, and ways of coping.

The goal of the current research was to consider if symptoms of substance misuse are related to a self-management framework and to investigate the relevance of self-management in understanding these symptoms. This is an important question given the well-established effectiveness of self-management approaches to anxiety and depression and psychological symptoms (Dobson & Dozois, 2001), and the recognized comorbidity between these disorders and substance misuse (Bruce, Yonkers, Otto, Eisen, Weisberg, Pagano, & Keller, 2005). Thus, by considering the variables of substance misuse and self-management together, it may be possible to advance our understanding of these constructs, and hence aid in the development of adaptive and appropriate coping strategies for individuals who otherwise rely on alcohol and drugs to self-medicate their symptoms.

Substance Misuse

Substance and alcohol misuse have been associated with a variety of undesirable behaviours and negative consequences, which include not only effects to one's own body and cognitive abilities, but also negative social effects (McKee, 2001). Although substance use can induce sensations of euphoria and well-being, these sensations are generally outweighed by negative consequences. Such problems include accidents leading to physical harm of self and others, impaired social relationships, and engaging in law-breaking behaviours and incurring subsequent difficulties with the law (Asbridge, Poulin, & Donato, 2005). Specific drugs may also have other detrimental effect on one's physical well-being, including sleep disturbances and irregular sleeping patterns (Ogeil,

2011), acute memory problems, psychomotor impairment, and bronchial or pulmonary illnesses (Fischer, Dawe, Mcguire, Shuper, Jones, Rudzinski, & Rehm, 2012).

There have been various models developed to account for why people fall into a cycle of disordered substance use. One such early model of addiction was the moral model (Hyman, 2007; Morse, 2004). The moral model viewed dependence as a choice made by individuals with "low moral standards". People who became substance abusers were characterized as inherently bad individuals who do bad things that are driven by their lack of values (Hyman, 2007; Morse, 2004). In contrast, the disease model argues that users cannot be held accountable for their dependences; people who are substance abusers are viewed as individuals inflicted with a terrible disease, of which drug dependence is the primary symptom. The learning model of addiction, however, emerged from an assumption that behaviour is determined or learned from environmental factors (Davies, 1998). Currently, researchers subscribe to disease and learning models of addiction, and this study will emphasize the learning model given the focus on learning in a self-management context.

The learning model explains dependence as a conditioned response to the environment, and therefore explains dependence as a learned behaviour (Heyman, 2009). Symptoms of substance dependence have been understood in terms of rewarding a regularly occurring behaviour that allows users to experience pleasure or temporarily escape from an undesirable or painful reality. However, a physiological dependence on the drug grows across repeated administrations as one attempts to relieve emotional, psychological, or physical suffering (Palfai, 2004).

The learning model views drug and alcohol dependence as a habit rather than as an illness, meaning that the treatment for drug dependence may be focused on changing habitual learning pathways that are initiated by the person. In this view, people are responsible for their own health and well-being (De Ridder & De Wit, 2006), which is the overarching benefit of the model, in that the individual is capable of exercising self-control over his or her own health and as such is able to moderate and control substance use through self-management strategies.

The majority of research addressing relations among psychopathological processes, drug use, and drug dependence, has focused primarily on psychotic disorders, antisocial personality disorder, and attention deficit hyperactivity disorder (Zvolensky, Buckner, Norton, & Smits, 2011). Another area of research has examined substance misuse and depression (Weiss, Griffin, & Mirin, 1992) and relative to that, less research has been done in terms of the relationship between anxiety and substance misuse.

Self-Management

Self-management treatment, which is a form of cognitive-behavioural therapy (CBT), has been used in the treatment of anxiety and depression, and has also been found to be helpful in alcohol and drug dependence (Febbraro & Clum, 1998). However, no research to date has comprehensively studied the current self-management model with substance use symptoms. Through the treatment of individuals' depressive and anxiety symptoms, the goal of self-management CBT is to help individuals replace maladaptive coping skills, cognitions, emotions, and behaviours with more adaptive ones. The individual is taught to recognize situations that elicit anxious or depressive symptoms, to avoid these circumstances, and to cope with situations that could cause

them to experience anxiety or depression that could potentially lead to self-medication through substance use (Hepner, Hunter, Paddock, Zhou, & Watkins, 2011).

Self-management skills were originally conceptualized by Kanfer and Karoly (1972). Later, Bandura (1991) independently developed a similar model. Self-management may be defined as a high-level executive control process, whereby individuals regulate their own behaviour through a process of negative feedback (Carver & Scheier, 1996). Carver and Scheier (1996) have suggested that an innate control system is responsible for self-regulation. According to their model of self-management, human behaviour is a constant process of approaching and avoiding cognitive goal representations. One characteristic that is shared by these models of self- management is that behaviour is regulated by a process of negative feedback, involving three independent processes: self-monitoring, self-evaluation, and self-reinforcement. These three processes operate in a closed feedback loop such that the output of one serves as the input for another.

Firstly, the self-monitoring process can be thought of as attention to performance (Mezo, 2009). During this phase an individual monitors his/her behaviours, the conditions under which the behaviours occur, and the immediate proximal effects of one's performance. More specifically, individuals attend to specific behaviours, cognitions, or emotions in order to determine the current state of their performance, and to make note of patterns of co-variation in order to identify salient features of their environment. Self-monitoring has been associated with personal-experimentation, where an individual varies aspects of their daily life to observe the outcomes in order to determine what influences their psychosocial functioning (Neuringer, 1981). Self-

monitoring of one's current performance provides a benchmark against which to measure future performance and makes setting goals for progressive improvement possible. Individuals who inconsistently monitor their actions are likely to suffer deficits in self-regulation due to the breakdown of the self-monitoring process because information about current behaviour is the input for the self-evaluation phase (Mezo, 2009).

Secondly, the information from the self-monitoring phase is carried forward to the self-evaluation phase, during which the current state of behaviour is compared to an internalized standard (Mezo, 2009). Individuals then compare the data to these internalized standards in order to determine if a discrepancy exists. Whether or not a discrepancy exists between the current state of behaviour and the internalized standard of performance is the input for the final phase, self-reinforcement (Mezo, 2009).

During the self-reinforcement phase, overt or covert punishment or reward is made contingent on the output of the self-evaluative comparison (Mezo, 2009). Hence, if self-satisfaction or tangible rewards are made contingent on performance then individuals are motivated to achieve the requisite level of success. Individuals pursue behaviours that produce positive self-reactions; thus, through the use of self-management skills cognitive representations of future events can be converted into present modulators of behaviour (Bandura, 1991). Self- management skills allow an individual to engage in objectively low-probability behaviours in the face of competing high-probability behaviours (Kanfer & Karoly, 1972). Simply put, it may be understood in terms of the processes that guide the setting and achievement of goals (Karoly, 1999).

Through self-management of health habits, people reduce major health risks and live healthier and more productive lives (Bandura 1991; Ridder & de Wit, 2006). Self-management is successful because it allows for one's purposive processing of information for selecting, formulating, regulating, and evaluating goals, as well as providing a course of action to reach those goals (Bandura, 2001). Self-regulatory techniques give people direction, and also create incentive, which enable them to sustain their efforts to reach goals. They do things that give them self-satisfaction, a sense of pride, and self-worth. In doing so, they refrain from behaving in ways that give rise to self-dissatisfaction, self-devaluation, and self-censure (Bandura, 2001). These self-regulatory techniques have been examined as primary interventions with adult problem behaviours (Febbraro & Clum, 1998). Studies have targeted such problem behaviours as smoking (Foxx & Axelroth, 1983) and depressive symptomatology (Harmon, Nelson, & Hayes, 1980) with promising results.

Self-Medication and Anxious and Depressive Symptoms

Given the value of self-management, particularly with anxiety and depression, it is important to consider how substance use disorders are comorbid with anxiety and depression. The self-medication of depressive and anxious symptoms with alcohol, other drugs, or both, is a plausible mechanism for the co-occurrence of anxiety disorders and substance use disorders (Robinson, Sareen, Cox, & Bolton, 2011). The self-medication hypothesis of addictive disorders suggests that individuals with substance addictions attempt to medicate themselves for a range of psychiatric problems and painful emotional states (Lagoni, Crawford, & Huss, 2011). For example, an individual might use cocaine

to battle depression because of its effect on happiness, power, and its energizing properties (Harris & Edlund, 2005).

Similarly, alcohol is widely abused among those with depressive symptoms. Studies suggest that persons with depressive disorders and poor self-management have a two-fold increased risk of developing alcohol use disorders (Boschloo, Vogelzangs, Smit, Van Den Brink, Veltman, Beekman, & Penninx, 2011). Studies have also shown that individuals will self-administer sedative hypnotics with alcohol as a means of alleviating anxious symptoms (Mirin, Weiss, Griffin, & Michael, 1991). Substance users discover that the short-term effects of their drugs of choice help them to cope with distressful subjective states that would otherwise be experienced as insurmountable or overwhelming (Lagoni, Crawford, & Huss, 2011). However, long-term alcohol use disorders have been shown to be associated with depressive and anxious disorders, and the use of illicit drugs has been shown to increase the strength of these associations (Suttajit, Kittirattanapaiboon, Junsirimongkol, Likhitsathian, & Srisurapanont, 2012).

Compared with the general population, individuals with alcohol use disorders have a significantly increased risk of developing major depressive and anxious disorders, and the risks are higher among individuals who misuse both alcohol and other substances (Suttajit et al., 2012; Tran & Smith, 2008). Depressants, such as alcohol and opiates, are used in an attempt to decrease anxiety, but during stages of withdrawal ones level of anxiety is exacerbated, leading to even greater levels of misuse (Schuckit & Hesselbrock, 1994). Essentially, anxiety disorders in some individuals could largely be an artifact of alcohol withdrawal. Furthermore, chronic alcohol abuse could contribute to the development of an anxiety disorder through desensitization (Kushner, Abrams, &

Borchardt, 2000). An individual who abuses alcohol inhibits the mechanism that prevents escalation from normal anxiety reactions, and therefore promotes higher levels of anxiety. In a situation such as experiencing job loss, relationship breakdown, or some other highly stressful event, one would be less likely to manage the level of stress they experience, and therefore more likely to increase alcohol consumption as a means of coping (Kushner et al., 2000).

Self-management interventions have been efficacious with depression, anxiety, and habit disturbances, including excessive alcohol consumption and excessive tobacco smoking (Febbraro & Clum, 1998). Febrarro and Clum (1998) discussed the potential use of self-management with substance use; however, research in its extant form has not sufficiently explored the comorbidity of anxious and depressive disorders in conjunction with alcohol and substance use within this framework (Dobson, 2010).

Healthcare Implications

Symptoms of mental health disorders should alert healthcare providers to the possibility of substance use disorder comorbidity and the need for early intervention. Since drug abuse and dependence are a severely impairing condition (Bruce et al, 2005), identification of these problems through screening may greatly enhance patient health care. In any case, given the effectiveness of self-management in anxious and depressive symptoms, it is worthwhile to investigate the impact of self-management on the relationship between mood disorders and substance misuse.

Present Research

The present study aims to investigate self-management as it relates to the comorbidity of substance use and anxiety and depressive symptoms in a sample of

distressed individuals. Self-management has been shown to been related to depression, anxiety, and stress (Mezo, 2009; Mezo & Short, 2012), and these facets of distress have been shown to be related to substance misuse through self-medication (Lagoni, Crawford, & Huss, 2011; Boschloo et al., 2011; Harris & Edlund, 2005; Mirin, Weiss, Griffin, & Michael, 1991). Thus, a series of hypotheses are made regarding expected relationships. First, it is hypothesized that self-management will correlate significantly with global distress, as well as with alcohol and substance misuse. Secondly, it is predicted that self-management will correlate significantly with alcohol and substance misuse and with the three components of overall distress; anxiety, depression, and stress.

Research has shown that those with poor self-management skills are more prone to experiencing high levels of anxious and depressive symptoms (Febbraro & Clum, 1998). Furthermore, these symptoms have been linked to alcohol and substance misuse (Suttajit et al. 2012). Therefore, in addition to observing the hypothesized bivariate correlations, a moderational model is proposed. Namely, it is hypothesized that individuals with symptoms of anxiety and depression will have higher rates of alcohol and substance use, and that this relationship will be moderated by self-management (see Figure 1).

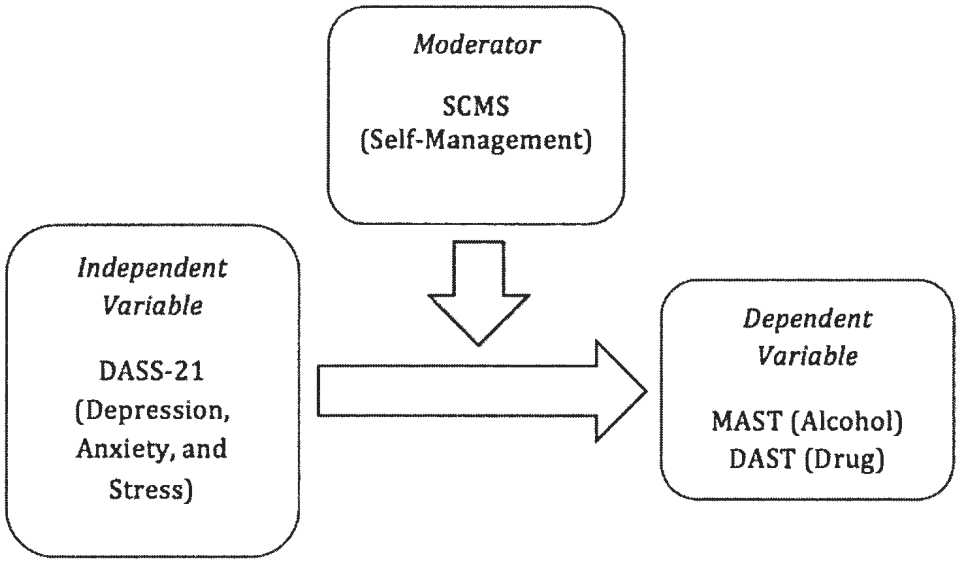

Figure 1. Hypothesis one: Proposed moderation of self-management between depressive and anxious symptoms, and alcohol and substance misuse.

Furthermore, it is hypothesized that individuals with high levels of alcohol and substance misuse will have higher levels of depressive and anxious symptoms, and that this relationship will also be moderated by self-management (see Figure 2).

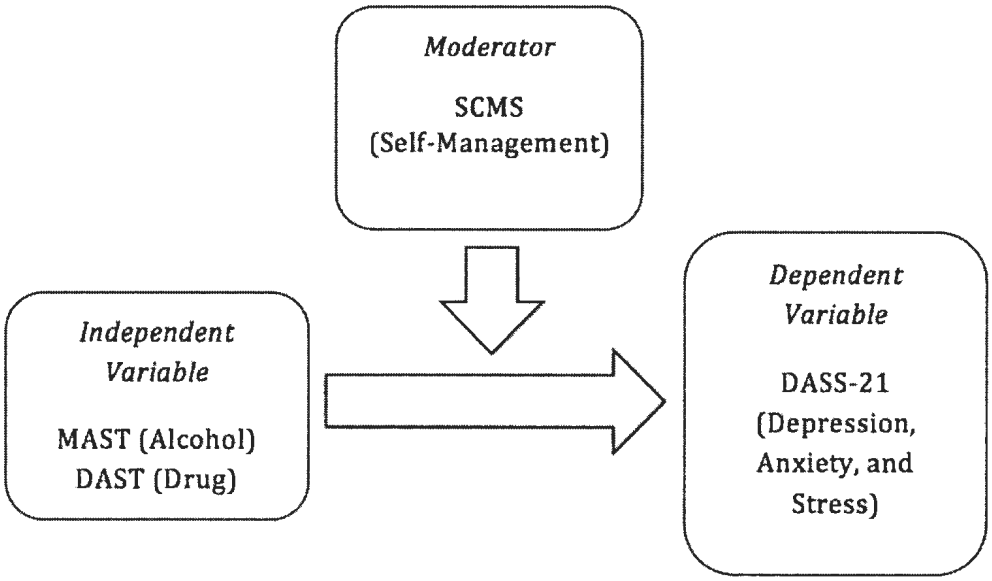

Figure 2. Hypothesis two: Proposed moderation of self-management between alcohol and substance misuse, and depressive and anxious symptoms.

Methods

Participants

Fifty-five participants agreed to take part in the study; however two questionnaire packets were incomplete or improperly filled out. The final sample consisted of 53 (44 male and 9 female) adult participants, drawn from two community groups in St. John's. The groups included The Salvation Army Wiseman Centre Men's Shelter, and the John Howard Society of Newfoundland and Labrador C-Step rehabilitation program. Participants ranged in age from 19 years to 66 years with a mean age of 38.79 years (*SD* = 12.64 years). The sample was 94.3% (n=40) Caucasian, and 5.7% (n=3) Native. Ten participants did not indicate their ethnic group. For educational level attainted, 26.4% (n=14) of participants reported grade 8 or less, 41.5% (n=22) reported completing high school, 5.7% (n=3) reported completing some equivalent education rather than high school, 11.3% (n=6) completed business, trade, or vocational school after high school, 3.8% (n=2) completed a bachelor's degree, and 1.9% (n=1) completed a post bachelor degree. The average reported annual income was between $8,301 and $10,400.

Measures

The study concurrently measured symptoms of anxiety and depression, level of substance abuse, and self-management among a vulnerable sample. Five questionnaires were used to measure these independent constructs.

Demographic Information Form. The demographic information sheet (see Appendix A) consisted of a series of questions regarding the participant's age, gender, ethnicity, marital status, number of children, current employment, and income (assessment of socioeconomic status). The demographic information sheet appeared at the front of every package following the consent form.

Self-Control and Self-Management Scales (SCMS; Mezo, 2009). As a measure of self-management, the Self-Control and Self-Management Scales was utilized (Mezo, 2009; see appendix B). The SCMS provides an overall indication of a person's level of Self-Control and Self-Management, and also provides separate scores for each of the three subscales: Self-Monitoring, Self-Evaluation, and Self-Reinforcing. The scale consists of 16 items rated on a 6-point Likert scale ranging from 0 (very undescriptive of me) to 5 (very descriptive of me). The three-factor structure of the SCMS has been empirically supported by a confirmatory factor analysis (Mezo & Short, 2012). The test-retest reliability of the SCMS and its subscales have been reported as 0.75, 0.66, 0.62, and 0.70 for the total SCMS, self-monitoring, self-evaluation, and self-reinforcement scales, respectively.

Depression Anxiety and Stress Scale (DASS-21; Antony, Bieling, Cox, Enns, & Swinson, 1998). The Depression Anxiety Stress Scale (DASS-21) was initially developed on an empirical basis from non-clinical populations as a 42-item self-report measure for anxiety and depression symptoms (Lovibond & Lovibond, 1995). However, a shorter 21-item instrument with improved psychometrics of the measure is used (Antony, Bieling, Cox, Enns, & Swinson, 1998; see appendix C). The essential function of the DASS-21 is to assess the severity of a range of symptoms of depression, anxiety

and stress. Items are rated on a 4-point likert scale ranging from 0-3. There are three individual scales, which measure Depression, Anxiety, and Stress separately.

Michigan Alcoholism Screening Test (MAST; Selzer, 1975; see Appendix D). The Michigan Alcoholism Screening Test is a brief self-report questionnaire designed to identify dependent drinkers and various problems associated with alcohol misuse. Questions on the MAST relate to self-appraisal of social, vocational, and family problems frequently associated with heavy drinking. The mast yielded a test-retest reliability score of 0.84 (Skinner & Sheu, 1982). The average alpha for the full-length MAST is 0.87 with a range from 0.83 to 0.93 (Gibbs, 1983).

Drug Abuse Screening Test (DAST-20; Skinner, 1982; see Appendix E). The Drug Abuse Screening Test is a 20-item instrument developed for clinical screening and treatment evaluation research in the substance dependence field (Moller & Linaker, 2010). The items comprising the DAST-20 are modifications of the items comprising the Michigan Alcoholism Screening Test (MAST) (Skinner, 1982). The DAST-20 has an internal consistency of 0.92 (Cocco & Carey, 1998), and was found to have a test–retest reliability of .78 ($n = 45$) (El-Bassel, Schilling, Schinke, Orlandi, Wei-Huei, & Back, 1997).

Procedure

Social workers and program coordinators from several local community centers were contacted by the primary researcher to recruit participants. Of the groups contacted, staff from the Salvation Army's Wiseman Centre Shelter, and the John Howard Society of Newfoundland and Labrador C-Step rehabilitation program agreed to facilitate the study.

For participants, administration of the questionnaires took place during one session. A brief 2-3 minute presentation, introducing the investigator and the premise of the study and giving instructions for completion of the questionnaires, was given before the distribution of the consent form and questionnaires. Participants were not given a time limit to complete the survey; however, most completed all measures included in the packet within 30 minutes.

The current research was a questionnaire-based study that used data from five measures as part of a larger package. Questionnaire packages consisted of a consent form, a demographics information form, the SCMS, the DASS-21, the MAST, and the DAST-20 from the current study, as well as additional measures used as part of concurrent research utilizing the same population. These additional measures included the Cognitive and Affective Mindfulness Scale-Revised (CAMS-R), The Positive and Negative Affect Schedule (PANAS), The Difficulties in Emotion Regulation Scale (DERS), and the Mindful Attention Awareness Scale (MAAS).

The questionnaire packages were numbered to ensure the anonymity of the participants. The order of the questionnaires used in this study were counterbalanced according to a Latin Squares design (Williams, 1949) along with the additional questionnaires included as part of the larger packet.

The consent form, which outlined details of the study, was at the front part of the package (see Appendix F). The participants were asked to print their name and to sign the form if they were interested in taking part. Participants who did not wish to participate in the study would leave the administration session at this point. Researchers and research assistants were present to address questions or concerns, or assist by reading items to

those who experienced difficulty in reading or comprehension of measurement items, at any time during the session. Participants who experienced any such difficulties were given individual attention by the primary researcher or a research assistant.

After the consent portion of the questionnaire package had been completed, participants were instructed to remove the consent forms, on which their name was written. At this point the researchers and assistant(s) collected and sealed the consent forms in an envelope. The packet was now only identifiable by the participant number marked on each measure. From this point on, there was no link between participant name and participant number. Upon completion, participants received an incentive that consisted of a five-dollar Tim Hortons gift card. Completed consent forms and measures were stored separately in a locked cabinet.

The study was granted ethics approval by the Interdisciplinary Committee on Ethics in Human Research (see Appendix G).

Results

Descriptive Statistics of Study Instruments

Descriptive statistics and reliability estimates were assessed for all of the study instruments. Results are presented in Table 1.

Table 1

Descriptive statistics and reliability estimates of the Self-Control and Self-Management Scale (SCMS), Depression Anxiety and Stress Scale (DASS-21), the Michigan Alcoholism Screening Test (MAST), and the Drug Abuse Screening Test (DAST-20), (N =53).

	Mean	SD	Range	Coefficient alpha
SCMS	53.823	12.931	30-80	.812
DASS-21	23.576	16.641	0-59	.958
DASS-21 Depression	7.882	6.525	0-20	.932
DASS-21 Anxiety	7.280	5.276	0-21	.811
DASS-21 Stress	8.387	5.887	0-21	.902
MAST	10.132	5.494	2-26	.881
DAST-20	8.849	5.99	2-20	.950

Note. SCMS = Self-Control and Self-Management Scale (Mezo, 2009); DASS-21 = Depression Anxiety and Stress Scale (Antony, Bieling, Cox, Enns, & Swinson, 1998); MAST = Michigan Alcoholism Screening Test (Selzer, 1975); DAST-20 = Drug Abuse Screening Test (Skinner, 1982).

Reliability analyses were conducted on all study instruments used in the current research. The coefficient alphas used in this study ranged from .811 to .958, indicating moderate to high internal consistencies (Nunnally, 1978).

Correlational Relationships

In advance of conducting moderation analyses addressing the hypotheses of this study, bivariate correlations were conducted across the full sample. To establish whether a correlational relationship existed between self-management and alcohol and substance use, a bivariate correlation analysis was carried out between the Michigan Alcohol Screening Test and the Drug Abuse Screening Test, with the Self Control Self-Management Scale. These analyses were conducted to ascertain whether self-management as a whole is correlated with substance dependence (see Table 2).

Table 2

Correlational analyses of the Self-Control and Self-Management Scale (SCMS, the Michigan Alcoholism Screening Test (MAST), and the Drug Abuse Screening Test (DAST-20), (N =53).

Measure	SCMS	DAST-20
DAST-20	-.34*	-
MAST	-.37*	.32*

Note. Pearson correlations; SCMS = Self-Control and Self-Management Scale (Mezo, 2009); DAST-20 = Drug Abuse Screening Test (Skinner, 1982); MAST = Michigan Alcoholism Screening Test (Selzer, 1975). *$p < .05$

Further bivariate correlations were conducted between the Self Control Self-Management Scale and the Depression Anxiety and Stress Scale and its subscales. These analyses were conducted to determine whether self-management as a whole is correlated with overall distress, depression, anxiety, and stress (see Table 3).

Table 3

Correlational analyses of the Self-Control and Self-Management Scale (SCMS, and the Depression Anxiety and Stress Scale (DASS-21), (N =53).

Measure	SCMS	DASS-21	DASS-21 Depression	DASS-21 Anxiety
DASS-21	-.36*	-		
DASS-21 Depression	-.26	.28*	-	
DASS-21 Anxiety	-.14	.21	.83*	-
DASS-21 Stress	-.11	.29*	.91*	.82*

Note. Pearson correlations; SCMS = Self-Control and Self-Management Scale (Mezo, 2009); DASS-21 = Depression Anxiety and Stress Scale (Antony, Bieling, Cox, Enns, & Swinson, 1998).

*$p < .05$

Self-Management as a Protective Factor

Was self-management a moderator? We examined whether the self-management moderated the relation between overall levels of distress, on the one hand, and alcohol and drug consumption, on the other. Following Aiken and West's (1991) guidelines for moderation tests, we conducted a regression analysis with the full sample evaluating the SCMS as a moderator of the relationship between the independent variable of overall distress, and the dependent variables of alcohol and drug misuse, respectively. The independent variable was centered. The variables entered for each analysis included the independent variable of overall distress, the proposed moderator of self-management, and the relevant interaction term (i.e., SCMS x DISTRESS).

The SCMS was not found to be a significant moderator between the overall distress score of the DASS-21 and the level of substance misuse of the DAST-20, however it was a significant moderator between the DASS-21 and the level of alcohol misuse reported in the MAST (see Table 4). The SCMS and DASS-21 accounted for 16% of the variance in scores (F (2, 47) = 4.39, $p < .05$). The interaction of the SCMS and DASS-21 was entered in the second step. The percentage change in variance accounted for was 9% (ΔF (1, 46) = 5.36, $p < .05$), rendering a total of 25% of the variance accounted for. Both of the predictors were statistically significant.

Table 4

Regression Analyses testing a moderational model between distress and alcohol using self-management as a moderator.

Independent	*B*	S.E.	*β*	*t*

Step 1				
SCMS	-.15	.06	-.35	-2.58*
Distress	.13	.14	.12	.91
Step 2				
SCMS x Distress	.02	.01	.30	2.32*

Note. SCMS = Self-Control and Self-Management Scale (Mezo, 2009); DASS-21 = Depression Anxiety and Stress Scale (Antony, Bieling, Cox, Enns, & Swinson, 1998); MAST = Michigan Alcoholism Screening Test (Selzer, 1975).

*$p < .05$

To probe this relationship further, the DASS-21 was broken down into its components, which consist of depression, anxiety, and stress. Moderation analyses were run between the respective subscales of the DASS-21 and the MAST. These analyses revealed that the SCMS was a significant moderator between the depression subscale and the MAST (see Table 5), but not between the anxiety and stress subscales and the MAST. The SCMS and DASS-21 depression subscale accounted for 16% of the variance in scores (F (2, 46) = 4.26, $p < .05$). The interaction of the SCMS and depression subscale was entered in the second step. The percentage change in variance accounted for was 13% (ΔF (1, 45) = 8.35, $p = .01$), rendering a total of 29% of the variance accounted for. Both of the predictors were statistically significant.

Table 5

Regression Analyses testing a moderational model between depression and alcohol using self-management as a moderator

Independent	*B*	S.E.	*β*	*t*
Step 1				
SCMS	-.15	.06	-.35	-2.48*
Depression	.10	.121	.12	.84
Step 2				
SCMS x Depression	.03	.01	.36	2.89*

Note. SCMS = Self-Control and Self-Management Scale (Mezo, 2009); DASS-21 = Depression Anxiety and Stress Scale (Antony, Bieling, Cox, Enns, & Swinson, 1998); MAST = Michigan Alcoholism Screening Test (Selzer, 1975).

*$p < .05$

Next we examined whether self-management moderated the relation between alcohol and drug consumption, on the one hand, and overall levels of distress, on the other. As in the earlier analysis, we followed Aiken and West's (1991) guidelines for moderation tests. A regression analysis evaluating the SCMS as a moderator of the relationship between the independent variables of alcohol and drug misuse, and the dependent variables of overall distress was conducted. The independent variable was centered. The variables entered for each analysis included the independent variable of alcohol or substance misuse, the proposed moderator of self-management, and the relevant interaction term (i.e., SCMS X MAST, SCMS X DAST-20).

These analyses revealed that the SCMS was not a significant moderator between the level of substance misuse as the dependent variable, and the overall distress as the independent variable. Conversely, it was a significant moderator between the level of alcohol misuse reported in the MAST as the dependent variable, and the DASS-21 as the independent variable (see Table 6). The SCMS and MAST accounted for 16% of the variance in

scores (F (2, 47) = 1.39, $p < .05$). The interaction of the SCMS and MAST was entered in the second step. The percentage change in variance accounted for was 18% (ΔF (1, 46) = 11.03, $p = .01$), rendering a total of 24% of the variance accounted for.

Table 6

Regression Analyses testing a moderational model between alcohol and distress using self-management as a moderator

Independent	*B*	S.E.	*β*	*t*
Step 1				
SCMS	.41	.45	.14	.91
Distress	-.19	.20	-.15	-.95
Step 2				
SCMS x Distress	.11	.03	.47	3.32*

Note. SCMS = Self-Control and Self-Management Scale (Mezo, 2009); DASS-21 = Depression Anxiety and Stress Scale (Antony, Bieling, Cox, Enns, & Swinson, 1998); MAST = Michigan Alcoholism Screening Test (Selzer, 1975).

*$p < .05$

To probe this relationship further, the DASS-21 was again broken down into its components; depression, anxiety, and stress. Moderation analyses were run between the MAST and the subscales of the DASS-21. These analyses revealed that the SCMS was a significant moderator between the depression subscale and the MAST (see Table 7). The SCMS and MAST accounted for 8% of the variance in scores (F (2, 46) = 2.04, $p > .05$). The interaction of the SCMS and MAST was entered in the second step. The percentage change in variance accounted for was 19% (ΔF (1, 45) = 11.91, $p < .001$), giving a total of 27% of the variance accounted for.

Table 7

Regression Analyses testing a moderational model between alcohol and depression using self-management as a moderator

Independent	*B*	S.E.	*β*	*t*	R^2	ΔR^2	df	ΔF	Δp
Step 1					.08		2, 46	2.04	.14
SCMS	-.11	.08	-.21	-1.38					
MAST	.15	.18	.13	.84					
Step 2					.27	.19	1, 45	11.91	.00
SCMS x MAST	.05	.01	.48	3.45*					

Note. SCMS = Self-Control and Self-Management Scale (Mezo, 2009); DASS-21 = Depression Anxiety and Stress Scale (Antony, Bieling, Cox, Enns, & Swinson, 1998); MAST = Michigan Alcoholism Screening Test (Selzer, 1975).

*$p < .05$

The SCMS was also shown to be a significant moderator between the anxiety subscale of the DASS-21 and the MAST (See table 8). The SCMS and MAST accounted for 3% of the variance in scores (F (2, 45) = 0.62, $p > .05$). The interaction of the SCMS and MAST was entered in the second step. The percentage change in variance accounted for was 17% (ΔF (1, 44) = 9.40, $p < .001$), yielding a total of 20% of the variance accounted for.

Table 8

Regression Analyses testing a moderational model between alcohol and anxiety using self-management as a moderator

Independent	*B*	S.E.	*β*	*t*
Step 1				
SCMS	-.04	.06	-.10	-.60
MAST	.09	.15	.10	.62
Step 2				
SCMS x MAST	.04	.01	.47	3.07*

Note. SCMS = Self-Control and Self-Management Scale (Mezo, 2009); DASS-21 = Depression Anxiety and Stress Scale (Antony, Bieling, Cox, Enns, & Swinson, 1998); MAST = Michigan Alcoholism Screening Test (Selzer, 1975).

*$p < .05$

Finally, the SCMS was a significant moderator between the stress subscale of the DASS-21 and the MAST (See Table 9). The SCMS and MAST accounted for 6% of the variance in scores (F (2, 44) = 1.38, $p > .05$). The interaction of the SCMS and MAST was entered in the second step. The percentage change in variance accounted for was 17% (ΔF (1, 43) = 9.69, $p < .001$), rendering a total of 23% of the variance accounted for.

Table 9

Regression Analyses testing a moderational model between alcohol and stress using self-management as a moderator

Independent	*B*	S.E.	*β*	*t*
Step 1				
SCMS	6.74	.08	.00	.00
MAST	.25	.17	.24	1.49

Step 2				
SCMS x MAST	.04	.01	.44	3.11*

Note. SCMS = Self-Control and Self-Management Scale (Mezo, 2009); DASS-21 = Depression Anxiety and Stress Scale (Antony, Bieling, Cox, Enns, & Swinson, 1998); MAST = Michigan Alcoholism Screening Test (Selzer, 1975).

*$p < .05$

Discussion

The purpose of the present research was to consider if symptoms of substance abuse and symptoms of anxiety and depression are related to each other in the context of a self-management framework. Self-management approaches for anxiety and depression and psychological symptoms have been shown to be an effective means of treating these symptoms (Mezo, 2009; Dobson & Dozois, 2001; O'Hara & Rehm, 1982; Rehm, 1977). Furthermore, comorbidity between these mood disorders and substance misuse has been well established (Liang, Chikritzhs, & Lenton, 2011; Bruce, Yonkers, Otto, Eisen, Weisberg, Pagano, & Keller, 2005; Kushner, Abrams, Thuras, & Hanson, 2000; Febraro & Clum, 1998). By understanding the processes of substance misuse and self-management together, we increase the degree to which we understand substance use and mood disorder trajectories as they relate to self-management.

The relationships were examined in a distressed sample drawn from two community groups in St. John's. The groups included The Salvation Army Wiseman Centre Men's Shelter, and the John Howard Society of Newfoundland and Labrador C-Step rehabilitation program. It was observed that (1) self-management moderated the

relationship between symptoms of depression and alcohol use when a depressed person consumes alcohol because they are depressed. (2) Conversely, it was shown that self-management did not moderate the relationship if you are an anxious person and you drink alcohol because you are anxious. (3) Alcohol misuse was significantly associated with depression and anxiety. When someone does not have a history of mood disorders, but developed an alcohol use disorder, then self-management can act as a moderator between alcohol use on one hand and depression, anxiety, and stress on the other. (4) Furthermore, self-management was not shown to be a significant moderator of any relationship between substance misuse and depression, anxiety, and stress. With the exception of the second and fourth observations, these results were consistent with the theory-based hypotheses.

The first aim of this investigation was to examine the relationships between levels of alcohol and substance misuse, self-management, depression, anxiety, and stress. Accordingly, bivariate correlations were performed between overall distress and its facets (depression, anxiety, and stress), alcohol misuse, drug misuse, and self-management. Self-management and distress were related in the current study. Moderate bivariate correlations support previous research that suggests that self-management is related to depression, anxiety, and stress (Mezo, 2009; Mezo & Short, 2012).

Self-management functions as a feedback loop comprised of three facets, which include self-monitoring, self-evaluation, and self-reinforcement. Self-monitoring occurs when one pays attention to one's own thoughts and behaviours, and provides an individual with the necessary information to establish realistic goals and evaluate his or her progress towards those goals (Bandura, 1991). It has been thought to be a prerequisite

for the following facets in the feedback loop (Rehm et al., 1981). Therefore, individuals who lack the ability to self-monitor their behaviours, evaluate their behaviours against an realistic internalized standard, or reward positive evaluations appropriately, may ultimately disrupt the steps involved in the self-management regulatory loop. In this instance, not only disrupting the way in which one copes with depression, anxiety, or stress, but also leading to the use of alcohol as an alternative coping mechanism to alleviate the distress symptoms. Similarly, when the self-management regulatory loop is disrupted among those with alcohol misuse issues, the result is alcohol consumption leading to increased levels of depression, anxiety, and stress.

Self-management was shown to moderate the relationship between symptoms of depression on one hand and alcohol misuse on the other, in that higher levels of self-management acted to reduce the strength of the relationship by operating as a protective factor. As such, the SCMS could be used to identify individuals who pose a risk to developing disordered alcohol use, based on identifying them as exhibiting depressive symptoms and poor self-management skills.

Self-management was also shown to moderate the relationship, between alcohol misuse on one hand, and symptoms of anxiety and depression on the other. Self-management was again shown to act as a protective factor in that high levels of self-management acted as a protective coping strategy and reduced the strength of the relationship. Those who are at an increased risk of developing depressive and anxious symptoms could be identified based on being able to identify them as having disordered alcohol use and poor self-management skills.

Consistent with expectations, these findings provide evidence of a trend suggesting that self-management is a significant moderator between depressive symptoms and alcohol misuse, as well as a moderator between alcohol misuse and anxious and depressive symptoms. The current study shows that those exhibiting high levels of self-management skills are better able to cope with distress, however these findings suggest that these same skills enable one to cope with substance misuse, as well. When an individual does not have a history of mood disorders, but develops an alcohol use disorder, then the relationship would likely be able to be moderated by the use of self-management. Conversely, if you are an anxious person and you drink because you are anxious, then self-management will not moderate the relationship. However, if you are depressed, self-management moderates the relationship between depression and alcohol misuse.

The overwhelming negative impact of substance abuse has led to the development of the learning model, which explains the comorbidity of substance use with depressive and anxious symptoms. Alcohol misuse has been understood in terms of a rewarding and regularly occurring behaviour that allows users to experience a hedonic feeling or temporarily escape from their reality. However, as one attempts to relieve emotional, psychological, or physical suffering, their dependence on alcohol grows across repeated administrations (Palfai, 2004). Additionally, alcohol use disorders were shown to be associated with depressive and anxious disorders in that alcohol use leads to the developments of these symptoms (Palfai, 2004). Based on these findings we can infer that those with alcohol use disorders have a significantly increased risk of developing

major depressive and anxious disorders, when self-management skills are not utilized as a protective factor.

Due to the high rate of co-occurring depressive and anxious disorders, and alcohol misuse, effectively screening patients presenting at treatment settings is critical, as early diagnosis and treatment can improve treatment outcomes (Liang, Chikritzhs, & Lenton, 2011). There is increasing pressure in both psychiatric and substance use treatment settings to assess patients quickly and efficiently, and as such, brief-screening tools for substance use disorders have been found to be useful in these health care settings. Commonly used measures include the MAST (Selzer, 1975), and the DAST-20 (Skinner, 1982), however, the use of the SCMS (Mezo, 2009) could also be utilized as a tool to identify individuals who are at an increased risk of alcohol misuse based on their reported levels of self-management, given the moderating relationship that self-management has with depressive and anxious symptoms and alcohol misuse.

Keeping in line with the learning model of addiction, the individual is capable of exercising self-control over his or her own behaviours affecting health outcomes, and as such is able to moderate and control substance use through self-management strategies. Thus, as a form of cognitive behavioural therapy, self-management interventions are not only efficacious with depression, and anxiety (Mezo, 2009; Febbraro & Clum, 1998), but the current research has shown that such interventions could also prove effective with treatment of excessive alcohol consumption.

Strengths and Weaknesses

A major strength for this study included the community sample that was used. There is a strong generalizability of the results based on testing of a community sample

made up of a distressed population. Also, the age range of this population was broad, which illustrates that these findings are consistent across the lifespan. However, a possible limitation with the sample lies in the fact that the sample size was small, consisting of 53 participants. A large sample size is crucial for decreasing the chance of a Type II error and increasing the power of detecting a significant effect. Having a larger sample would have increased confidence in assessing the moderating relationships of interest.

All of the measures used in this study demonstrated strong internal consistencies. A possible limitation to this study included the use of a single measure for each variable examined. Employing multiple measures might provide an increased understanding of the moderating effects between the variables of interest. Another possible limitation to this study was that all of the measures were self-report. First, the information obtained by the MAST and DAST-20 are subject to the limitations of all self-report-based assessments, such as literacy problems, memory failure, and social desirability response bias. Secondly, the study was not able to show significant findings with substance use, as has been identified with alcohol use. This is likely due to the illicit nature of banned substances, and participants reluctance to report their actual level of drug use, despite confidentiality.

Both the MAST and DAST-20 are face valid measures, and therefore, they are unable to detect attempts to distort or conceal alcohol and substance-use behaviours, respectively. In future research, as a means of controlling for this limitation, the use of a social desirability scale should be employed.

Future Directions

In terms of clinical practice, these results suggest that individuals with high levels

of alcohol misuse, depressive, and anxious symptoms exhibit the greatest deficits in self-management skills. It is imperative that individuals diagnosed with depressive or anxious symptoms, or symptoms of alcohol misuse, receive optimal treatment that targets their specific self-management deficits. This research suggests that individuals identified with these deficits might benefit from a therapy that specifically targets increasing the efficacy of self-management skills.

Self-management-based therapies are a relatively new form of cognitive behavioural treatment that is based on self-regulatory theory. The treatment consists of a self-management therapy approach in which the therapist aids the distressed individual in the development of self-regulatory skills (Kanfer & Schefft, 1988). The goal of the treatment is for the therapist to give early support, with the individual gradually relying more and more on their newly learned skills. Therefore, future research should assess whether individuals diagnosed with clinical levels of depression, anxiety, or alcohol misuse, might benefit from a therapy that directly targets their specific deficits in self-management skills, by examining the three facets of the SCMS (e.g. self-monitoring, self-evaluation, and self-reinforcement), rather than the SCMS as a whole.

More extensive research could also target known substance abusing populations. Samples for the current study were drawn from community centers with populations that were known alcohol users, with ties to alcohol specific rehabilitation programs. However, future research could be directed more towards populations that include known substance abusers as a means of assessing whether symptoms of drug misuse and of anxiety and depression are related to each other in the context of a self-management framework.

References

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions.* Thousand Oaks: Sage Publications.

Asbridge, M., Poulin, C., Donato, A., (2005). Driving under the influence of cannabis and motor vehicle collision risk: evidence from adolescents in Atlantic Canada. *Accident Analysis and Prevention, 37*, 1025-1034. doi: 10.1016/j.aap.2005.05.006.

Antony, M.M., Bieling, P.J., Cox, B.J., Enns, M.W., & Swinson, R.P., (1998). Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales in clinical groups and a community sample. *Psychological Assessment, 10,* 176-181. doi: 10.1037/1040-3590.10.2.176.

Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Reviews Psychology, 52*, 1-26. doi: 10.1146/annurev.psych.52.1.1.

Bandura, A. (1991). Social cognitive theory of self-regulation. *Organizational Behaviour and Human Decision Processes, 50*, 248-287. doi: 10.1016/07495978(91) 90022L.

Boschloo, L., Vogelzangs, N., Smit, J. H., van den Brink, W., Veltman, D. J., Beekman, A. F., & Penninx, B. H. (2011). Comorbidity and risk indicators for alcohol use disorders among persons with anxiety and/or depressive disorders: Findings from the Netherlands Study of Depression and Anxiety (NESDA). *Journal Of Affective Disorders, 131*, 233-242. doi: 10.1176/appi.ajp.162.6.1179.

Bruce, S. E., Yonkers, K. A., Otto, M. W., Eisen, J. L., Weisberg, R. B., Pagano, M., & Keller, M. B. (2005). Influence of Psychiatric Comorbidity on Recovery and Recurrence in Generalized Anxiety Disorder, Social Phobia, and Panic Disorder: A 12-Year Prospective Study. *The American Journal Of Psychiatry, 162*(6), 1179 1187. doi: 10.1176/appi.ajp.162.6.1179.

Carver, C.S., Lawrence, J.W., Scheier, M.F. (1996). *Striving and feeling: Interactions among goals, affect, and self-regulation.* (pp.11-52). Hillsdale, NJ, England: Lawrence Erlbaum Associates, Inc.

Davies, J. B. (1998). Pharmacology versus social process: competing or complementary views on the nature of addiction? *Pharmacology therapeutics, 80*(3), 265-275. doi: 10.1016/S0163-7258(98)00031-X.

De Ridder, D., & De Wit, J. (2006). Self-regulation of health behaviour: Concepts. Theories and central issues. In: De Ridder, D. & De Wit, J. (Eds.), *Self-regulation in health behaviour,* (pp. 1-23). Chichester, UK: Wiley. doi: 10.1002/9780470713150.

Dobson, K. S. (Ed.). (2010). *Handbook of Cognitive Behavioural Therapies (3rd ed.).* New York: Guilford Press.

Dobson, K. S., & Dozois, D. J. A. (2001). Historical and philosophical bases of the cognitive-behavioural therapies. In K. S. Dobson (Ed.), *Handbook of cognitive behavioural therapies* (2nd ed., pp. 3-39). New York: Guilford.

El-Bassel, N., Schilling, R., Schinke, S., Orlandi, M., Wei-Huei, S., & Back, S. (1997). Assessing the utility of the Drug Abuse Screening Test in the workplace. *Research on Social Work Practice, 7*, 99-114.

Febrarro, G. & Clum, G. (1998). Meta-analytic investigation of the effectiveness of self-regulatory components in the treatment adult problem behaviours. *Clinical Psychology Review, 18*, 143-161. doi: 10.1016/S0272-7358(97)00008-1.

Fischer, B., Dawe, M., Mcguire, F., Shuper, P., Jones, W., Rudzinski, K., & Rehm, J. (2012). Characteristics and predictors of health problems from use among high-frequency cannabis users in a Canadian university student population. *Drugs: Education, Prevention & Policy, 19*, 49-58. doi: 10.3109/09687637.2011.614970.

Flynn, P. M., & Brown, B. S. (2008). Co-occurring disorders in substance abuse treatment: Issues and prospects. *Journal Of Substance Abuse Treatment, 34*, 36-47. doi: 10.1016/j.jsat.2006.11.013.

Foxx, R. M., & Axelroth, E. (1983). Nicotine fading, self-monitoring and cigarette fading to produce cigarette abstinence or controlled smoking. *Behaviour Research And Therapy, 21*, 17-27. doi: 10.1016/0005-7967(83)90122-5.

Gibbs, L. E. (1983). Validity and reliability of the Michigan Alcoholism Screening Test: A review. *Drug and Alcohol Dependency, 12*, 279-285. doi: 10.1016/0376-8716(83)90071-6.

Harmon, T. M., Nelson, R. O., & Hayes, S. C. (1980). Self-monitoring of mood versus activity by depressed individuals. *Journal of Consulting and Clinical Psychology, 8*, 30-38. doi: 10.1037/0022-006X.48.1.30.

Harris, K.M., & Edlund, M.J. (2005). Self-medication of mental health problems: New evidence from a national survey. *Health Services Research, 40*, 117-134. doi: 10.1111/j.1475-6773.2005.00345.x.

Hepner, K. A., Hunter, S. B., Paddock, S. M., Zhou, A. J., & Watkins, K. E. (2011). Training addiction counselors to implement CBT for depression. *Administration And Policy In Mental Health And Mental Health Services Research, 38*(4), 313-323. doi: 10.1007/s10488-011-0359-7.

Heyman, G. M. (2009). Addiction: A disorder of choice. Cambridge, MA US: Harvard University Press.

Hyman, S. E. (2007). The Neurobiology of Addiction: Implications for Voluntary Control of Behaviour. *The American Journal of Bioethics,* 7(1).

Kanfer, F., & Karoly, P. (1972). Self-control: A behaviouristic excursion into the lion's den. *Behaviour Therapy, 3*, 398-416. doi: 10.1037/0021-843X.92.3.319.

Karoly, P. (1999). A goal systems-self-regulatory perspective on personality, psychopathology, and change. *Review of General Psychology, 3*, 264-291. doi: 10.1037/1089-2680.3.4.264.

Kessler, R. C., Nelson, C. B., McGonagle, K. A., Edlund, M. J., Frank, R. G., & Leaf, P. J. (1996). The epidemiology of co-occurring addictive and mental disorders: implications for prevention and service utilization. *American Journal of Orthopsychiatry, 66*, 17-31. doi: 10.1037/h0080151.

Kushner, M.G, Abrams, K., Borchardt, C. (2000). The relationship between anxiety disorders and alcohol use disorders: A review of major perspectives and findings, *Clinical Psychology Review, 20*(2), 149-171. doi:10.1016/S0272-7358(99)00027 6

Kushner, M. G., Abrams, K., Thuras, P., Hanson, K. L. (2000). Individual differences predictive of drinking to manage anxiety among non-problem drinkers with panic disorder. *Alcoholism: Clinical and Experimental Research, 24*, 448-458. doi: 10.1111/j.1530-0277.2000.tb02011.x.

Lagoni, L., Crawford, E., & Huss, M. T. (2011). An examination of the self medication hypothesis via treatment completion. *Addiction Research & Theory, 19*, 5. doi:10.3109/16066359.2010.525332.

Liang, W., Chikritzhs, T., & Lenton, S. (2011). Affective disorders and anxiety disorders predict the risk of drug harmful use and dependence. *Addiction, 106*, 1126-1134. doi: 10.1111/j.1360-0443.2011.03362.x.

Lovibond, S.H. & Lovibond, P.F. (1995). Manual for the Depression Anxiety Stress Scales. (2nd. Ed.) Sydney: Psychology Foundation. ISBN 7334-1423-0.

McKee, K. F. (1996). Differences in self-management behaviours among problem-drinking and nonproblem-drinking college students. *Journal of Alcohol and Drug Education, 42*, 35-42.

Mezo, P. G. (2009). The self-control and self-management scale (SCMS): Development of an adaptive self-regulatory coping skills instrument. *Journal of Psychopathology and Behavioural Assessment, 3*, 83-93. doi: 10.1007/s10862-008-9104-2.

Mezo, P. G., & Short, M. M. (2012). Construct validity and confirmatory factor analysis of the self-control and self-management scale. *Canadian Journal of Behavioural Science, 44,* 1-8.

Mirin, S.M., Weiss, R.D., Griffin, M.L., & Michael, J.L. (1991). Psychopathology in drug abusers and their families. *Comprehensive Psychiatry, 32,* 36-51. doi: 10.1016/0010-440X(91)90068-N.

Moller T, Linaker OM. (2010). Using brief self-reports and clinician scales to screen for substance use disorders in psychotic patients. *Nord J Psychiatry. 64*, 130-5. doi:10.3109/08039480903274423.

Morse, S. J. (2004). Medicine and Morals, Craving and Compulsion. *Substance Use & Misuse, 39*(3), 437-460. doi: 10.1081/JA-120029985.

Neuringer, A. (1981). Self-experimentation: A call for change. *Behaviourism, 9,* 79-94.

O'Hara, M., Rehm, L. (1982). Choice of immediate versus delayed reinforcement and depression. *Psychol Rep 50*(1), 925-926. doi: 10.2466/pr0.1982.50.3.925.

Ogeil, R. P., Rajaratnam, S. W., Phillips, J. G., Redman, J. R., & Broadbear, J. H. (2011). Ecstasy use and self-reported disturbances in sleep. *Human Psychopharmacology: Clinical And Experimental, 26*(7), 508-516. doi: 10.1002/hup.1233.

Palfai, T., (2004). Automatic processes in self-regulation: Implications for alcohol interventions. *Cognitive and Behavioural Practice,* 11(2), 190-201. doi: 10.1016/S1077-7229(04)80030-0.

Rehm, L. P. (1977). A self-control model of depression. *Behaviour Therapy, 8*(5), 787 804. doi: 10.1016/S0005-7894(77)80150-0.

Robinson, J., Sareen, J., Cox, B., & Bolton, J. (2011) Role of self-medication in the development of comorbid anxiety and substance use disorders: A longitudinal investigation. *Archives Of General Psychiatry; 68*(8), 800-807. doi: 10.1001/archgenpsychiatry.2011.75.

Schuckit, M.A., & Hesselbrock, V. (1994). Alcohol dependence and anxiety disorders: What is the relationship? *American Journal of Psychiatry 151*, 1723–1734.

Selzer, M. L. (1975) The Michigan Alcoholism Screening test (MAST): The quest for a new diagnostic instrument. American Journal of Psychiatry 3:176-181.

Skinner, H. A. (1982). The Drug Abuse Screening Test. *Addictive Behaviours, 7*, 363 371. doi: 10.1016/0306-4603(82)90005-3.

Skinner, H. A., & Sheu, W. (1982). Reliability of alcohol use indices: The Lifetime Drinking History and the MAST. Journal Of Studies On Alcohol, 43(11), 1157 1170.

Suttajit, S., Kittirattanapaiboon, P., Junsirimongkol, B., Likhitsathian, S., & Srisurapanont, M. (2012). Risks of major depressive disorder and anxiety disorders among Thais with alcohol use disorders and illicit drug use: Findings from the 2008 Thai National Mental Health survey. *Addictive Behaviours, 37*(12), 1395-1399. doi:10.1016/j.addbeh.2012.06.014

Tran, G.Q., & Smith, J.P. (2008). Comorbidity of social anxiety and alcohol use disorders: Review of psychopathology research findings. In: Stewart, S.H., and Conrod, P.J., Eds. *Anxiety and Substance Use Disorders: The Vicious Cycle of Comorbidity.* New York, NY: Springer, pp. 59–79.

Weiss, R.D., Griffin, M.L., & Mirin, S.M. (1992). Drug abuse as self-medication for depression: An empirical study. *American Journal of Drug and Alcohol Abuse, 18*, 121–129. doi: 10.3109/00952999208992825.

Williams, E. J. (1949): Experimental designs balanced for the estimation of residual effects of treatments. *Australian Journal of Scientific Research*, *2*, p. 149-168.

Zvolensky, M. J., Buckner, J. D., Norton, P. J., & Smits, J. J. (2011). Anxiety, substance use, and their co-occurrence: Advances in clinical science. *Journal Of Cognitive Psychotherapy, 25*(1), 3-6. doi: 10.1891/0889-8391.25.1.3.

Appendix A

Demographic Information Sheet

Participant: _____

Demographics

All responses are confidential. None of these responses will be associated with other information collected.

Age _____		
Sex	□ Male	□ Female
Ethnic Identity	□ Caucasian □ Asian □ Aboriginal	□ African-American □ Hispanic □ Other (please specify) _____
Religious Affiliation	□ Anostic/Athiest □ Buddhist □ Hindu □ Jewish	□ Muslim □ Protestant □ Roman Catholic □ Other (please specify) _____
Number of children _____	Number of children living at home _____	
Highest Educational Level Attained	□ Grade 8 or less □ Business, Trade, or Vocational school, rather than High school □ High school	□ Business, Trade, or Vocational school, after High school □ Bachelor degree in University (B.A., Bsc.) □ Post bachelorette education in University (M.A., Msc, Ph.D.)
Marital Status	□ Single □ Married □ Common Law	□ Divorced □ Other _____
Employment Status	□ Employed □ Unemployed	□ Self Employed
Estimated Annual Family Income	□ $0 - $2,100 □ $2,101 - $4,200 □ $4,201 - $6,200 □ $6,201 - $8,300 □ $8,301 - $10,400 □ $10,401 - $15,600 □ $15,601 - $20,800	□ $20,801 - $26,000 □ $26,001 - $31,200 □ $31,201 - $36,400 □ $36,401 - $41,600 □ $41,601 - $52,000 □ $52,001 - $78,000 □ $78,001 +

Appendix B

Self Control Self Management Scale

Participant:

SCMS

Please read each of the following statements and rate how well each statement describes you, using the following scale:

0 = Very undescriptive of me
1 = Somewhat/mostly undescriptive of me
2 = A little undescriptive of me
3 = A little descriptive of me
4 = Somewhat/mostly descriptive of me
5 = Very descriptive of me

		Very undescriptive of me	Mostly undescriptive of me	A little undescriptive of me	A little descriptive of me	Mostly descriptive of me	Very descriptive of me
1.	When I work toward something, it gets all my attention.	0	1	2	3	4	5
2.	The goals I achieve do not mean much to me.	0	1	2	3	4	5
3.	I become very aware of what I am doing when I am working towards a goal.	0	1	2	3	4	5
4.	I get myself through hard things by planning to enjoy myself afterwards.	0	1	2	3	4	5
5.	I know I can track my behaviour when working towards a goal.	0	1	2	3	4	5
6.	When I set important goals for myself, I usually do not achieve them.	0	1	2	3	4	5
7.	When I do something right, I take time to enjoy the feeling.	0	1	2	3	4	5
8.	I pay close attention to my thoughts when I am working on something hard.	0	1	2	3	4	5
9.	I silently praise myself even when others do not praise me.	0	1	2	3	4	5
10.	I do not seem capable of making clear plans for most problems that come up in my life.	0	1	2	3	4	5
11.	I make sure to track my progress regularly when I am working on a goal.	0	1	2	3	4	5
12.	The standards I set for myself are unclear and make it hard for me to judge how I am doing on a task.	0	1	2	3	4	5
13.	I congratulate myself when I make some progress.	0	1	2	3	4	5
14.	I keep focused on tasks I need to do even if I do not like them.	0	1	2	3	4	5
15.	I have learned that it is useless to make plans.	0	1	2	3	4	5
16.	I give myself something special when I make some progress.	0	1	2	3	4	5

Appendix C

Depression Anxiety and Stress Scale

Participant:

DASS-21

Please read each statement and circle a number 0, 1, 2 or 3 that indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

0 = Did not apply to me at all
1 = Applied to me to some degree, or some of the time
2 = Applied to me to a considerable degree, or a good part of time
3 = Applied to me very much, or most of the time

		Not at all	To some degree	To a considerable degree	Very much
1.	I found it hard to wind down.	0	1	2	3
2.	I was aware of dryness of my mouth.	0	1	2	3
3.	I couldn't seem to experience any positive feeling at all.	0	1	2	3
4.	I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion).	0	1	2	3
5.	I found it difficult to work up the initiative to do things.	0	1	2	3
6.	I tended to over-react to situations.	0	1	2	3
7.	I experienced trembling (e.g., in the hands).	0	1	2	3
8.	I felt that I was using a lot of nervous energy.	0	1	2	3
9.	I was worried about situations in which I might panic and make a fool of myself.	0	1	2	3
10.	I felt that I had nothing to look forward to.	0	1	2	3
11.	I found myself getting agitated.	0	1	2	3
12.	I found it difficult to relax.	0	1	2	3
13.	I felt down-hearted and blue.	0	1	2	3
14.	I was intolerant of anything that kept me from getting on with what I was doing.	0	1	2	3
15.	I felt I was close to panic.	0	1	2	3
16.	I was unable to become enthusiastic about anything.	0	1	2	3
17.	I felt I wasn't worth much as a person.	0	1	2	3
18.	I felt that I was rather touchy.	0	1	2	3
19.	I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat).	0	1	2	3
20.	I felt scared without any good reason.	0	1	2	3
21.	I felt that life was meaningless.	0	1	2	3

Appendix D

Michigan Alcoholism Screening Test

Participant:

MAST

The following questions concern information about your potential involvement with alcohol, not including drugs. Carefully read each statement and decide if your answer is "Yes" or "No". Then, circle the appropriate response beside the question. Please answer every question choosing the response that is mostly right. These questions refer to the past 12 months.

		Circle your response	
1.	Do you enjoy drinking now and then?	Yes	No
2.	Do you feel you are a normal drinker? ("normal" – drink as much or less than more other people)	Yes	No
3.	Have you ever awakened the morning after some drinking the night before and found that you could not remember a part of the evening?	Yes	No
4.	Does your wife, husband, a parent, or other near relative ever worry or complain about your drinking?	Yes	No
5.	Can you stop drinking without a struggle after one or two drinks?	Yes	No
6.	Do you ever feel guilty about your drinking?	Yes	No
7.	Do others think you are a normal drinker?	Yes	No
8.	Are you able to stop drinking when you want to?	Yes	No
9.	Have you ever attended a meeting of Alcoholics Anonymous (AA)?	Yes	No
10.	Have you gotten into physical fights when drinking?	Yes	No
11.	Has you drinking ever created problems between you and your wife, husband, a parent, or other relative?	Yes	No
12.	Has a family member ever gone to anyone for help about your drinking?	Yes	No
13.	Have you ever lost friends because of your drinking?	Yes	No
14.	Have you ever gotten into trouble at work or school because of drinking?	Yes	No
15.	Have you ever lost a job because of drinking?	Yes	No
16.	Have you ever ignored your obligations, your family, or your work for two or more days in a row because you were drinking?	Yes	No
17.	Do you drink before noon fairly often?	Yes	No
18.	Have you ever been told you have liver trouble? Cirrhosis?	Yes	No
19.	After heavy drinking have you ever had Delirium Tremens (D.T.s) or severe shaking, or heard voices, or seen things that are really not there?	Yes	No
20.	Have you ever been in a hospital because of drinking?	Yes	No
21.	Have you ever been a patient in a psychiatric hospital or on a psychiatric ward of a general hospital where drinking was part of the problem that resulted in hospitalization?	Yes	No
22.	Have you ever been seen at a psychiatric or mental health clinic or gone to any doctor, social worker, or clergyman for help with any emotional problem, where drinking was part of the problem?	Yes	No
23.	Have you ever been arrested for drunk driving, driving while intoxicated, or driving under the influence of alcoholic beverages? (If YES, How many times? _____)	Yes	No
24.	Have you ever been arrested, or taken into custody because of other drunk behaviour?	Yes	No

Appendix E

Drug Abuse Screening Test

Participant:

DAST-20

The following questions concern information about your potential involvement with drugs not including alcohol. Carefully read each statement and decide if your answer is "Yes" or "No". Then, circle the appropriate response beside the question. Please answer every question choosing the response that is mostly right. These questions refer to the past 12 months.

		Circle your response	
1.	Have you used drugs other than those required for medical reasons?	Yes	No
2.	Have you abused prescription drugs?	Yes	No
3.	Do you abuse more than one drug at a time?	Yes	No
4.	Can you get through the week without using drugs?	Yes	No
5.	Are you always able to stop using drugs when you want to?	Yes	No
6.	Have you had "blackouts" or "flashbacks" as a result of drug use?	Yes	No
7.	Do you ever feel bad or guilty about your drug use?	Yes	No
8.	Does your spouse (or parents) ever complain about your involvement with drugs?	Yes	No
9.	Has drug abuse created problems between you and your spouse or your parents?	Yes	No
10.	Have you lost friends because of your use of drugs?	Yes	No
11.	Have you neglected your family because of your use of drugs?	Yes	No
12.	Have you been in trouble at work because of drug abuse?	Yes	No
13.	Have you lost a job because of drug abuse?	Yes	No
14.	Have you gotten into fights when under the influence of drugs?	Yes	No
15.	Have you engaged in illegal activities in order to obtain drugs?	Yes	No
16.	Have you been arrested for possession of illegal drugs?	Yes	No
17.	Have you ever experienced withdrawal symptoms (felt sick) when you stopped taking drugs?	Yes	No
18.	Have you had medical problems as a result of your drug use (e.g. memory loss, hepatitis, convulsions, bleeding, etc.)?	Yes	No
19.	Have you gone to anyone for help for a drug problem?	Yes	No
20.	Have you been involved in a treatment program specifically related to drug use?	Yes	No

Appendix F

Informed Consent Form

Consent Form

Title: Drug and alcohol use, symptoms, and ways of coping.

Ross Connolly M.Sc. Candidate (Experimental Clinical)
Psychology Department, Memorial University of Newfoundland, (709) 864-8876
rconnolly@mun.ca

Sabrina Allani, M.Sc. Candidate (Experimental Clinical)
Psychology Department, Memorial University of Newfoundland, (709) 864-8876
sabrina.alani@mun.ca

The proposal for this research has been approved by the Interdisciplinary Committee on Ethics in Human Research at Memorial University of Newfoundland (ICEHR). If you have any ethical concerns about the research (such as the way you have been treated or your rights as a participant), you may contact the Chairperson of the ICEHR at icehr@mun.ca or by telephone at (709) 864-2861. For further questions about this study please contact the research supervisor, Dr. Peter Mezo Department of Psychology, Memorial University of Newfoundland, (709) 864-4345.

Purpose: a study into the relation between signs of drug and alcohol use and ways of coping with them. This study will involve you filling out some short questionnaires.

Duration: This study should take approximately 30-45 minutes to complete.

Potential risks: You are not required to continue the study if you experience discomfort or anxiety during any part of it, or if you feel uncomfortable. In the event that you feel stress, we ask that you please contact the Health and Community Services Crisis line at 1-888-737-4668, where a counsellor will be available to speak with you.

Benefits: Your participation in this study will be helping in research on thinking and behavior.

Anonymity and confidentiality: The data collected in this study are coded with a number that is not connected with your name and therefore all data are anonymous. The data gathered will be used by researchers associated with this project for the purpose of papers, presentations, and teaching material. Data will be securely stored on Memorial University Campus for a period of at least five years. The informed consent forms will be kept separate from your questionnaires once returned. All informed consent forms will be stored on campus in a locked filing cabinet. Please do not write your name anywhere on the questionnaires.

Right to withdraw: Your participation in this study is voluntary. You have the right to not answer any question or to leave the study.

Signatures: I have read the above description and I understand that the data in this study will be used in research publications or for teaching purposes. My signature indicates that I agree to participate in this study. I also confirm that I have reached the age of 19 years.

Participant's name _____ Date _____

Participant's signature _____

Visit www.mun.ca/psychology/miriam/home/ to view a synopsis of the results of this study. Please remove the completed Informed Consent Form from the experimental package and return to the researcher before beginning the study.

Appendix G

Interdisciplinary Committee on Ethics in Human Research Approval Letter

MEMORIAL UNIVERSITY

Interdisciplinary Committee on Ethics in Human Research (ICEHR)

Office of Research · IIC2010C
St. John's, NL Canada A1C 5S7
Tel: 709 864-2561 Fax: 709 864-4612
www.mun.ca/research

ICEHR Number:	**2012-301-SC**
Approval Period:	**March 5, 2012 – March 31, 2013**
Funding Source:	Pending
Responsible Faculty:	Dr. Peter Mezo Department of Psychology
Title of Project:	***Drug and alcohol use, symptoms, and ways of coping***

March 5, 2012

Mr. Ross Connolly
Department of Psychology
Memorial University of Newfoundland

Dear Mr. Connolly:

Thank you for your email correspondence of March 2, 2012 addressing the issues raised by the Interdisciplinary Committee on Ethics in Human Research (ICEHR) concerning the above-named research project.

The ICEHR has re-examined the proposal with the clarification and revisions submitted and is satisfied that concerns raised by the Committee have been adequately addressed. In accordance with the *Tri-Council Policy Statement on Ethical Conduct for Research Involving Humans (TCPS2)*, the project has been granted *full ethics clearance* for one year from the date of this letter.

If you intend to make changes during the course of the project which may give rise to ethical concerns, please forward a description of these changes to Mrs. Eleanor Butler at icehr@mun.ca for the Committee's consideration.

The TCPS2 requires that you submit an annual status report on your project to the ICEHR, should the research carry on beyond March 31, 2013. Also to comply with the TCPS2, please notify us upon completion on your project.

We wish you success with your research.

Yours sincerely,

M. Shute, Th.D.
Chair, Interdisciplinary Committee on
Ethics in Human Research

MS/eb

copy: Supervisor – Dr. P. Mezo, Department of Psychology