

PERSONALITY CHARACTERISTICS, LOCUS OF CONTROL, AND LIFE STRESS AS
FACTORS IN RELAPSE AND RECOVERY IN A SUBSTANCE ABUSE SAMPLE

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A thesis submitted in partial fulfillment
of the requirements for the degree of
Masters of Arts (MA) in Psychology

Faculty of Graduate Studies
Laurentian University
Sudbury, Ontario, Canada

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THESIS DEFENCE COMMITTEE/COMITÉ DE SOUTENANCE DE THÈSE
Laurentian University/Université Laurentienne
Faculty of Graduate Studies/Faculté des études supérieures

Title of Thesis Titre de la thèse	Personality Characteristics, Locus of Control and Life Stress as Factors in Relapse and Recovery in a Substance Abuse Sample	
Name of Candidate Nom du candidat	Hull, Joshua	
Degree Diplôme	Master of Arts	
Department/Program Département/Programme	Psychology	Date of Defence Date de la soutenance May 13, 2015

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Abstract

A set of psychometric tests were administered to a sample of individuals accessing addiction services. This study sought to 1) explore personality, locus of control, and life stress in relation to the duration of abstinence from substance abuse, and 2) determine if there were any aspects of personality that were common among those with either long or short bouts of achieved sobriety. Seventy-two chemically dependent men and women in a Northern Ontario, Canada sample participated in the study. Few differences were found between sobriety groups. Statistically significant gender differences were found on the MMPI-Repression scale and the MMPI-Masculine/Feminine scales. Significant personality differences were also found between individuals who were receiving mental health related prescription medication on the MMPI scales of Hypochondriasis, Depression, Hysteria, Psychopathic Deviant, and Psychasthenia. Further significant differences were found between individuals who had a mental health diagnosis on the MMPI scales of Hypochondriasis, Depression, Hysteria, Psychopathic Deviant, Paranoia, Psychasthenia, Schizophrenia, and Anxiety.

Keywords: substance abuse; personality

Acknowledgement

I wish to extend my sincere gratitude and appreciation to my thesis committee, Dr. P.M. Valliant, Dr. M. Persinger, and Dr. M. Lariviere, whose guidance and support was instrumental in the completion of this thesis. Additional thanks to Dr. Jeffrey Abracen for his time and support as external examiner for this research project.

I would also like to thank the participating substance abuse treatment centers for allowing me into their organizations to complete this research with individuals who access their services. Each visit was made welcoming by both staff and the participants.

Further, I would like to thank Rose Ann Kozinski whose advice and statistical assistance during the course of my data analysis was very much appreciated.

Finally, I would like to thank Stacy Beth Gvozdanovic for her continued support, love, and patience throughout the past few years. She never gave up her belief in me, which strengthened my resolve in the completion of this project.

This paper is dedicated to the individuals who experience substance abuse issues and their families. Recovery is not without hope.

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CHAPTER I

Introduction

Addiction and substance abuse research has sustained attention due to the devastating social and physical effects associated with excessive consumption. The debilitating nature of substance abuse has led researchers to formulate explanations of addictive behaviours, resulting in some efficacious interventions. A report published in 2013 estimated that \$14.6 billion per year was spent on alcohol related disorders in Canada. Specifically, \$7.1 billion was spent in lost productivity due to disability and premature death, \$3.3 billion for direct health care costs, and \$3.1 billion for direct enforcement costs (Canadian Center on Substance Abuse, 2013). Considering these costs, determining effective best practices for those with substance abuse issues is very important. This importance is not only a domestic in nature, as the impact of addiction is cross cultural. Substance abuse research has long been studied overseas, as seen in the development of a disease model of addiction in Britain decades ago (Parssinen & Kerner, 1980). Over time, research has attempted to define attributes of addiction, understand the facets of abusive substances, and explain the destructive behaviors associated with substance abuse (see Goodman et al., 1990; Flagler, Hughes, & Kovalesky, 1997; West, 2001 for review).

Fisher and colleagues (1998) found that 50%-60% of substance abusers began using within the first 1-3 months post treatment, and that 80% began using within 6 months post treatment. Other research demonstrates that this trend is relatively stable, as relapse rates are reported between 40% and 60% (McLellan et al., 2000; Moos et al.

2006). Thus, a high percentage of individuals with substance abuse issues tend to abstain for an average of approximately 4-24 weeks following a treatment program. Many who have previously gone through addiction treatment may require the same services in the future, which add to the associated cost of the addictive behavior. Considering the high health care costs and a high rate of relapse, studying substance dependent populations should continue to be a driving force of addictions research. There are several theoretical perspectives in the literature regarding substance abuse, including the identification and evaluation of personality influences and individual coping tendencies of those who are substance dependent.

Definition of Substance Abuse:

Substance abuse differs from recreational drug use in some key facets. Problem drug users' physical appearance and social behaviour tend to deteriorate and are identified negatively through an individual's persona and behaviour, whereas this is not always the case for recreational drug users (Parker et al., 2002). Dependency and continued drug use despite negative consequences are two key differences between substance abuse and recreational drug use. The National Institute on Drug Abuse (2012) defines drug dependency as,

A chronic, relapsing brain disease that is characterized by compulsive drug seeking and use, despite harmful consequences. It is considered a brain disease because drugs change the brain in structure and function. These brain changes can be long lasting and can lead to many harmful, often self-destructive, behaviours. (p.1)

Within the scope of the current study, note that the term drug dependency and substance abuse will be used as noted in the addiction literature. The terms 'substance abuse' and 'drug dependency' will include abuse or dependency related to the following substances: marijuana, lysergic acid diethylamide, cocaine, heroin, alcohol, and prescription medications such as morphine, benzodiazepine, or opiate derivatives.

Theories of Substance Abuse

Decades of theoretical work have explored the characteristics of addiction and substance abuse (Manganiello, 1978; McCormick, 1998; Witkiewitz et al., 2010). Numerous theories have been posited in an attempt to explain the destructive patterns of behaviour. However, no single theory has been able to fully explain 'substance abuse'. The considerations regarding biological, psychological, and societal factors are too diverse to explain in a single theoretical framework. Research to date provides a comprehensive review of the theories of addiction. Robert West (2001) identified a five group classification system to examine the vast amount of literature on the subject. The first group of the theories address the more broad aspects of addiction, which include biological, psychological, and social focuses (i.e. bio-psycho-social approaches). The theories captured in this group include research projects that are associated with pleasure/pain, coping, compulsion, psychoanalysis, self-medication, disease, reinforcement, and failure to self-regulate (West, 2001). Each of these theories has led to studies which have demonstrated significant results to partially explain addictive tendencies, yet each perspective approaches the topic differently. For example, Dickerson et al. (1989) described addiction in the form of gambling and dependency

where an individual develops addictive behaviours through conditioning, while others have studied biological considerations regarding the underlying mechanisms of addiction where the neurotransmitter dopamine is described to play a key role in the molecular mechanisms of at least some addictions (Betz et al., 2000), leading to more questions and more studies. Examining the biological, psychological, and social variables associated with substance abuse has increased the overall understanding of addictive behaviours. Also, research has shown potential links to varying substance use motives for individuals with severe mental illness such as schizophrenia, schizoaffective disorder, major depression, and bipolar I disorder (O'Hare et al., 2012). This research demonstrated that those reporting a mood disorder diagnosis also reported greater substance use, more substance related problems, and escape motives for increased substance usage (O'Hare et al., 2012).

The second grouping includes theories that attempt to explain why specific stimuli tend to facilitate addictive behaviours more than other types of stimuli. Behavioural studies have addressed learning concepts such as conditioning and reinforcement regarding stimuli (Bradizza et al., 1994), and sensation concepts such as sensitization, where individuals seek drug use as a way of achieving and maintaining positive sensations (Kalivas et al., 1998). While these theories provided great insight and led to increasingly effective addiction treatments, other theorists sought to further understand the biological constructs of how the substance affects human physiology. Robinson et al. (1993) took the sensitization perspective and discussed the physiological desire to ingest drugs from a neurological perspective, demonstrating physiological reactions to drug ingestion leading to addictive behaviours. Fattinger et al.,

(1997) studied tolerance to nicotine and described an increased consumption trend as individuals became increasingly tolerant to the drug. Similar research has been conducted with cocaine (Kreek et al., 1996), and the effect of dopamine to the addictive nature of a substance (Kuhar et al., 1991). Focussing on stimuli that tend to give pleasure, relief or excitement, as well as stimuli that have positive and negative reinforcing properties (i.e. drugs or alcohol) (West, 2001) is central to this perspective. Identifying and explaining how stimuli or substances in this case, provides relief or pleasure for an individual is crucial to understanding the addiction process. Common examples would include psychotropic medications that are prescribed to relieve anxiety (negative state) such as benzodiazepines (relief).

Theories that seek to understand why particular individuals are more susceptible to substance abuse comprise the third grouping. The focus of this research looked at genetic components, decision making tendencies, attachment, ethnicity, gender, and personality characteristics (West, 2001). Theories classified under this grouping tend to bring the focus back to an individual's characteristics, both physically and psychosocially. Here, the effect of genetics in addictive behavior is well documented in the literature (Cunningham et al., 1992; True et al., 1997; Cheng et al., 2000). These studies discussed genetic differences in reward systems as well as potential susceptibility to addictive behaviours. This viewpoint is often seen as in debate with theories discussing environmental factors of addiction. Some of the demographic information collected as part of the current thesis is related to this group of theories. Information such as gender, ethnicity, and other demographics were collected and statistically analyzed for potential differences.

Further research by Kopera and colleagues (2014) found that one's emotional processing may also be related to drinking severity and relapse. Those who have more difficulty identifying and regulating emotions tended to report higher rates of drinking and longer duration of heavy drinking (Kopera et al. 2014).

The fourth grouping of theories describe the environmental aspects contributing to addiction such as stress, physical environment, social roles, regulation of self, economics, social setting, social class, effect of family, and traumatic experiences (West, 2001). This grouping moves away from a focus on the individual and moves towards an explanation of how someone can be affected by stress and traumatic or stressful experiences. Sinha (2008) looked to explore the effects of chronic stress on drug use and vulnerability to addiction wherein he described increased reported drug use with increased levels of stress. Earlier studies found that the effects of work stress on alcohol consumption and absenteeism were related, with increases in work stress tending to be associated with increased substance use and time away from work (Vasse et al., 1998). These types of studies provide evidence for both genetic and environmental factors to addiction. The present study addresses stress through a standardized psychological assessment of perceived life stress, and thus also seeks to understand addiction from this theoretical grouping scheme.

The final grouping of theories that has been identified in the literature looks at the process of relapse and recovery. This grouping included studies addressing pharmacotherapy, coping ability, conditioned learning, effect of expectancy and sensitization, social marketing, and drug anticipation (Prochaska et al., 1992; West, 2001). A portion of this thesis addresses whether or not an individual has received a

prescription. While this data was not of primary focus, it does not reduce the validity of capturing the information for analysis herein.

Personality and Substance Abuse

Personality and its relationship to substance abuse and dependency has been well documented in addictions literature. In consideration of the importance of one's personality characteristics to their daily functioning, researchers have attempted to explain many problematic aspects that are associated with addiction.

One such aspect is that of relapse following a period of sobriety or abstinence from the alcohol or drug of choice. Researchers have attempted to build an understanding of why individuals tend to chronically relapse. To this end, the potential importance of personality to one's chances of successfully completing of a treatment program has been well cited (Fisher et al., 1998; Janowsky et al., 2001; McNiel et al., 2005; Witkiewitz & Wu, 2010). More specifically, Fisher and colleagues (1998) found that a substance abuse sample differed most significantly from a normative sample on the personality characteristics of Neuroticism and Conscientiousness, as measured using the NEO-Personality Inventory, and that the scores on Extroversion, Openness and Agreeableness were not significantly different than the normative reference sample (Fisher et al., 1998). Yet, competing evidence presented by McCormick and colleagues (1998) has shown that substance abusers, while remaining average in Extroversion and somewhat lower on Openness, were substantially lower on Agreeableness and Conscientiousness than a normative sample (McCormick et al., 1998). These are interesting findings, as they present both complimentary and contradictory results. This demonstrates that determining a common or shared set of characteristics which can be

used to understand and predict one's ability to maintain sobriety, may be difficult to capture in a single study.

In a sample of young adult drinkers, researchers found that low emotional stability was associated with risky internal reasons for drinking (Theakston et al., 2004). These reasons could range from wanting to eliminate one's feeling of loneliness and isolation, to wanting to increase positive internal states. Gaining an understanding of an individual's personality correlates could help explain why an individual continues to engage in an unhealthy pattern of alcohol or drug use.

Furthermore, another measure of personality has been well documented in the literature regarding individuals with substance abuse and dependency issues. The Minnesota Multiphasic Personality Inventory-168 (MMPI-168) is a widely used standardized measure of an adult's personality and psychopathology. Research with this psychometric tool dates back to the mid-to-late 1980's (see Shaffer et al., 1988), and it continues to be a useful psychometric test with clinical populations.

Kahn and colleagues (1987) studied a sample of homeless individuals, with the majority of these individuals stating that they used alcohol and drugs, and found elevated scores on the scales of schizophrenia, psychopathic deviance, depression and mania. These findings are consistent with more current research showing that individuals who overused medications had elevated scores on the MMPI-2 (Frederica et al., 2011). A commonly elevated scale amongst the substance abuse samples tends to be the depression scale (Kahn et al., 1987; Frederica et al., 2011).

Attribution and Substance Abuse

The current study sought to look at the attribution tendencies of a substance dependency group in order to determine if the sample group would demonstrate consistencies in responding. In a study performed by Manganiello (1978), substance abusers were compared to a non-addict control group. It was found that the substance abuse group differed most significantly on 1) self-esteem, 2) future time perspective and 3) locus of control; with substance abusers being significantly more *externally* oriented in their locus of control than the non-addict control group (Manganiello, 1978). It was demonstrated that one's propensity to attribute the positive outcomes of events to external factors is correlated with increased risk for developing addictive behaviours. Similar findings have been found in more recent studies regarding the influence of one's degree of externalization in relation to relapse and recovery in addiction (Hubicka et al., 2010).

Furthermore, Krueger et al. (2001) suggests that the degree of internalization and externalization, as well as their links to personality, are all useful to understand differences in common adult mental disorders, such as Substance Abuse Disorder. There appears to be a link between how one views their world (i.e. internal vs. external attributions), and the chances that they could develop a negative emotional scheme and subsequent substance abuse issue. The current study seeks to explore this relationship.

Stress and Substance Dependency

Sinha (2008) demonstrated that personality characteristics are only part of the equation regarding susceptibility to addictions. Sinha (2008) has discussed the strong epidemiological evidence demonstrating the correlation between stress and the development of addiction. Researchers state that moderate stress can increase the chance of positive outcomes whereby a stressful state can motivate positive behavior change. However, if one does not reduce stress, performance decreases as our coping mechanisms fail to relieve the stressor. One possible route to relieve this cognitive pressure is to consume substances including alcohol and drugs. Sinha (2008) states that negative life events are significantly associated with increased risk of substance abuse (Sinha, 2008). It was found that the cumulative number of stressful events in one's life was significantly predictive of alcohol and drug dependence in a dose-dependent manner, even after accounting for control factors (Sinha, 2008). Those who report experiencing more stressors in their lives within the past twelve months, also report increases in alcohol and drug use in proportion to the level of stress they are experiencing.

Researchers have also looked at personality correlates as moderators of how individuals respond to stress using the Five Factor Model of personality (Korotkov, 2008). One of the most significant findings was that neuroticism was found to moderate stress relationships across each stress measure. More specifically, 'emotionally stable' individuals under high stress/distress were better able to moderate the effects of stress and were less likely to become overwhelmed by stress than those characterized as 'emotionally unstable' (Korotkov, 2008). Additionally, it was found that 'introverts' tended

to moderate stress more efficiently than those 'extraverts' (Korotkov, 2008). This study did not discuss the implications of these findings in relation to individuals with addictions; however considering the relationship of stress with addictive behaviours, these findings are important to addictions research. These findings are especially important because in 2012, 22.7% (6.4 million) of Canadians ages 15 and older reported high levels of stress in their lives (Statistics Canada, 2013). This means that millions of individuals in Canada are susceptible to the negative physical and mental effects of stress.

Considering the demonstrated interplay between personality and stress (Korotkov, 2008), and stress and addictions (Sinha, 2008), the current study sought to assess these factors to obtain information that could be beneficial to addictions literature, as well as to clinicians and treatment centers alike.

Summary

Considering the pervasiveness of substance use and substance dependency, as well as the personal and social cost of addiction, interest in the topic has increased. The present study incorporates theoretical constructs from different perspectives including the bio-psychosocial perspective, the environmental perspective, individual differences, and the environmental perspective. Here it is suggested that behavior such as engaging in substance use or abuse may more readily become a solution to potential environmental stressors, especially if certain psycho-social factors such as poor coping skills are present.

Individuals with substance abuse issues tend not to fit into one category. Nor can they easily be described along one scale or continuum. The literature seems to present a more complex picture of substance dependency. This is a picture in which a whole host of variables including the person, the environment, and the chemical properties of a substance may interact to produce the addictive response.

Sinha (2008) posits that the perceived stress within someone's life can be used as a predictor of physical illness and potential substance abuse. Hubicka et al. (2010) asserts that those who are more externally oriented in their attribution style tend to be more prone to engaging in risky behavior such as substance use. While, Janowsky (2001) has demonstrated that several heritable personality variables seem to influence one's likelihood of substance dependency and relapse. Thus, the picture of addiction seems to be comprised of several core variables, all of which may interact to fuel addictive behaviours throughout one's life.

The literature shows that addiction is a complex mechanism which includes influences including the chemical composition of a substance, an individual's biological response to a substance, the associations made through attribution, personality attributes, and the social environment in which the addictive behavior is initiated and maintained. The implications of these findings are seen in the social services and health care costs incurred due to emergency medical services and hospitalizations as \$14.6 billion per year is spent on alcohol related disorders in Canada with \$3.3 billion used for direct health care costs, (Canadian Center on Substance Abuse, 2013).

Rationale for Proposed Study

The current study sought to examine personality variables and perceived life stress associated with substance dependency, and to examine differences between individuals based on duration of sobriety, duration of dependency, and demographic information including whether or not an individual has received a mental health diagnosis or a prescription.

Also, there are relatively few studies that focus specifically on exploring the psychological variables that may contribute to substance abuse behaviours, as they pertain to a the demographic being accessed. Researchers have demonstrated cultural differences in personality correlates in reference to European and American cultures compared to Asian and African cultures, while noting that differences did exist between cultures even within a shared geographical location (Allik et al., 2004). Finally, the information obtained through this study could be utilized in current Addiction Treatment Programmes to better aid both the addiction counsellors and the individuals with addictions, by allowing the program developers to understand the importance of personality in the development of a treatment plan, as well as foster any resiliency factors that the client may be lacking according to the findings of the present study.

Hypotheses/Objectives

The first objective was to explore the connections between personality, locus of control, life stress and one's tendency to abstain from using drugs or alcohol for longer periods of time. This researcher sought to detect differences in either social or

psychological domains as previous research demonstrated differences (Fisher et al., 1998; Janowsky et al., 2001; McNiel et al., 2005; Witkiewitz & Wu, 2010). The second objective was to determine if there were any significant differences in the sample based on other included measures.

Due to the inconsistencies in the literature, it is hypothesized that individuals with longer achieved sobriety will differ on scales of the MMPI-168, the IPIP, on locus of control orientation, and on the stress scale compared to those who have only achieved brief periods of sobriety. Specifically, those who have been able to achieve longer periods of sobriety will be more internally oriented, report lower amounts of life stress, and have few significant clinical indicators for psychopathology than those in active addiction.

CHAPTER II

METHOD

Measures

Personality Measures

Personality was assessed using the 168 item Minnesota Multiphasic Personality Inventory (MMPI-168; Overall and Gomez-Mont, 1974). This abbreviated version of the MMPI-567 item test has been used for general psychiatric screening. The MMPI-168 has been described as producing slightly better discrimination than the long-form MMPI (Overall, Butcher and Hunter, 1975), has been utilized in clinical and non-clinical samples (Overall, Butcher and Hunter, 1975), and takes approximately 35-60 minutes to administer. It yields information pertaining to 10 clinical scales: Hysteria, Schizophrenia, Depression, Hypochondriasis, Masculinity/Femininity, Social Introversion, Paranoia, Psychopathic Deviate, Mania, and Psychasthenia, as well as 3 validity scales: Lie, Consistency, and Defensiveness.

A second personality measure, the International Personality Item Pool (IPIP; Goldberg, 1999) measures the personality constructs of the NEO-Personality Inventory (NEO-PI; Costa & McCrae, 1992). The mean correlation between the IPIP scales and the corresponding scales of the NEO-PI-R ranges from .73 to .94 (Goldberg et al., 2006). This measure yields scores for the domains of extraversion (or surgency), agreeableness, conscientiousness, emotional stability, and Intellect (or Imagination), takes about 30-45 minutes to administer and has been used reliably in numerous studies of personality across a variety of research settings (see Clark et al., 2010 and Hastings et al., 2009).

Measures of Self-Attribution & Stress

In order to measure participants' attribution tendencies, the Internal Control Index (ICI; Duttweiler 1984) was used. The ICI is a 28 item self-report measure of locus of control (internal/external) that was developed in response to a need for a more reliable measure of an individual's locus of control (Duttweiler, 1984). The ICI has strong reliability with a reliability coefficient of .84 (Duttweiler, 1984). This measure was utilized due to its brevity and demonstrated reliability in assessing attribution tendencies. The ICI yields a score in the 28-140 range with larger numbers indicating a more internal Locus of Control (LoC). A score below the midpoint (84) indicates belief that external forces control what happens to an individual.

The Social Readjustment Rating Scale (SRRS; Holmes and Rahe, 1967) is a 43 item self-report measure originally developed to examine the relationship between life events, which act as stressors and one's susceptibility to developing an illness. A score of 300 or more indicates a great risk of illness, 150-299 a moderate risk of illness, and less than 150 indicates a slight risk of illness (Holmes and Rahe, 1967). As Sinha (2008) has demonstrated, there is considerable data from studies utilizing normative and clinical samples that show a positive association between stress and ones vulnerability to addiction (Sinha 2008).

Demographic Measures

Participants provided information relating to age, relationship status, gender, education, employment status, ethnicity, drug of choice, duration of addiction, current mental health diagnoses, mental health related prescription medications, and duration of sobriety (as measured by reported date of last alcohol/drug use). As part of the current study, individuals who had reported receiving a mental health diagnosis (i.e. generalized anxiety disorder, major depression) from a qualified professional, and those who received prescription medication related to their mental health (i.e. benzodiazepine, SSRI) were included in the statistical analysis.

Information regarding duration of achieved sobriety was also used in the analysis to determine appropriate grouping for subsequent analysis. Achieved sobriety was measured in weeks, as reported by participants.

Administration

A confidentiality form was read by each participant prior to beginning any testing. Questions were read aloud for the five individuals who had difficulty with literacy or comprehension. Subjects were made aware that all information gathered during the course of this project would be kept confidential and that they would only be identified on their completed measures by an identification number. Participants were informed that they could withdraw from the study at any point without consequence.

Once informed consent was obtained, testing proceeded. The measures utilized in this project were randomly ordered into test packages containing the four (4)

measures and demographic questionnaire. Presenting each measure in a randomized order served to prevent any confounds regarding order effects.

Testing was conducted at the facilities in which the clients were receiving services. The testing conditions were quiet, comfortable, and free from distractions. On average, the length of time taken to complete the assessment package was approximately forty-five (45) minutes to one (1) hour. While most participants were able to complete the measures in one sitting, some were allowed to take a short intermission during testing to allow for bathroom and cigarette breaks, and stretching.

Participants

The participants were drawn from two (2) Northern Ontario cities. All participants met the inclusion requirements of chemical dependency, which meant that they each met the criteria for admission into substance abuse treatment programs, as they were registered in a treatment program or aftercare program. Male and female participants in Sudbury were recruited from local residential treatment and aftercare programs for men and suffering from severe chemical dependency.

Male and female subjects in Timmins were recruited from local treatment programs which offer substance abuse and concurrent disorders treatment for both men and women aged 16 and over. These facilities offer several chemical dependency programs including residential and day programs, as well as maintenance and safe bed programs.

Participants ranged in age from 16 to 63 years of age and were at these facilities for many reasons, ranging from personal choice to mandated requirements for job retention or legal obligations.

The same researcher attended and administrated the testing sessions and there was no remuneration for participation in the study.

General demographics were gathered (see Table 1) for each participant. Information obtained in the questionnaire included gender, education, ethnicity and marital status.

<u>Measure</u>		<u>Frequency</u>	<u>Percent</u>
Gender	Male	49	68.1
	Female	23	31.9
Education			
	Did not complete HS	20	27.8
	Graduated High School	16	22.2
	Some or all of College	29	40.3
	Other	7	9.7
Ethnicity			
	Non-Aboriginal	62	86.1
	Aboriginal	10	13.9
Marital Status			
	Single	49	68.1
	Common-Law	9	12.5
	Divorced	8	11.1
	Married	6	8.3
n=72			

Dependency demographics (see Table 2) included age, length of dependency, duration of sobriety achieved, mental health diagnosis, whether or not an individual received a prescription, identified themselves as chemically dependent or in active use, as well as their substance of choice. The length of time that participants identified as being chemically dependent ranged between three (3) months and 48.62 years, with a

mean of 13.57 years. The length of time that participants identified as being able to abstain from the use of drugs and alcohol ranged between one (1) week and 18 years (see Table 2 for review).

Table 2			
<i>Dependency Demographics</i>			
<u>Measure</u>		<u>Range</u>	<u>Mean (SD)</u>
Age (yrs)		17-63	34.51 (11.9)
Length of Dependency (wks)		12-2528	705.56 (536.45)
Sobriety Achieved (wks)		1-936	77 (138.44)
<u>Measure</u>		<u>Frequency</u>	<u>Percent</u>
Mental Health Diagnosis	Yes	38	52.8
	No	34	47.2
Prescription	Yes	38	52.8
	No	34	47.2
Identified Self as Chem. Dep.	Yes	64	88.9
	No	8	11.1
Identified in Active Use	Yes	65	90.3
	No	7	9.7
Able to abstain	Yes	47	65.3
	No	25	34.7
Substance of Choice	Alcohol	24	33.3
	Opiates	24	33.3
	Cocaine	21	29.2
	Other	3	4.2
n=72			

Mean and standard deviations for the dependent measures are presented in

Table 3.

Table 3		
<i>Mean and Standard Deviation for Dependent Measures</i>		
<u>Measure</u>	<u>Mean</u>	<u>Standard Deviation</u>
MMPI-L	4.56	2.86
MMPI-F	14.54	7.6
MMPI-K	10.48	4.33
MMPI-Hs	13.15	6.42
MMPI-D	29.27	7.23
MMPI-Hy	26.06	6.59
MMPI-Pd	25.59	5.66
MMPI-Mf	29.17	5.72
MMPI-Pa	14.77	5.17
MMPI-Pt	24.58	10.1
MMPI-Sc	27.25	12.91
MMPI-Ma	22.37	5.78
MMPI-Si	32.41	9.17
MMPI-A	3.9	1.94
ICI	91.44	17.96
SRRS	358.9	179.04
IPIPextra	59.29	12.49
IPIPagree	64.54	8.43
IPIPconsc	67.57	15.21
IPIPemstab	54.53	9.4
IPIPintel	64.68	10.45

Table 4 presents the associated t-score conversions for the MMPI-168 scales used in the analysis

Table 4		
<i>Mean and Standard Deviation for MMPI-168 (t-score conversions)</i>		
<u>Measure</u>	<u>Mean</u>	<u>Standard Deviation</u>
MMPI-L	51.69	9.44
MMPI-F	75.76	15.93
MMPI-K	46.58	7.94
MMPI-Hs	65.06	13.96
MMPI-D	75.99	14.88
MMPI-Hy	65.93	11.28
MMPI-Pd	75.73	11.97
MMPI-Mf	60.63	10.11
MMPI-Pa	69.87	15.11
MMPI-Pt	71.66	18
MMPI-Sc	76.92	20.14
MMPI-Ma	69.03	13.88
MMPI-Si	58.46	9.96
MMPI-A	38.68	2.82
n=71		

CHAPTER III

Results

Statistical Analysis

The Statistical Package for Social Sciences (SPSS v20) for Windows was utilized for data analysis. Two objectives were addressed through the statistical analysis. The first objective was to explore personality, locus of control, life stress, and duration of sobriety among the current sample of substance dependent individuals. The second objective was to determine if there were any significant differences in the sample based on other included measures of stress and attribution tendency.

All dependent measures were analyzed and it was confirmed that they were appropriate for parametric analysis, except duration of sobriety. Since duration of sobriety was a critical measure, nonparametric correlations were performed. No significant correlations were found. Correlations were analyzed to see if a predictive model could be identified but no significant correlations were found. Groups were thus identified based on achieved time in sobriety (refer to Figure 1). Due to increased variability within the sample population, predictive analyses were non-significant. All descriptive data was analyzed using Chi-square, however no significant results were found for these variables. Binary regression analysis utilizing abstinence as a dependent measure did not yield significance due to variability within the sample.

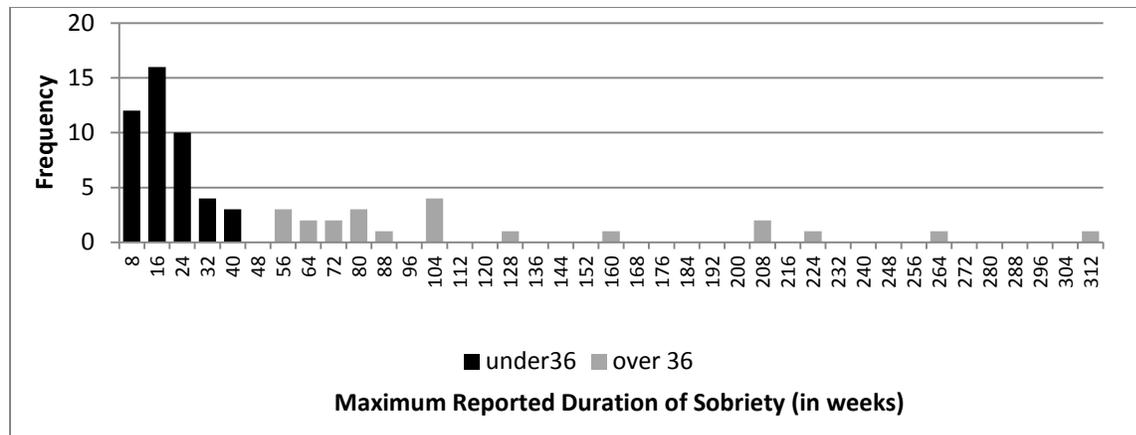


Figure 1: Distribution of Reported Sobriety

Note: Highly skewed distribution of reported sobriety was basis for grouping by under/over 36 weeks. This yielded groups of $n=44$ and $n=28$ respectively. Note also that the extreme data-points 364, 504, and 936 weeks are omitted from this chart.

Cluster analysis produced a two (2) group classification based on thirty-six (36) weeks or less of sobriety versus forty-four (44) weeks or more of sobriety. This grouping emerged at the sixth iteration and since it remained a stable grouping for at least five (5) iterations beyond this point, it was chosen as the demarcation point (see Figure 1). Any new groups formed were within the long-term sobriety grouping (44 weeks or longer) over these five (5) further grouping iterations. Since the 1-36 weeks grouping yielded a robust classification in the cluster analyses, this grouping cluster was utilized in the data analysis (1-36 weeks and 44-936 weeks).

Using this grouping variable, a comparison was done between groups on the dependent variables; MMPI-168, IPIP, ICI, SRRS, as well as the dependency demographic information.

Differences Between Sobriety Groupings

A series of Oneway Analyses of Variance (ANOVA)'s were conducted to determine differences between sobriety groups on the MMPI-168, IPIP, ICI, SRRS, and reported dependency demographic information. No statistically significant differences were found on these measures.

Gender

Oneway ANOVA's for the MMPI-168 scales showed gender differences for the measures of MMPI- Masculine/Feminine [$F(1,69)=8.69$ $p<.005$], with males scoring higher than females (62.96 vs. 55.78 respectively), and MMPI-Repression [$F(1,69)=16.5$; $p<.001$], with males scoring higher than females (30.4 vs. 25.2 respectively).

Gender differences were also found on one measure of the IPIP, emotional stability [$F(1,70)=5.87$; $p<.05$], with males scoring higher than women (56.31 vs. 50.74 respectively).

Binary logistic regression utilizing abstinence (yes/no) as the dependent measure and the emotional stability scale of the IPIP yielded no statistically significant findings due to excessive variability within the sample.

Further gender differences were also noted. Mean age was higher for males ($F(1,70)=4.65$; $p<.05$; Males: 35.5 Females: 29.8 years old respectively). Males reported longer times in addiction than females ($F(1,70)=6.57$; $p<.05$; 705.4 weeks vs. 404.6 weeks respectively). Women reported longer periods of achieved sobriety than men ($F(1,70)=4.71$; $p<.05$; 80 weeks vs. 37.3 weeks respectively).

Prescription

Oneway ANOVA's were performed to determine if there were any differences between those with mental health related prescriptions and those who did not report having a prescription. Results indicated significant differences for those who reported having a mental health related prescription compared to those who did not (refer to Figure 2), for the measures of MMPI-Hypochondriasis ($F(1,69)=7.74$; $p<.05$; 69.16 vs. 60.33 respectively), MMPI-Depression ($F(1,69)=4.22$; $p<.05$; 79.29 vs. 72.18 respectively), MMPI-Hysteria ($F(1,69)=7.43$; $p<.05$; 69.18 vs. 62.18 respectively), MMPI-Psychopathic Deviate ($F(1,69)=4.06$; $p<.05$; 78.34 vs. 72.73 respectively), and MMPI-Paranoia ($F(1,69)=6.87$; $p<.05$; 74.08 vs. 65.03 respectively).

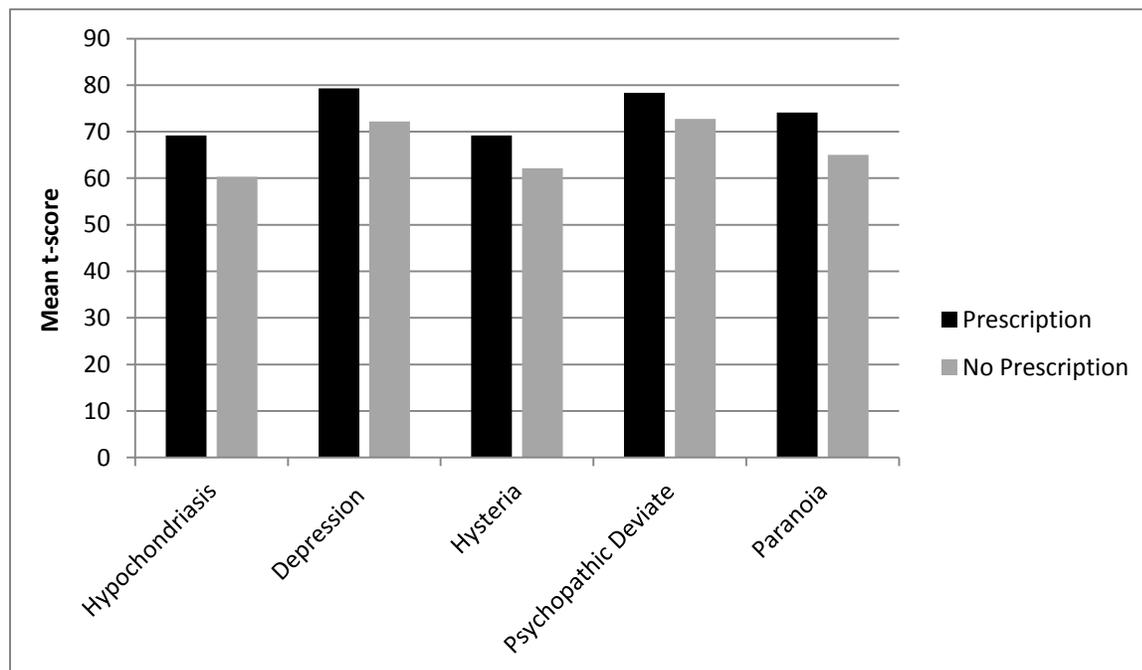


Figure 2: Mean Scores for Statistically Significant MMPI Scales for those who Received Prescription Medication and those Without a Prescription.

Note: Data reported in t-scores. All means are significantly different at $p<.05$.

Diagnosis

Oneway ANOVA's were performed to determine differences on the MMPI-168 variables for those who reported having a mental health diagnosis compared to those without a diagnosis (see Figure 3). Significant differences were found for those who had received a formal mental health diagnosis as they scored higher on the measures of MMPI-Hypochondriasis ($F(1,69)=8.06$; $p<.05$; 69.24 vs. 60.24 respectively), MMPI-Depression ($F(1,69)=5.7$; $p<.05$; 79.79 vs. 71.61 respectively), MMPI-Hysteria ($F(1,69)=6.78$; $p<.05$; 69.05 vs. 62.33 respectively), MMPI-Psychopathic Deviate ($F(1,69)=8.48$; $p<.05$; 79.39 vs. 71.52 respectively), MMPI-Paranoia ($F(1,69)=8.6$; $p<.05$; 74.53 vs. 64.52 respectively), MMPI-Psychasthenia ($F(1,69)=4.21$; $p<.05$; 75.66 vs. 67.06 respectively), MMPI-Schizophrenia ($F(1,69)=4.12$; $p<.05$; 81.34 vs. 71.82 respectively), and MMPI-Anxiety ($F(1,69)=5.68$; $p<.05$; 39.39 vs. 37.85 respectively).

ANOVA's were performed on the IPIP variables for those who reported having a mental health diagnosis and those who did not report having a diagnosis. Significant differences were found showing that those without a mental health diagnosis scored higher for the measures of Extraversion ($F(1,70)=8.69$; $p<.05$; 63.65 vs. 55.39 respectively), and Emotional Stability ($F(1,70)=6.98$; $p<.05$; 57.5 vs. 51.87 respectively).

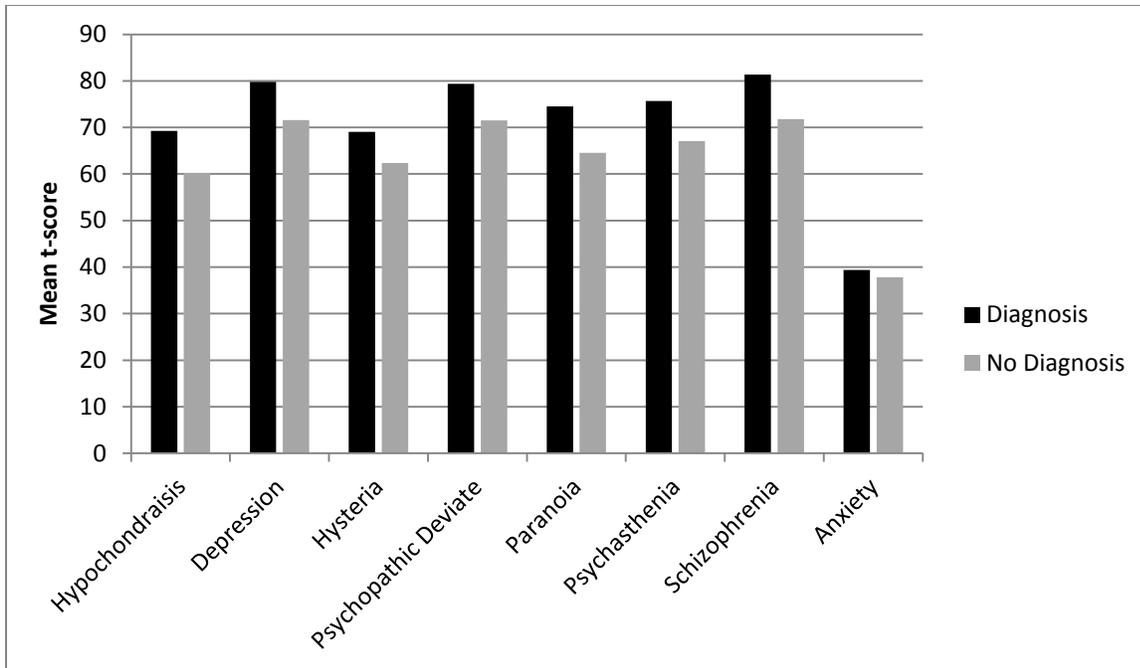


Figure 3: Mean Scores for Statistically Significant MMPI Scales for those who Received a Mental Health Diagnosis and those Without a Diagnosis.

Note: Data reported in t-scores. All means are significantly different at $p < .05$.

CHAPTER IV

Discussion

The purpose of the current study was to explore personality, locus of control, life stress and one's tendency to maintain sobriety for longer periods of time. The second objective was to determine if there were any significant differences in the sample based on dependency demographic information provided by questionnaire.

It was thought that individuals would differ on the measures of the MMPI-168, the IPIP, locus of control, and stress scale between sobriety groupings. Analysis of the data did not yield any significant differences based on sobriety time achieved. Researchers have reported inconsistencies regarding results pertaining to different groups of substance abusers, but overall that personality correlates such as impulsive sensation-seeking are common among substance use samples at varying stages of risk for substance abuse (Sher et al., 1991). Regardless of the amount of sobriety someone had achieved, their personality, stress, and locus of control scores were relatively heterogeneous. Therefore, there must be other unmeasured variables which were factors in achieved sobriety time within the current sample.

Personality traits are defined as relatively enduring patterns of behavior, thought, and feeling that are relatively consistent across a wide variety of situations and contexts, and they are not assumed to change at a rapid rate but rather reflect slow processes (Allemand et al., 2013). Considering this, one possible explanation for part of the present results is consistent with the Transtheoretical Model (Prochaska et al., 1992). The model describes a transformative and active process of change that involves

slow progression through a series of stages: precontemplation, contemplation, preparation, action, and maintenance (Velicer et al., 1998). Moving through these processes is related to motivational changes. Motivation is identified as being either intrinsically or extrinsically driven (Csikszentmihalyi et al., 2014), with immediate experiences tending to be intrinsically driven, making the behavior rewarding in the moment. Therefore, while personality is relatively stable over the course of one's adult life, motivational influences in responding are subject to potential change. Thus, the way one is motivated to respond may be similar to their same-stage counterparts, due to their similar readiness for change.

Measuring personalities of individuals in the same stage of change would therefore be lacking in breadth when determining how personality interacts with one's ability to be motivated sufficiently to stop the maladaptive behaviours associated with substance abuse. For example, those in the pre-contemplation stage of the Transtheoretical Model tend to avoid reading, thinking, or talking about their high risk behaviours (Velicer et al., 1998). In this stage, there is no intention or motivation to take any action regarding unhealthy behaviours. Alternatively, those in the action stage are characterized by having made specific life-style changes in recent history, as well as observable behaviour change to reduce risks associated with former unhealthy behaviours (Velicer et al., 1998). The differences in thought, behavior, and responding between individuals in these two separate stages would be more salient than differences between members at the same stage.

The participants recruited from drug dependency facilities tended to be in the Action stage of the Transtheoretical Model because they were attending these facilities for chemical dependency treatment. It should be noted that there may be other reasons for attending a treatment program, such as to fulfill employment agreements or due to pressure from loved ones. Considering this, differences in participant responding on the psychometric measures of personality, perceived life stress, and locus of control may have been more similar, which explains the lack of significant differences found between the different amounts of sobriety time achieved in the current study.

Subsequent analyses were conducted to explore further differences between the participants of the present study. Interestingly, several variables reached statistical significance. On the MMPI-168, males scored higher on the Masculinity/Femininity and Repression scales. This infers that male participants were more likely to 1) prefer gender specific tasks, and 2) repress or deny their feelings, emotions, or interests. Significant differences were also found on the emotional stability scale of the IPIP with men scoring higher than women, as is consistent with findings from Van Rooy and colleagues (2005) from a sample of 275 participants.

Females reported longer periods of achieved sobriety than males, with a difference of approximately 43 weeks, and males reported more time in addiction compared to females. These gender differences appear to commensurate with research by Becker and Hu (2008) who looked at gender differences in human and animal models, where females scored higher all of the phases of drug abuse, including

initiation, escalation of use, addiction, and relapse, while males tended to self-administer at lower doses.

Significant differences on several MMPI-168 variables were also found for those with a mental health diagnosis. In the present study, those who reported having a mental health diagnosis scored higher on the MMPI-168 scales of Hypochondriasis, Depression, Hysteria, Psychopathic Deviate, Paranoia, Psychasthenia, Schizophrenia, and Anxiety. This type of responding is common for individuals who 1) report non-specific complaints about nonspecific issues related to bodily functioning, 2) poorer morale and lack of hope, 3) exhibit shyness, 4) may exhibit general social maladjustment, 5) experience bouts of interpersonal sensitivity and suspiciousness, 6) may experience obsessiveness and bouts of worry, 7) and may experience greater anxiety than individuals who had not obtained a mental health diagnosis. These individuals were under the care of a psychiatrist or physician and had reported receiving a mental health diagnosis.

Considering the extensive literature review by West (2001), the current research adds to the relatively varied outcomes as measured in previous research. Theories that attempt to explain the phenomenon of addictive behaviors and addictive tendencies indeed cover a wide variety of etiologies. The findings from this research do not provide empirical support for the psychological aspect of addiction that can be measured using self report. West (2001) describes groups of theories looking toward biological constructs that may provide different insight into this area, as psychometrics as measured here does not capture the variability in an individual's achieved time

abstaining from substance use. Interestingly, the current findings do fall in line with what can be described as inconsistencies within addiction literature, as research has shown much variability in psychometric testing within this population (West, 2001).

The current results indicate those who did not report having a prescription related to mental health scored higher in extraversion and emotional stability as measured by the IPIP. This indicates those without prescriptions were extroverted, and reported less emotional disruption than those who reported as having a prescription. Interestingly, those who reported having a prescription scored higher on the MMPI-168 scales of Hypochondriasis, Depression, Hysteria, Psychopathic Deviate, and Paranoia. This infers that those who indicated that they had received a mental health related prescription reported similarly to individuals who 1) describe issues related to bodily functioning or feeling, 2) low morale and hopelessness, 3) shyness or neuroticism, 4) may exhibit social maladjustment behaviours, 5) report interpersonal sensitivity and suspiciousness. These findings are consistent with what would be expected for those who are under medical care of a psychiatrist or other mental health specialist.

As noted from the data, there were few significant differences between those who achieved below 36 weeks of sobriety and those who achieved greater than 36 weeks of sobriety. The participants in this study were rather heterogeneous with regards to their personalities, attribution tendencies, and life stress, regardless of how long they have achieved sobriety. Perhaps not surprisingly, those who received a mental health diagnosis and those who received a prescription related to their mental health scored higher on the clinical scales of the MMPI-168 of Hypochondriasis, Depression, Hysteria,

Psychopathic Deviate, Paranoia, Psychasthenia, Schizophrenia, and Anxiety. While these results speak to the effectiveness of the MMPI-168 as a general psychiatric tool, personality variables were not found to be related to duration of achieved sobriety.

Despite being demonstrated in previous research, no evidence was found to support the theory that one's emotional processing was related to their drinking severity and relapse (Kopera et. al. 2014). Due to the variability within the data, analysis pertaining to the emotional stability scale of the International Personality Item Pool did not yield statistically significant differences.

The objective to explore connections between personality, locus of control, and life stress as they relate to abstinence from substance use was not fully met, as none of the included measures bore statistical significance related to sobriety time achieved. Contrary to previous research citing individual differences (Fisher et al., 1998; Janowsky et al., 2001; McNiel et al., 2005; Witkiewitz & Wu, 2010), this researcher did not find evidence of any differences based on the included measures with regards to substance use. Thus, contrary to what was hypothesized here, individual differences were not found on the MMPI-168, the IPIP, locus of control scale, or the stress scale based on one's achieved sobriety.

Conclusion

The current study sought to investigate personality, locus of control, and life stress that were associated with duration of chemical dependency. Several studies pointed to the differences between those with less achieved sobriety and those with longer durations of sobriety on several personality variables (Fisher, 1998; McCormick,

1998; Janowsky, 2001), attribution tendencies (Manganiello, 1978; Hubicka et al., 2010), and life stress (Sinha 2008). From these findings, an examination of a Northern Ontario, Canada sample was conducted looking potential consistencies in participant personality profiles among sobriety groups.

The results showed that contrary to our hypothesis, no MMPI variables were significantly associated with duration of sobriety. Thus, findings citing significant personality differences amongst substance abuse samples were not replicated as noted in previous studies (Witkiewitz & Wu, 2010; Janowsky et al., 2001; Fisher et al., 2001).

Similarly, individuals with lower amounts of achieved sobriety did not score significantly different on any measure of the International Personality Item Pool relating to the big-five personality correlates. Thus, the IPIP did not explain differences in amount of time in sobriety contrary to what was predicted based on previous literature (Clark et al., 2010 and Hastings et al., 2009).

Studies have shown that individuals who are substance free are typically not extraverted (Manganiello, 1978; Hubicka et al., 2010). The results from this study were not consistent with previous findings citing differences in attribution amongst groups of substance abusers. There were no significant differences with regards to attribution tendencies as measured by the Internal Control Index between those with little durations of sobriety and those with more lengthy durations of sobriety.

Furthermore, finding no differences between the groups based on duration of sobriety regarding perceived life stress is contrary to the findings of Sinha (2008) who found those achieving sobriety were more externally oriented in their attributions. Earlier studies that examined the effects of work stress on alcohol consumption found that

increased stress leads to increased substance use (Vasse et al., 1998), no such patterns in substance use were found based on stress. Therefore, this study does not support any differences in attribution tendencies between individuals based on achieved sobriety time.

Several surprising findings were discovered that relate to gender, including whether or not an individual had received a mental health diagnosis, and whether or not an individual receives prescription medications related to mental health. Since previous literature has demonstrated that differences within this population exist with regards to personality, stress, and locus of control, the question considering the current researcher's findings would be to establish the key determinants to explain differences in relapse and maintained recovery. Potentially, measuring the responses of individuals who tend to be at the same stage of the Transtheoretical Model of Behaviour Change (Prochaska et al., 1992) did not allow for significantly different responses to be detected. This model has been used in numerous studies seeking to explain addiction (see DiClemente et al., 1998 for review). In the current study, participants may have been in the Action stage of the Transtheoretical Model, as they were motivated to seek substance abuse treatment, and therefore could have shared similar characteristics with those at the same stage of the model (Velicer et al., 1998).

Furthermore, the present study did not include physiological measures and the technology to measure changes in the brain as noted by NIDA (2012). Perhaps a portion of the explanation in addictive behaviour is found in the biological perspective.

Benefits/Implications for Future

Knowing that one's personality does not solely explain the duration of achieved sobriety indicates that more research is needed to explain variance in sobriety times. This is especially true considering the contradictory evidence pertaining to personality, locus of control, and stress regarding substance abuse.

Despite not detecting any differences amongst sobriety groups, significant differences on the MMPI-168 were found for those with a mental health diagnosis and those who receive mental health related prescription medications. Perhaps the tools utilized herein were not able to detect why some individuals can abstain following addiction while others are prone to relapse. Future studies that include additional measures beyond self-report personality measures, such as physiological measures, may allow for further understanding of this complex condition.

Limitations of the Study

There were several limitations in the current study. First, it is difficult to attract participants when undertaking sensitive research on substance abuse issues. During the research process, the researcher observed some individuals decline to participate due to lack of incentive, as stated by the potential participants. Without remuneration or some type of incentive, many individuals were indifferent to participation in this study. Therefore it is suggested to include an incentive, such as monetary compensation, to increase the motivation to participate.

The nature of treatment centers as well as many substance use programs focus on anonymity. Some participants refused to sign the informed consent document,

despite reassurances that their anonymity would be preserved, therefore they withdrew from participating, without penalty. Due to the sensitivity within this population to concerns of confidentiality and anonymity, obtaining accurate information becomes difficult. There remains the possibility that those who refuse to participate may offer insight into how to best approach and obtain valuable personal health information, so that these considerations are implemented in future research.

With regards to research design, a further limitation of the current project was that each subject was measured at one point in their journey through addiction and treatment. Utilizing a methodology that employed two testing times, say approximately 3-6 months after initial testing would have allowed for a more thorough analysis of differences in personality and life stress due to duration of sobriety, as well as address considerations of the Transtheoretical Model of Change (Prochaska et al., 1992) regarding motivational factors influencing responding. Thus, the present study may have yielded more robust results with a mixed methods structure such as multiple testing times within the same sample tested.

A final limitation of this study was the type of design where there was no experimental manipulation. Despite previous studies demonstrating differences in social and psychological measures based on duration of sobriety achieved, no such differences were detected with the current sample. This limitation is important to note because it demonstrates a caution regarding the use of pure psychometric measurement to explore substance abuse. Objective measurements such as body chemistry, as West (2001) describes in one branch of theories regarding substance use,

may provide a more in depth account of the variability in sobriety time one is able to achieve.

Future research is required, as there continues to be contradictory evidence in the areas of personality, locus of control, and perceived life stress. While the present study adds to the chemical dependency literature, many questions are left unanswered. Considering the Transtheoretical Model (Prochaska et al., 1992), it would be important to ensure that a future research paradigm take into account the motivational tendencies associated with each stage of change. Ensuring that participants are gathered across all stages of change (Prochaska et al., 1992; Velicer et al., 1998) would allow for a more complete and pointed data collection process, as the cognitive schema of those in pre-contemplation are different than that of those in the action or maintenance stage of change (Allemand et al., 2013). Therefore, collecting data from individuals in the pre-contemplation (active addiction-denial) stage should yield greater differences in responses compared to those in the maintenance stage of change.

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