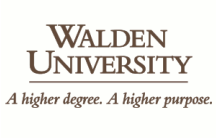

2018

The Effect of Gender and Narcotic or Stimulant Abuse on Drug-Related Locus of Control

Yolanda Rene Travis
Walden University

Walden University

College of Social and Behavioral Sciences

This is to certify that the doctoral dissertation by

Yolanda René Travis

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

Review Committee
Dr. Richard Cicchetti, Committee Chairperson, Psychology Faculty
Dr. Charles T. Diebold, Committee Member, Psychology Faculty
Dr. Walter McCollum, University Reviewer, Psychology Faculty

Chief Academic Officer
Eric Riedel, Ph.D.

Walden University
2018

Abstract

The Effect of Gender and Narcotic or Stimulant Abuse on Drug-Related Locus of Control

by

Yolanda René Travis

MS, Walden University, 2010

BS, California State University-Sacramento, 2008

BA, San Francisco State University, 2005

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Clinical Psychology

Walden University

May 2018

Abstract

Substance use disorders cause significant neurological damage, cognitive impairment, and maladaptive behaviors that negatively affect a person's quality of life. The purpose of this study was to explore the effect gender and primary drugs have on locus of control. Generalized expectancy theory helped to explain the behavior of patients diagnosed with substance use disorders and their inability to control ongoing drug use. The research question focused on to what extent drug-related locus of control scores differ by primary drug (narcotic vs. stimulant), gender (male vs. female), and their interaction. Data measuring locus of control from 553 participants provided a subset of 410 participants who identified narcotics or stimulants as their primary drug. A 2x2 full factorial ANOVA was conducted. The results of this study indicated there is a significant interaction between primary drug use and gender. The results could have positive social change implications for the addiction field because of the value of understanding the interdependency of internal-external thought processes related to drug use, the ability to change stigma associated with addiction and gender, and the value of understanding the need for individualized treatment as locus of control shifts from external to internal. It is recommended that the drug-related locus of control instrument become part of treatment protocol along with evidence-based interventions.

The Effect of Gender and Narcotic or Stimulant Abuse on Drug-Related Locus of Control

by

Yolanda René Travis

MS, Walden University, 2010

BS, California State University-Sacramento, 2008

BA, San Francisco State University, 2005

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Clinical Psychology

Walden University

May 2018

Dedication

The African proverb that it takes a village to raise a child can be translated to: It takes a community to nurture a budding psychologist. This is true for my journey toward the completion of the Ph.D. program. This work is dedicated to the community of family, associates, and professionals who lifted, encouraged, supported, and guided me through the tunnel of discovery when I could no longer see my way forward toward the light.

I would like to give special thanks to my mother, Mary Travis, who has always been there for me and personifies motherhood. You have been there for me from birth, nurturing and inspiring me to be the best I can be, and you are still nurturing now that I am an adult. When I need you the most, you are always there, emotionally, financially, and in spirit. I truly love you.

A part of this journey is inspired by my only child, Christopher Lee Herbert. I have always believed that every generation must improve and be better than the last so that the next generation can flourish and be better for the next generation. I have done my best to demonstrate the value of education in hopes that you will continue to encourage my grandchildren to embrace learning and exploring the world in which they live.

To my siblings, Vajezatha Smith, Trevania Turner, Anthony Travis, Jr., La Wanda Travis, and Vera Travis, thank you for your loving support and encouragement when my journey seemed its darkest and endless. As the only sibling to earn a graduate degree, all of you earned it through me. You were there to provide emotional support and

encouragement when I felt drained. You provided babysitting services, tossed money my way when I needed it, and rallied around me when I felt like giving up. Truly, my degrees belong to all of us.

To my sister Trevania Turner, who passed away February 14, 2015. I am sorry that I could not make it across the finish line before you went home. I wish I could have graduated before you left us. You always said, “Landa, that’s all of our degree.” You were determined to be at my graduation standing by my side. No worries, your spirit will be there.

Acknowledgments

To Dr. Marlene Cohen and Dr. Ernest Vasti, I would like to thank you for paving the way for me to complete my journey. Your belief in my ability to achieve this goal, and the energy dispensed to pull me across the finish line will stay with me throughout my career. Your words of wisdom and the behavior you modeled have been incorporated as part of my life. You’ve taught me and modeled that when someone helps you, you, in turn, should help others. I will. I promise. Dr. Cohen, I would like to give special thanks for all that you purposely taught and had no idea you were teaching. You are the most inspirational person I have ever known. I am in awe of your skills. When I grow up, I aspire to be just like you.

To Dr. Richard Cicchetti and Dr. Marlo Walters, thanks for believing in me and my topic, and for your unwavering support, encouragement, and guidance through this

unique experience. To Dr. Hannah Lerman, thanks for your thorough review and suggestions that helped to move the process forward. To Dr. Charles T. Diebold and Dr. Welter McCollum, thanks for being a part of my team and helping me making it across the finish line. I truly appreciate your guidance and support.

Special thanks to Dr. Cicchetti for keeping me motivated and making the journey worth fighting. You never gave up on me, and you kept your promise and stayed with me. Words cannot express the amount of gratitude I feel. My experience with you taught me always to believe in myself, even when it appears there is not another way to move beyond the barriers. You taught me that pushing forward provides a way. Thank you.

Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction to the Study

The Substance Abuse and Mental Health Services Administration (SAMHSA, 2015) reported the use of opioids, hallucinogens, stimulants, cannabis, tobacco, and alcohol causes significant cognitive, behavioral, and social impairments, and negatively affects a person's quality of life. Physiological and psychological dependence on foreign chemicals not naturally produced in the body was the previous definition of substance abuse. In the updated edition of the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (*DSM-V*), terminologies such as substance abuse or dependence were replaced with *substance use* (American Psychiatric Association [APA], 2013). Disruptions in family structure and harmony, legal or health issues, and adverse influence on employment advancements or educational achievements are elements that were identified and diagnosed as an addiction due to substance abuse or dependence (Bao et al., 2009; Caan, 2012; Gifford & Humphreys, 2007; Grant, Potenza, Weinstein, & Gorelick, 2010). Now, according to *DSM-V*, functionality associated with substance use is the major focus of a substance abuse disorder diagnosis, along with the degree of impairment. According to Cann (2012) and Kreek, Nielsen, Butelman, & LaForge (2005), substance use disorders affect not only the individual's quality of life, but that of other citizens on a local, state, and national level. Social service providers have responded to increased needs for shelter and food, along with physical and mental health services based on the inability of individuals with a substance use disorder to sustain themselves in the community without additional resources. Medical professionals have

been confronted with reduced resources based on drug related treatment issues that included injuries, overdoses, and diseases such as Human Immunodeficiency Virus and Acquired Immunodeficiency Syndrome. The overuse of various substances also contributed to emotional, mental, and psychological impairments such as psychosis, depression, and anxiety, which drained scarce resources of mental health providers. Substance users pushed the capacity of the criminal justice system as facilities tried to accommodate drug-related criminals. Most important, the United States suffered from the loss of productive workers, as substance users lack the capacity to perform in employment and educational settings.

The multiple repercussions associated with substance abuse left the public with negative opinions about people with a substance use disorder. The stigma attached to those suffering from substance use disorders contributed to the development of a social movement. The movement included the need to shift public opinion away from negative association related to addiction. Davidson et al. (2008) argued the omission of the word addict from the treatment process would help shift thought processes toward positive interventions such as patient empowerment and patient-centered care. Karim and Chaudhri (2012) and McLachlan and Starkey (2012) suggested redefining the traditional view of people with addiction and providing the most appropriate treatment such as an individualized assessment tool. The Drug-Related Locus of Control (DRLOC) scale is an individualized assessment tool that targets the patient's needs and supports the implementation of patient-centered care (Hall, 2001). By understanding the score

generated by the DRLOC scale, patients could recognize their addictive thought processes in order to control their behavior, thereby minimizing the negative effect addiction has on medical, mental health, legal and family systems, and the stigma associated with substance use disorders.

Despite Davidson et al.'s (2008), Karim's and Chaudhir's (2012), and McLachlan's and Starkey's (2012) efforts to change the negative opinions and social stigma related to people diagnosed with substance use disorders, drug addiction continued to plague the United States and other countries throughout the world and have reached an epidemic level (Baird, 2015; Rollins, 2016; Worley, Heinzerling, Shoptaw, & Ling, 2015). The United Nations Office on Drugs and Crime (UNODC, 2015a), documented an estimated 162 to 324 million people, globally, reported the use of some form of illicit drugs. Mennis, Stahler, and Baron (2012) reported 205 million people worldwide abused drugs during 2012. In the United States, the prevalence of addiction continued to negatively affect the country with 23.9 million Americans who reported the use of illegal drugs between 2008 to 2012 (Cummins, Nadorff, & Kelly, 2009; SAMHSA, 2013a).

In California, each year from 2010 to 2014, approximately 876,000 residents reported the use or abuse of illicit drugs (SAMHSA, 2015). SAMHSA (2013a) reported 947,000 people in California abused illicit drugs in 2012. However, less than 115,000 of the 947,000 people received some form of treatment. The following year, California reported 169,875 admissions into various treatment programs with 136,654 initial

admissions and 33,221 readmissions, indicating individuals often sought treatment multiple times (California Department of Alcohol and Drugs Program [CDADP], 2013). The CDADP (2013) also found Methamphetamine was the most commonly reported primary drug of choice in the state, at a rate 13% higher than heroin.

Substance use disorders involve complex neurological changes. They cause neurobiological reactions at a cellular level where molecules create structural changes and shifts in behavior . Genetics and environmental factors contribute to maladaptive behaviors and impaired thought processes, from the begin stage of drug use, to the escalation of drug abuse, and then finally addiction (CDADP, 2013; Kreek et al., 2005; SAMHSA, 2013a; UNODC, 2015a). The issues involved with substance use disorders warrant the need for ongoing studies from multiple disciplines, including research in the areas of social science, neuroscience, behavioral science, and cognitive science.

The development and use of assessment instruments helped to identify and treat addictive behaviors (Ersche, Turton, Croudace, & Stochl, 2012; Hall, 2001; Neto & True, 2011). Administering assessment instruments directly related to substance abuse and assisted clinicians in determining a patient's readiness toward recovery, which helped guide the practitioner to implement one or multiple evidence-based treatment interventions. Treatment programs that administer the DRLOC assessment instrument during admission, while in treatment, and toward the end of services could be beneficial for measuring treatment success.

In Chapter 1, I provide the background of this study, along with an introduction to the development of the DRLOC scale and the original Internal-External Locus of Control (I-E LOC) instrument. Additionally, I identify the purpose and social significance of conducting the study, along with the methodology, hypotheses, and research questions. I also offer details concerning generalized expectancy theory, which I used for my theoretical foundation. Included in this chapter are the operational definitions of terms, along with the assumptions, limitations, and scope of the study. Finally, I provide the etiology of addiction and the significance and nature of the study, along with a deeper understanding of the social implications related to drug use.

Background of the Study

Addiction is a chronic relapsing disease (Davidson et al., 2008; Gifford & Humphreys, 2007; Grant et al., 2010; Vohs & Baumeister, 2009). There are two types of addiction: Chemical addictions related to foreign chemicals introduced into the body and behavioral or process addictions, developed from patterns of impulsive and compulsive behaviors (Buckland, 2008; Caan, 2012; Grant et al., 2010; Karim & Chaudhri, 2012; Shor & Levit, 2012). Both types of addictions share commonly identified biopsychosocial and behavioral features in the areas of development, maintenance, treatment, and recovery (Grant et al., 2010; Leeman & Potenza, 2013; McLachlan & Starkey, 2012). Addiction is a mental health disorder that presents with very complex behaviors and tends to cooccur with other mental health disorders (Caan, 2012; Carlson & Larkin, 2009; Congdon & Canli, 2008).

Over several decades, substance use increased (UNODC, 2015a; SAMHSA, 2012). The UNODC monitored and annually reported drug activities from around the world. In 2012, 162 to 324 million people used illegal drugs (UNODC, 2015a). This number reflected the increased number of entries into treatment for substance use disorders over the past 10 years. California is one state where the availability of treatment continued to rise (CDADP, 2013).

Ongoing drug use may be the result of personality traits influenced by impulsivity that caused addictive behaviors to develop (Caselles, Mico, & Amigo, 2010; Cyders et al., 2007; Whiteside & Lynam, 2001). People's belief systems also influenced ongoing drug use and are directly related to their ability to obtain abstinence through treatment (Hall, 2001; Rotter, 1966).

There are numerous commonalities across a wide range of substance use disorders that present with similar cognitive, neurological, and physiological symptoms. Substance use disorders also share similar behavioral characteristics in terms of etiology, functionality, and response to treatment interventions (Gifford & Humphreys, 2007; Grant et al., 2010). Individualized instruments that measure specific impulsive behaviors associated with seeking out and obtaining drugs and instruments that measure thought processes related to drug use are tools practitioners have used to help identify triggers (Cyders et al., 2007; Ersche et al., 2012; Hall, 2001; Whiteside & Lynam, 2001). I seek to understand whether the score generated from the DRLOC scale is influenced by gender and narcotic or stimulant (cocaine, crack, amphetamine, or Methamphetamine) abuse.

The stigma of seeing patients as addicts and not associating their addictions with a neurological disease resulted in the need to advocate for social change (Davidson et al., 2008). Davidson et al. (2008) and Larkin, Wood, and Griffiths (2006) encouraged individuals and organizations in the healthcare field to demonstrate a positive shift in the words they chose to use and the way they treated patients with addictions. Davidson et al. (2008) further encouraged practitioners to become more person-centered.

Person-centered regimens focus on patients as individuals, thereby providing customized treatment plans (Rogers, 1992). After the introduction of Rogers' theory of patient-centered care, which allowed for individualized treatment plans and research approaches and consisted of six components, Kirschenbaum and Jourdan (2005) narrowed the six initial elements of patient-centered care down to three main components: Empathy, unconditional positive regard, and positive congruency. Incorporating patient-centered care across mental health and addiction settings could help diminish the stigma associated with substance use disorders (Kirschenbaum & Jourdan, 2005).

For this study, I examined chemical addictions, specifically those related to narcotic and stimulant (cocaine, crack, amphetamine, and Methamphetamine) abuse. The criterion related to these addictions and diagnoses are under the category of substance use disorders in the *DSM-V*. As noted by Caan (2012) and Congdon and Canli (2008), the development of addictive behaviors is complex. Rotter's generalized expectancy theory has been applied in the field of addiction to explain how past positive or negative

experiences determined whether people generalize their current experiences or reinforced them using internal or external beliefs, which placed value on similar experiences in the future. Rotter (1966) theorized that if people expected that similar situations or events would bring about a similar outcome, then impulsive people would respond according to the outcome they expected to occur. How much control people felt they had over similar outcomes determined how they responded (Rotter, 1966). Rotter and Mulry (1965) termed this belief system locus of control.

Locus of control (LOC) has two constructs. The first construct described people who have an internal LOC. People with an internal LOC believe they had some control over the outcome of an event or situation regardless of the positive or negative result. If people believe they had limited or no control over an outcome, then Rotter and Mulry's (1965) second construct labeled them with an external LOC. To measure these two constructs, Rotter and Mulry developed a unidimensional instrument called the Internal-External LOC (I-E LOC) scale. The instrument was widely successful in different psychology and healthcare fields along with the field of employment. The effect generalized expectancy theory had on people's LOC provided a theoretical foundation for examining thought processes associated with ongoing drug use.

Since 1965, researchers adapted, modified, and translated the generalized I-E LOC scale for use in 43 countries and with those who speak different languages. Calicchia (1974) adapted the I-E LOC scale to measure LOC variations based on the use of narcotics. Keyson and Janda (1972) modified the I-E LOC scale to develop the

Drinking Related Internal-External (DRIE) LOC scale to measure LOC in alcoholics. Hall (2001) modified the DRIE instrument by changing the word alcohol to the word drug. Hall (2001) also changed other words associated with the use of alcohol to words associated with drug use to develop the DRLOC scale. The DRLOC instrument and all other LOC instruments developed before and afterward were based on Rotter and Mulry's I-E LOC instrument.

Hall (2001) and Ersche et al. (2012) administered the DRLOC instrument with 500 plus participants that resulted in men's LOC score being external. Hall (2001) questioned the results from studies with a small number of participants that documented most of the women produced an external score and studies with a large number of participants that demonstrated most of the men produced an external score.

The current study adds to Hall's research by examining gender, primary drug use, and their influence on DRLOC scores. The role of LOC and thought processes associated with drug use among men and women provided a conceptual foundation for the current study. Generalized expectancy theory provided a theoretical foundation for the current study and helped to understand why drug use continues.

Problem Statement

The UNODC (2015b) suggested opiates and opioids are the main culprits for most drug related deaths globally. In the United States, there was an increase in heroin usage from 15% in 2004 to 22% in 2014 and opiate abuse from 3% in 2004 to 8% in 2014 (SAMHSA, 2016c). Methamphetamine abuse increased from 6% in 2004 to 9% in 2014

(SAMHSA, 2016c). Methamphetamine is the most commonly used illegal drug in California compared to heroin as a primary drug (CDADP, 2013). In California, there were 48,345 admissions into treatment for Methamphetamine and amphetamine abuse. Cocaine and crack cocaine accounted for 7375 admissions. Treatment for heroin abuse resulted in 38,785 admissions, while opiate abuse had 8,468 admissions (SAMHSA, 2016d).

The focus of this study was to examine the effect gender and primary drug had on DRLOC. I was unable to locate recent research focused on LOC and narcotics, LOC and stimulants, or LOC with narcotic and stimulants.

There were limited numbers of assessment tools used for measuring drug-related disorders and LOC. The original I-E LOC scale measured individuals' belief in whether they could control their consumption of alcohol and did not focus on drug abuse (Rotter & Mulry, 1965). Calicchia (1974) used the I-E LOC scale to measure LOC and heroin usage. Hall (2001) developed the DRLOC scale to focus specifically on drug abuse among people in treatment programs. Ersche et al. (2012) studied the reliability of the DRLOC scale and reported the DRLOC scale to be an effective assessment tool for measuring LOC in people with substance use disorders. Their study measured LOC in a large sample of 592 participants with a history of alcohol and drug abuse. Past studies that used a generalized LOC instrument provided small sample sizes of less than 100 participants and often less than 50 participants (Hall, 2001). I used Hall's data generated from 553 participants to identify a subset of 402 participants; 117 identified narcotics as

their primary drug and 285 identified stimulants (cocaine, crack, amphetamine, or methamphetamine) as their primary drug. Once I identified the target sample, I examined their DRLOC scores to determine group mean differences by primary drug (narcotics vs. stimulants) and gender (male vs. female).

Purpose of the Study

The current study is a pre-experimental, quantitative study utilizing secondary data from a study conducted by Hall (2001) titled, *Feelings About Drug Use, Drug-Related Locus of Control*, which, itself, was a follow-up to the University California Los Angeles' (UCLAs) Integrated Substance Abuse Programs' study titled, Drug Treatment Process and Drug Treatment Counselor Practices and Effectiveness study. The purpose of conducting this secondary analysis was to reexamine data regarding individuals who received treatment for their substance use disorders. Specifically, I examined the main factorial effects of primary drug (narcotic vs. stimulant), gender (men vs. women), and their interaction on DRLOC. In Chapter 2, I provide an in-depth discussion of the literature about the DRLOC instrument and its relationship to narcotic and stimulant disorders.

Research Questions and Hypotheses

The dependent variable is DRLOC, in which a low score indicated an internal LOC and a high score indicated an external LOC. Chapter 3 includes an in-depth description of the instrument. The independent variables are primary drug (narcotic or stimulant) and gender (male or female). Of primary interest was the effect of the primary

drug on DRLOC score, but because Hall (2001) found males had statistically significant higher DRLOC score than females, it was important to control for gender and examine any interaction effect between gender and primary drug.

Coffey, Schumacher, Baschnagel, Hawk, and Holloman (2011) reported addictions contribute to maladaptive behaviors based on the lack of impulse control. The Drug Enforcement Administration (DEA, 2013), found a relationship between both narcotic and stimulant disorders and compulsive and impulsive behaviors. Bornovalova, Daughters, Hernandez, Richards, and Lejuez (2005) found people who used stimulants had a higher propensity for risky behavior and impulsivity than people who abused heroin. Furthermore, McAnena, Craissati, and Southgate (2016) suggested there is a high correlation between maladaptive behaviors, impulsivity, and external LOC. Although these findings suggested patients with substance use disorders who choose stimulants as their primary drug would produce an external LOC score based on impulsivity and a perceived lack of control over their maladaptive behaviors. All hypotheses for the proposed secondary analysis are nondirectional in order to afford an unbiased assessment of the data. To simplify the hypotheses that follow, the test of a specific effect assumes statistical control for the other effects.

RQ1: To what extent do DRLOC scores differ by primary drug (narcotic vs. stimulant), gender (male vs. female), and their interaction?

$N_0 1$: There is no statistically significant difference ($p > .05$) in DRLOC scores between participants whose primary drug was a narcotic versus a stimulant.

N_a1: There is a statistically significant difference ($p < .05$) in DRLOC scores between participants whose primary drug was a narcotic versus a stimulant.

N_02: There is no statistically significant difference ($p > .05$) in DRLOC scores between males and females.

N_a2: There is a statistically significant difference ($p < .05$) in DRLOC scores between males and females.

N_03: There is no statistically significant interaction effect ($p > .05$) between primary drug and gender on DRLOC scores.

N_a3: There is a statistically significant interaction effect ($p < .05$) between primary drug and gender on DRLOC scores.

Theoretical Foundation

Rotter (1966) introduced the generalized expectancy theory as a social learning theory addressing impulsive reactions supported by cognitive and behavioral responses to environmental stimuli. Generalized expectancy theory helped to explain the behavior of patients diagnosed with substance use disorders and their inability to control addictive behaviors associated with ongoing drug use. Rotter explained that the nature of impulse response is related to a current situation that is similar to prior experiences. Patients generalize the outcomes related to past drug-related experiences and used them to reinforce their behavior with similar drug-related experiences in the future, thereby establishing preconceived expectations. More details about generalized expectancy theory are provided in Chapter 2.

Addictive disorders involve behaviors related to impulsive and compulsive actions, including the inability to self-regulate or control behaviors (Sheffer et al., 2012; Webb, Sniehotta, & Michie, 2010). Due to the construct lack of control as related to substance use disorders, Rotter's generalized expectancy theory provided a comprehensive explanation and the theoretical basis for understanding what drives ongoing addictive behaviors.

Conceptual Framework

Cognitive awareness of control is relevant to the assessment of ongoing substance use. Examining LOC was appropriate for measuring patients' expectations regarding how much control they had or thought they had over their drug use based on prior experiences with drug-related activities (Sheffer et al., 2012; Webb et al., 2010). Internal LOC is defined as people's ability to understand their role in a given situation and acceptance of the level of control they had in the outcome (Rotter & Mulry, 1965). People believing they had little control over a given outcome due to luck, faith, or another factor outside their control met the definition of external LOC (Rotter & Mulry, 1965).

By applying the constructs of LOC, researchers could identify a person who believed he or she had a certain amount of control over their drug use compared to a person who believed there were other factors in the environment causing him or her to continue drug use. Examining LOC, coupled with generalized expectancy theory as applied to addiction, could help to identify patients' expectations about what might occur due to prior positive or negative experiences with similar situations or events.

Generalized expectancy theory and LOC could help practitioners determine a reason for ongoing drug use or sustained abstinence.

The use of the DRLOC scale at the beginning, during, and at the end of treatment could help measure shifts in thought processes, behaviors, and quality of life (Pasareanu, Opsal, Vederhus, Kristensen, & Clausen, 2015). Men and women who used narcotics or stimulants as their primary drug could benefit from learning their DRLOC score.

Nature of the Study

The current study is a preexperimental static group comparison. The DRLOC instrument measures thought processes associated with drug use. I extracted from the 553 participants in Hall's study a subset of 402 participants to conduct secondary analysis of data from participants who completed the DRLOC instrument and identified a narcotic or stimulant as their primary drug. The purpose for identifying narcotics and stimulants was they were the most abused drugs in the United States (SAMHSA, 2016c), and has been identified as the most abused drugs upon admission into treatment programs in California (CDADP, 2013; SAMHSA, 2016d).

I obtained permission from Hall and representatives at the UCLAs Integrated Substance Abuse Programs to use the data generated from the DRLOC study (see Appendix A). For this study, the dependent variable was DRLOC score, in which a score of one indicated an internal LOC and a score of two indicated an external LOC. The independent variables were primary drug (narcotic or stimulant) and gender (male or female). The primary analysis was a 2x2 full factorial ANOVA. To describe the sample,

age, race, socioeconomic status, and education level were reported. If any of these demographic variables are found to be related to the DRLOC score, they were included as a covariate in the primary analysis. Operationalization of all variables is detailed in Chapter 3.

Definition of Terms

The following clarifies and defines the words used in the study.

Addiction: Addiction is a brain disorder or neurological disease caused by molecular changes in the brain when foreign chemicals are introduced into the body's system (APA, 2013).

Addictive Behaviors: Addictive behaviors consists of impulsive and compulsive actions and reactions associated with drug use due to peoples' inability to self-regulate or control their impulses when faced with internal and external stimuli (Rotter, 1966; Sheffer et al., 2012; Webb et al., 2010). These biopsychosocial patterns of addictive behaviors include ongoing substance use or impulsive and compulsive patterns of maladaptive behaviors despite disruptions to the family system, social relationships, educational achievement, and employment obligation.

Dopaminergic System, Serotonergic System, Mesocorticolimbic System, and Endogenous Opioid Systems: These systems are different areas of the brain that produce neurotransmitters to communicate from one region of the brain to another. These systems are part of the reward circuitry responsible for reinforcing and maintaining addictive

behaviors (Karim & Chaudhri, 2012; Leeman & Potenza, 2013; Neto & True, 2011; Niehaus et al., 2009).

Generalized Expectancy Theory: A person develops expectations for a present situation by comparing similar events or outcomes that occurred in the past. It is during past experiences that patterns of behaviors and anticipation determine how one would respond to similar experience in the future (Rotter, 1966).

Locus of Control: Locus of control is a person's ability to believe he or she had some control or no control over the outcome of a situation or event (Rotter & Mulry, 1965).

Narcotics: Narcotics consists of opium, morphine, hydromorphone, codeine, oxycodone, hydrocodone, tramadol, buprenorphine, methadone, meperidine, pentazocine, propoxyphene, and any other drug with morphine-like effects (SAMHSA, 2016c).

Primary Drug: The primary drug is a person's preference for a particular drug (SAMHSA, 2016c).

Stimulants: Stimulants consists of amphetamines, Methamphetamines, cocaine, and crack cocaine (SAMHSA, 2016c).

Substance Use Disorder: Substance use disorders are neurological diseases defined as physiological and psychological dependence on foreign chemicals introduced into the body (Buckland, 2008; Caan, 2012; Carlson & Larkin, 2009; Congdon & Canli, 2008; Davidson et al., 2008; Shor & Levit, 2012). The dependence on these foreign chemicals interferes with a person's ability to function socially, causing significant

biopsychosocial impairment and maladaptive behaviors that negatively impact the person's quality of life (Buckland, 2008; Caan, 2012; Carlson & Larkin, 2009; Congdon & Canli, 2008; Davidson et al., 2008; Shor & Levit, 2012).

Assumptions

I used secondary data generated from UCLAs Integrated Substance Abuse Programs that conducted two studies with the same population. The original study was the Drug Treatment Process and Drug Treatment Counselor Practices and Effectiveness (Hall, 2001). From this population, a second study was conducted by Hall (2001), the Feelings About Drug Use, Drug Related Locus of Control (DRLOC). UCLAs Integrated Substance Abuse Programs recruited participants from 19 treatment programs within Los Angeles country representing five treatment modalities: inpatient programs, outpatient programs, residential programs, day programs, and methadone maintenance treatment programs (Hall, 2001).

Davis, Doherty, and Moser (2014) indicated the need to present oneself in a favorable way to make a positive impression or to exaggerate responses to feel socially acceptable are all concerns when administering self-report instruments like the DRLOC scale. I assumed all participants in the original UCLAs Integrated Substance Abuse Programs' study and Hall's Feelings About Drug Use, DRLOC study were truthful with their responses to questions on the DRLOC scale. I also assumed the programs under the UCLAs Integrated Substance Abuse Programs did not coerce participants to be involved in one or both studies or made them feel obligated to participate. It is noteworthy, some

participants from the original UCLAs Integrated Substance Abuse Programs' study declined to participate in the Feelings About Drug Use, DRLOC study (Hall, 2001).

Scope and Delimitations

The current study used secondary data generated from the Drug Treatment Process and Drug Treatment Counselor Practices and Effectiveness study and the Feelings About Drug Use, DRLOC study conducted by the UCLAs Integrated Substance Abuse Programs (Hall, 2001). These studies represented a sample of 19 different programs from five different treatment modalities whose participants were tested for 10 identified abused drugs. The Drug Treatment Process and Drug Treatment Counselor Practices and Effectiveness study included 666 participants. The Feelings About Drug Use, DRLOC study included 553 participants. I used data from the Feelings About Drug Use, DRLOC study to examine DRLOC scores of 553 participants (men and women). I identify a subset of 402 participants who indicated either a narcotic or stimulant as their primary drug. My focus was to determine if primary drug used among men versus women effect the DRLOC score.

Generalized outcomes associated with prior addictive behaviors could influence the patient's belief system, which may be directly related to the primary drug. This could imply a connection between cause and effect. I only seek to explore an association between the three variables (gender, primary drug, and LOC score) but not whether a cause and effect relationship exists. Any appearance of a cause and effect association is coincidental.

Limitations

Hall's (2001) Feelings About Drug Use, DRLOC study provided an overview of the methodology, procedure, and instruments administered during the UCLAs Integrated Substance Abuse Programs' study, titled Drug Treatment Process and Drug Treatment Counselor Practices and Effectiveness. However, detailed procedures on how the instruments were administered were not provided. I limited my investigation to the information provided by Hall's 2001 report on the Feelings About Drug Use, DRLOC study, which used the original data generated by UCLAs Integrated Substance Abuse Programs' study.

Limitations involving participants' reading and writing abilities were a concern. SAMHSA (2012) indicated 64.1% of people with an addiction finished high school. I was not able to locate information indicating the comprehension level of the DRLOC scale or the I-E LOC scale. Rotter's I-E LOC study recruited college students. In Hall's study, there were no indications whether interviewers read to participants and then completed the instrument by marking the answers provided, or if each participant independently completed the surveys and questionnaires provided to them by the interviewers. Hall's (2001) report did indicate the education level of those who participated in the UCLAs Integrated Substance Abuse Programs' study averaged 12.2 years.

Threats to internal validity were also a major concern. People with addictive behaviors often demonstrated a lack of responsibility, such as not keeping appointments

or not following through with completing studies. Hall (2001) documented there were 666 participants in the UCLAs study, of which 565 participated in the DRLOC study and 101 participants declined. Hall's report also indicated there were participants who did not complete all 15 items on the DRLOC scale. Hall did not note the reasons why those who participated in the study did not complete all 15 items. Hall did not document the exact number of incomplete instruments. Hall did include instruments with at least 12 of 15 items completed in the final analysis.

There might be a potential threat to internal validity as participants are patients in programs directly affiliated with UCLAs Integrated Substance Abuse Programs. The phenomenon of patients giving socially appropriate responses compared to honest responses representative of their addictive behaviors, counseling experience, and thought processes could affect internal validity. Therefore, potential information bias could have been present. It is not clear from Hall's (2001) report if participants of the UCLAs Integrated Substance Abuse Programs' study were required to respond due to their affiliation with the UCLAs Integrated Substance Abuse Programs. However, what is clear from Hall's (2001) report is there were participants who declined to participate in the follow-up study, Feelings About Drug Use, DRLOC.

Extraneous and confounding variables from biopsychosocial triggers in the environment are other issues of concern regarding threats to internal validity. These variables could have influenced behaviors and thought processes and thereby effected responses to questions given in the UCLAs Integrated Substance Abuse Programs' study

and Hall's DRLOC study. An example of an extraneous variable could have been participants under the influence of drugs while completing the DRLOC instrument.

Significance of the Study

Addiction is a multidimensional disease with complex habitual behaviors (Caan, 2012; Carlson & Larkin, 2009). Researchers determined all types of addictions are similar in their etiology, functionality, physiological and psychological withdrawal processes, and neurobiological effects at a cellular level (Gifford & Humphreys, 2007; Grant et al., 2010; Heidbreder, 2008; Niehaus et al., 2009). Furthermore, addiction impacts behavior (Gifford & Humphreys, 2007; Heidbreder, 2008; Niehaus et al., 2009) and stages of recovery (DiClemente, 2003; Norcross et al., 2011). By understanding the thought processes of people with an addiction clinician could better address addictive behaviors with appropriate evidenced based interventions.

The focus of this study was threefold: to examine if narcotic or stimulant used among men and women effect the DRLOC score, to address Hall's (2001) question related to gender and external LOC score, and to enhance the body of work that Hall (2001) and Ersche et al. (2012) presented by determining if there is usefulness in implementing the DRLOC scale as an individualized instrument to be included in the treatment process. Implementing the DRLOC instrument at the time of admission, during treatment, and toward the end of treatment (Pasareanu et al., 2015) could potentially help measure patient's progress in treatment through personal awareness and shifts in thought processes and behaviors, or the lack thereof. The DRLOC scale could provide a

reasonable understanding of the minimal progress achieved and it could help determine the appropriate interventions needed that coincide with the patient's LOC score.

The results of this study could have significant social change implications for the addiction, medical, and mental health fields due to a potential increase in understanding the interdependency of I-E LOC and primary drug used by patients receiving treatment for substance use disorders. This approach supports the need for practitioners and patients to work together to develop interventions throughout treatment as they address addictive behaviors. By understanding the LOC score, practitioners and patients alike could recognize addictive behaviors better and make decisions regarding intervention strategies. Implementing the DRLOC scale as an integral part of treatment seemed to be a natural next step in the field of addiction to assess how people view their control, or lack thereof, over addictive behaviors.

Social Change Implications

When addressing addiction as a social problem, it is important to understand the disorder as a multifaceted disease that effects not only the individual but loved ones and the broader society. The social implication of utilizing the DRLOC instrument in treatment programs and educating patients about their DRLOC score could help patients become aware of their LOC and gain an understanding of how their ongoing drug use was connected to how they viewed a situation and prior experiences and what might have been their triggers. This awareness could help patients recognize and avoid

places, people, and things that contribute to relapses, thereby helping patients shift from using drugs toward gaining and maintaining abstinence.

Foon (1986) suggested practitioners administer a LOC instrument as part of family therapy with each family member. Foon asserted a better understanding of a loved one's addictive behaviors and level of control toward drug use exists when each family member is aware of their own LOC score and how this impacts their interactions with others. Being aware of one's LOC score may help family members change their perception and the stigma associated with addictions (Foon, 1986).

Addiction is seen as a socially pejorative term with stigmatizing connotations, such as drug addict and dope fiend (Davidson et al., 2008). Social implications from the general public becoming educated about LOC and one's personal score could help the public recognize their thought processes associated with daily responses to events and situations. This awareness could result in positive shifts in how the public view and treat people with a substance use disorder (Davidson et al., 2008; Karim & Chaudhri, 2012; McLachlan & Starkey, 2012).

Sigma that exists in the medical and mental health fields was addressed by Davidson et al. (2008), as well as Larkin et al. (2006). They suggested encouraging professionals in the medical and mental health fields to start addressing patients as individuals who are experiencing an addiction and not to focus exclusively on the addiction controlling the individual. For example, Davidson et al. (2008) suggested saying *people with an addiction* instead of saying *heroin addicts* as more appropriate

language. The social implication of using person-first allowed for an understanding of the disorder as a disease instead of a disorder out of one's control (Davidson et al., 2008).

Social implications for treatment programs that administer the DRLOC scale could be beneficial for measuring treatment success. Obtaining the DRLOC score during the initial admission could help with selecting appropriate treatment interventions at the beginning of treatment. When administering the DRLOC scale halfway through treatment, the score could help practitioners and patients better recognize the thought processes behind addictive behaviors and how to control them. The score could then help to determine if adjusting interventions during the treatment process is needed. When administering the DRLOC scale toward the end of services, the score could help to measure progress or lack thereof and provide an informed discharge plan (Connolly, 1980).

Foon (1986) concur with using an individualized assessment instrument such as the DRLOC scale as a pre and post-assessment tool to help the practitioner gauge the thought processes of the patient. By obtaining the patient's LOC score, practitioners and other professionals in addiction, medical, and mental health settings could better understand the psychological dependence that drives ongoing drug use at an individualized level (Foon 1986). Furthermore, by understanding the thought processes of patients, practitioners could develop treatment interventions based on where patients are in their thought processes, either internally or externally (Foon, 1986).

According to Rotter and Mulry (1965), patients with an internal LOC score would more likely attend treatment programs regularly, work at strengthening coping skills, have a willingness to learn more about their addiction and addictive behaviors, would remember information that helped them in their recovery, and would work harder at setting and achieving goals. Rotter and Mulry (1965) further explained patients with an external LOC score would take longer to work on cognitive and behavioral skills as they learn to accept responsibility for addictive behaviors.

A more progressive practice, according to Foon (1986), is to administer a LOC instrument for practitioners as well as patients. Utilizing a LOC instrument for both professionals and patients would help to minimize stigma in treatment settings (Foon, 1986). For example, making practitioners aware of their external LOC would help them work on shifting their thought processes toward an internal LOC, or matching an internal thinking professional with an internal thinking patient could increase favorable results (Ersche et al., 2012).

Social implications for clinicians in multiple human service fields and community organizations could benefit by knowing the DRLOC score that could then be aligned with appropriate evidence-based interventions (National Registry of Evidence-based Programs and Practices, 2016). Implementing these interventions could help shift negative behaviors toward positive behaviors, thereby reducing the human cost associated with substance use, medical care, mental health treatment, family services, and legal issues (Caan, 2012; Kreek et al., 2005). For example, the National Institute on Drug Abuse

[NIDA] (2014) reported how maintaining a sober life could assist with establishing stability, thereby potentially decreasing incidents of domestic violence and other criminal activity, along with increasing productivity in the workplace. Retention in treatment could positively influence personal health and safety associated with accidents, unintentional overdoses, and premature deaths (Kreek et al., 2005; NIDA, 2014). According to Hatgis, Friedmann, and Wiener (2008), college students who used drugs had lower grades, were less likely to participate in extracurricular activities, sought mental health services, and were more sexually active than students who did not use drugs.

In 2014, NIDA published a report indicating family members spent billions of dollars to have loved ones treated by doctors, teachers, social workers, counselors, and volunteers who worked in the field of addictions, medical, mental health, and in community organizations. By finding innovative ways to address substance use disorders and developing appropriate interventions to treat patients, the United States could generate a savings of up to 12 times the costs of not providing individualized treatment (NIDA, 2014). Stanforth, Kostiuk, and Garriott (2016), suggested the implementation of a LOC scale could help guide appropriate treatment interventions that deter addictive behaviors and cause positive social change to monetary costs of health care, legal, and educational institutions.

In conclusion, the results of this study could have positive social change implications for the patient, family members, the general public, practitioners in

treatment programs, and clinicians in health care fields. Including the DRLOC scale as part of a practice of integrating evidence-based treatment with empirical assessments could help identify internal and external thought processes associated with addictive behaviors and substance use disorders.

Summary

Addiction is a chronic relapsing disease that could develop into a substance use disorder that causes significant cognitive, behavioral, and social impairment and negatively effects a person's quality of life (SAMHSA, n.d.). These negative effects are responsible for social stigma related to substance use disorders (Davidson et al., 2008). A social movement to shift public opinions away from a negative view of addiction toward a positive view of people with substance use disorders was supported by Davidson et al. (2008), Karim and Chaudhir (2012), and McLachlan and Starkey (2012).

Over the years, substance use disorders reached an epidemic level (Baird, 2015; Rollins, 2016; Worley et al., 2015). UNODC (2015a) estimated that globally162 to 324 million people in 2012 used illicit drugs. In the United States, between 2008 and 2012, 23.9 million Americans reported using illegal drugs (Cummins et al., 2009; SAMHSA, 2013a). In 2012, California reported 947,000 people abused illicit drugs, but only 115,000 received treatment. California had the highest number of treatment programs in the United States during 2011 to 2012 (CDADP, 2013). Methamphetamine was the most commonly reported drug as the primary drug at the rate of 13% higher than heroin (CDADP, 2013).

Caan (2012) and Congdon and Canli (2008) noted the development of addictive behaviors is complex. Rotter (1966) used generalized expectancy theory to explain the positive and negative experiences that determined whether people would generalize their current experience or reinforce them using an internal or external belief system. Rotter (1966) reported impulsive people would respond according to the outcome they expect to occur, while others would respond feeling they had no control over the outcome. Rotter and Mulry (1965) termed this belief system LOC and created the I-E LOC scale to measure internal and external LOC.

The purpose of conducting a pre-experimental quantitative study was to explore the effect gender and primary drug use had on DRLOC score. Hall (2001) developed the DRLOC scale to measure LOC in people with substance use disorders. Chapter 2 provides more details about the potential relationship between LOC as an underlying force that might be driving addictive behaviors in people with substance use disorders. Scores from the DRLOC scale of men and women identified as abusing narcotics or stimulants as their primary drug were the targeted population for this study. In Chapter 3, I review my methodological choices, as well as procedures I used to collect and analyze the data.

Chapter 2: Literature Review

There are many ways to approach treatment of a substance use disorder in the addiction, medical, and mental health fields. Pasareanu et al. (2015) stressed the importance of using pre and post assessments as an integral part of measuring treatment interventions and success. Hall's DRLOC scale is a useful tool as an integral part of the treatment process, and as a pre and post assessment instrument for measuring patient's cognitive awareness of drug-related behaviors and shifts in thought processes.

The purpose of conducting a preexperimental quantitative study was to explore the effect gender and primary drug use had on DRLOC scores. My study used data from the UCLAs Integrated Substance Abuse Programs' Drug Treatment Process and Drug Treatment Counselor Practices and Effectiveness and the Feelings About Drug Use, to measure (LOC) by examining the DRLOC score of participants who identified narcotics or stimulants as their primary drug. The DRLOC scale is an assessment instrument used to measure LOC in people diagnosed with a substance use disorder. In this chapter, I provided an in-depth literature review of various related topics, including an explanation of the theoretical foundation and conceptual framework that provides a firm basis for the study. I also included the use of the DRLOC scale as a pre and post assessment tool and the development of the DRLOC instrument.

Literature Search Strategy

A search using addiction related terms and phrases to conduct a literature review required the use of Walden University's library to access the following databases:

PsycINFO, PsycARTICLES, Mental Measurements Yearbook, Health and Psychosocial Instruments, SocINDEX, Google Scholar, and ERIC. Other resources included domestic and international organizations, such as the APA, NIDA, National Institute of Neurological Disorders and Stroke, National Registry of Evidence-Based Programs and Practice, and the UNODC. I downloaded the latest SPSS Version 23 for Windows from Walden University's Library to perform statistical analysis of the variables.

The key search words, terms, and authors consisted of the following: *Whiteside and Impulsivity*, *Cyders and Impulsivity*, *Lynam and Impulsivity*, *Rotter and Locus of control*, *Lefcourt and locus of control*, *and Hall and locus of control*. The following word search included *addiction*, *addictive behaviors*, *behavioral addictions*, *chemical dependency*, *substance abuse*, *stimulants*, *cocaine*, *Methamphetamine*, *narcotics*, *heroin*, and *methadone.* Some key phrases that were searched to provide information about the topics included *stimulant addiction*, *cocaine addiction*, *Methamphetamine addiction*, *opiate dependence*, *prescription abuse and addiction,* and *addiction and theories.* Other word searches and phrases included models of treatment for addictions such as *alternative treatment and methadone*, *models of treatment for recovery*, *treatment programs and theories*, *interventions for addiction treatment*, and *evidence-based practices*. Word searches and phrases also included *stages of development*, *dropout rate and treatment*, *addiction and retention*, *addiction and attrition*, *treatment outcome*, *cognitive behavioral therapy*, *mindfulness, self-help programs*, *neurological disorders and substance abuse*, *substance use and mental disorders*, *reward and addiction*, *genetics*

and addiction, *addiction and brain*, *addiction and dopamine*, *addiction and serotonin*, *addiction and opioid receptor*, *contingency and substance abuse*, *impulsivity and locus of control*, *substance abuse and expectancy*, *addiction and locus of control*, *self-control and addiction*, *free will and addiction*, *locus of control and free will*, *external control and addictions*, *internal control and addiction*, *mental health and addiction*, *co-occurring disorders and addiction*, *social change and addiction*, *coping skills and addictions*, *recovery and addiction*, *men and women and drug use*, *men and women and substance abuse*, *gender and substance use disorders*, *gender and substance abuse*, *gender and drugs*, *gender and mental health*, *gender and medical*, *gender and physical health*, *gender*, *substance abuse, and mental health*, and *gender, substance abuse, and medical*. The scope of the literature search covered the etiology of addiction, addictive behaviors, and treatment for substance use disorders. I also reviewed theories and concepts related to locus of control constructs and generalized expectancy theory and the influence that generalized expectancy theory and locus of control have on men and women with substance use disorders.

Theoretical Foundation

Generalized expectancy theory is a social learning theory combining aspects of reinforcement and cognitive theories to explore the complex nature of human behaviors. The theory provided a basis for comparing cognitive and behavioral responses to environmental stimuli (Rotter, 1966). Rotter (1966) suggested generalized expectancy theory determined how much experience people had in their environment with similar

results, and whether these previous experiences positively or negatively reinforced a belief system which placed value on an anticipated outcome. The theory provided a theoretical foundation for examining the constructs of LOC as related to addiction.

Generalized expectancy theory consists of three elements. The first element is similarity reinforcement and situational reinforcement. Similarity reinforcement happens when parallel experiences occur which yield the same outcomes (Rotter, 1966). When referring to a person with substance use disorders, not only is the stimulus (drug of choice) available as reinforcement, so is the behavioral response (drug seeking). Thus, the experience of using the drug creates a level of expectancy with each similar experience of obtaining the primary drug. For example, a person may travel across town to an area to seek out a drug dealer and buy heroin. In the past, each time the person performed this behavior, he or she was successful in accomplishing the goal of finding a dealer, buying the drug, and then using it. One day the person meets a different dealer selling the drug, or the person might have to visit a different corner to find a dealer. Regardless of how the person obtain the drug, the experience is likely to be similar enough to result in the same outcome of obtaining the primary drug, thereby reinforcing the behavior of seeking out the drug in the future.

Situational reinforcement develops from a set of conditions that vary and require decision-making or problem-solving each time it happens. With situational reinforcement, not only does the stimulus work as a reinforcer, but it initiates a behavioral response (Rotter, 1975). When a person refrains from drug use and accepts

abstinence as a developing skill, the person will initiate problem-solving when he or she begins to desire using a primary drug. For example, when unexpectedly confronted with the opportunity to share heroin with friends, the person would start to process or problem solve about the consequences of submitting to drug use. The person may consider the ramifications of using the drug, which could include starting to use regularly. This could lead to an increase and frequency of drug use over time.

The second element of Rotter's (1975) generalized expectancy theory is the value of the reinforcement. For example, a person traveling across town to a specific house to buy Methamphetamine would expect the drug dealer to be there. Because the dealer had always been there in the past, the drug dealer's presence at the house and being able to buy Methamphetamine to relieve withdrawal symptoms holds a greater value to the person than not traveling across town to buy Methamphetamine, and thus, suffering withdrawal symptoms. Each time the person relieve symptoms of withdrawal, Methamphetamine becomes more valuable or more rewarding than not seeking it. The reward serves to reinforce the continued drug-seeking behavior (Rotter, 1975; Skinner, 1976; Watson, 1970).

The final element of Rotter's (1966) generalized expectancy theory is the psychological situation that has an impact on expectancies and reinforcement values. In other words, psychologically, a person's LOC intervenes and influences his or her belief in the ability to control outcomes. Given the elements of generalized expectancy theory, one could predict that during treatment patients with addictive behaviors would start to

refrain from drug use by avoiding triggers once they are able to recognize the role of generalized expectancy and LOC.

Review of the Literature

In the United States, the identifiable label for a person who experiences chronic relapses is an addict, implying addiction is the primary focus and the individual is secondary (Davidson et al., 2008). What identifies a person as being an addict, or a person with an addiction, is compulsive drug-seeking and impulsive drug-related behaviors and ongoing drug use despite negative biopsychosocial consequence (Niehaus et al., 2009). Schmitz (2005) found the use of the word addiction in the public domain describes a person's overuse or misuse of some item or food, or an obsession with a person or a thing, thereby devaluing the scientific definition of addiction. Schmitz (2005) further indicated that professionals in the field used the term addiction to address substance abuse and substance dependence as presented in the Diagnostic and Statistical Manual of Mental Disorders IV, Text Revision (APA, 2000). However, this did not address the growing understanding of the role neuro-circuitry had in the development of addictions. Therefore, to avoid the misuse of the term addiction by non-professionals in the public domain, and to assure that professionals across disciplines shared the same understanding of what is an addiction, the Diagnostic and Statistical Manual of Mental Disorders IV, Text Revision, did not include a category titled addiction (APA, 2000; Schmitz, 2005).

In presenting a universal definition to guide all professionals, the Diagnostic and Statistical Manual of Mental Disorders IV, Text Revision, provided a more specific definition that identified addiction as being a dependence on, the abuse of, and withdrawal from a foreign chemical not naturally produced in the body (APA, 2000; Schmitz, 2005). To establish global consistency about what is an addiction, in 1969, the World Health Organization discontinued the use of the word addiction and replaced it with the term drug dependence to capture the physiological and psychological state of dependence developed from the abuse of substances (Lubman, Yucel, & Pantelis, 2004). Additionally, in 2011, the American Society of Addiction Medicine presented a definition of addiction reinforcing it as being a brain disease based on the body of research focused on neurobiological aspects (Cann, 2012).

Researchers agreed addiction is more than just the use of a substance; they defined it as a pattern of maladaptive behaviors (Grant et al., 2010). It is now widely accepted that there are two categories of addictions: Chemical addictions relate to foreign substances introduced into the body causing neurological changes at a molecular level (Buckland, 2008; Caan, 2012; Shor & Levit, 2012), and the process of behavioral addictions that are developed from patterns of impulsive and compulsive behaviors (Grant et al., 2010; Karim & Chaudhri, 2012). Both types of addictions share commonly identified biopsychosocial and behavioral features in the areas of development, maintenance, treatment, and recovery (Grant et al., 2010; Leeman & Potenza, 2013; McLachlan & Starkey, 2012).

The Diagnostic and Statistical Manual of Mental Disorders 5 (APA, 2013) reflected the acceptance of behavioral addictions as a serious disorder and added it as a category, Non-Substance Related Disorders, along with Substance-Related Disorders, for chemical addictions. An example of a behavioral addiction is compulsive shopping. A report by Karim and Chaudhri (2012) examined compulsive shopping among men and women. The results revealed no significant difference in behaviors with men at 5.5% and women at 6.0% and implied the disparity between gender and behavioral addictions might be small.

The definition of addiction provided in the Diagnostic and Statistical Manual of Mental Disorders 5 is, "a foreign chemical being introduced into the body causing acute or chronic neurobiological changes that develop into neurological dependence, physiological reactions from the exposure of foreign chemicals introduced into the body's system, chronic relapses resulting from attempts to stop using foreign chemical, psychological symptoms affecting shifts in thought processes, and behavioral problems that negatively impacts the person's quality of life" (APA, 2013, p.585). These changes in the body are responsible for addictive behaviors, which include patterns of obsessive drug seeking, continued impulsive drug use, and repeated relapses (Bao et al., 2009). A level of dysfunction occurs when people lose control over their ability to act and think rationally regardless of consequences to their health, family and social interactions, and productivity with educational and vocational endeavors (Bao et al., 2009; Gifford & Humphreys, 2007; Grant et al., 2010). There were 25 million people in the United States

who used a chemical substance and were susceptible to developing a substance use disorder (Baird, 2015).

Researchers in the field of addiction recommended using the scientific approach to address substance use disorders by focusing on behavioral issues influenced by compulsive patterns of behaviors (Gifford & Humphreys, 2007; Karim & Chaudhri, 2012; Norcross et al., 2011) while others examined environmental and genetic factors (Kreek et al., 2005; Lubman et al., 2004). Separately, other researchers embraced a neurobiological model to explain addiction (Erickson & White, 2009; Leeman & Potenza, 2013).

Despite advancements in the field of addiction, the stigma associated with addiction carries a negative social label. This social attitude creates barriers for many who suffer from substance use disorders that hinder them from seeking formal or informal treatment (Kulesza et al., 2016). Gender discrimination associated with addiction also holds a stigma, but racism, sexism, and other status characteristics that historically marginalized people also contribute to barriers when treating people with a substance use disorder (Kulesza et al., 2016).

The United States tend to see substance use disorders as the result of illegal drug use, but not all substance use disorders start from illegal drug use. Legal drugs, such as alcohol, nicotine, prescription narcotics, and prescription stimulants could develop into a dependence resulting in addictive behaviors, and then addictive disorders (Davidson et al., 2008). Davidson et al. (2008) discussed how the stigma surrounding addiction is an

image of shady characters with no impulse control who steal from family and friends, use dirty needles, and hide in darkness. Davidson et al. also included homeless people who cannot not seem to function properly in society. Rarely does the stigma related to addiction take into account certain segments of society, which do not fit into the category of an addict, such as people living in high socioeconomic areas or those who hold positions of authority and respect in organizations and institutions (Davidson et al., 2008).

For example, the younger population might develop an addiction to substances stemming from peer pressure (NIDA, 2014). This population includes middle school, high school, and college students attending weekly parties consuming alcohol, narcotic and stimulant pills (NIDA, 2014). Davidson et al. (2008) suggested not only are younger people susceptible to potential dependence and addiction but also the elderly, relatives, or people we trust, such as police officers, nurses, and teachers, even grandparents. Their struggles begin when they develope a dependence on prescription narcotics in the aftermath of recovering from a serious surgery. As the population in the United States ages, we will face an increase of substance use disorders among patients 60 years and older with limited treatment programs equipped to address their concerns (Davidson et al., 2008); approximately 5.4% of elderly patients used illegal drugs (Morgen, Denison-Vesel, Kobylarz, &Voelkner, 2015). SAMHSA (2016c) reported the oldest person in treatment for narcotic abuse was 68.8 years old and the oldest person in treatment for stimulant abuse was 78.1 years old. Given the right conditions and circumstances, we are

all susceptible to developing a dependence on prescription medication or a legal substance along with addictive behaviors associated with the need to alleviate pain or discomfort (Davidson et al., 2008).

The Centers for Disease Control and Prevention (2016) conducted a longitudinal study from 2000 to 2014, that demonstrated the prevalence of opiate prescriptions abuse in the United States. According to the report, opiates, such as oxycodone, morphine, fentanyl, and other narcotic-based medications, were highly addictive and misused or diverted; meaning the patient is not taking the medication as prescribed or is giving away or selling the medication to other people. The misused or diversion of prescription medications caused 500,000 deaths or 78 fatalities each day due to opiate overdose. Furthermore, SAMHSA (2016a) indicated 50.5% of opiate abusers got pills from family and friends, and 22.1% got their pills directly from their physician.

The Center for Behavioral Health Statistics and Quality (2015) reported 1.6 million people in the United States abused prescription stimulants, of which 569,000, reported using homemade Methamphetamine. SAMHSA's (2016c) 10-year study of 1,614,358 admissions into treatment programs found only 6% were for Methamphetamine and amphetamine in 2004. However, by 2014, admissions for Methamphetamine and amphetamine as a primary drug increased to 9%. SAMHSA (2016c) reported 54% of admissions for Methamphetamine and amphetamine in 2014 were males with an average age of 33 years old, 67% were White, 18% were Hispanic, and 4% were Black. Additionally, SAMHSA (2016c) reported that 61% preferred to

smoke Methamphetamine and amphetamine, and 26% preferred injections as their primary route, while 8% preferred inhalation.

Some people used legal or illegal drugs once or occasionally and then never used them again. There are also those who used legal or illegal drugs repeatedly and risked becoming physiologically and psychologically dependent (Kreek et al., 2005; Lubman et al., 2004). Nielsen et al. (2008) attributed this difference to some people having a genetic predisposition; two-thirds of the people who used opiates do not experience signs of addiction.

The stigma of seeing patients as addicts and not associating their addictions with a neurological disease resulted in the need for Davidson et al. (2008) to advocate for social change. This change started with the addiction industry and the healthcare field. Davidson et al. (2008), as well as other researchers, such as Larkin et al. (2006), encouraged individuals, organizations, and the healthcare field to demonstrate a positive shift in the words they chose to use and the way they treat patients with addictions. They encouraged practitioners in the helping professions to become more person-centered. Person-centered is treating people as individuals, thereby providing individualized treatment plans and not generic interventions (Larkin et al., 2006).

Incorporating the person-centered approach across mental health and addiction settings could help diminish the stigma associated with substance use disorders, thereby allowing more people to accept their disorder and then seek treatment without feeling ostracized. Nonetheless, regardless of how professionals define the word addiction, and

the different approaches to treating the disorder, the stigma associated with addiction continued to permeate the United States as the number of people who reported abusing drugs outnumbered the reported number of patients that entered treatment (CDADP, 2013; SAMHSA, 2013a; UNODC, 2015a). For example, Baird (2015) documented there were 25 million Americans identified with an addiction, but only 1.6 million received treatment for a substance use disorder (SAMHSA, 2016c).

Gifford and Humphreys (2005) and Heidbreder (2008) offered reasons for people's continued chemical or behavioral addiction. They suggested the desire to repeat the initial euphoric experience initiated a reinforcing response. When exposed to the chemical, activity, or object a second time, people experienced sensations of satisfaction but not at the level of the initial introduction. The need to experience the initial level of euphoria developed into patterns of maladaptive behaviors associated with seeking out and repeating the use of the chemical, activity, or object.

Gifford and Humphreys (2007) reported patients could experience a chemical addiction while also struggling with a behavioral addiction. For example, patients could experience addiction to opiates while also struggling with gambling and compulsive shopping. If the primary addictive disorder remains untreated, it could become difficult to treat other identified addictive disorders, therefore, treating various addictive behaviors requires assessing the target of what drives the patterns of maladaptive behaviors in individuals (Gifford & Humphreys, 2007). These assessments must also identify the relationship between the function of the addictive behaviors and the environment

(Gifford & Humphreys, 2007). The DRLOC scale is an instrument that aids in measuring thought processes leading to maladaptive addictive behaviors and could potentially serve as a tool for pre and post assessment.

An extensive review of the literature revealed studies examining impulsiveness and a person's LOC, as it relates to substance use disorders. Altamirano et al. (2011) examined the relationship between impulsivity, LOC, and chemical addictions. They researched the use of the drug naltrexone that doctors prescribed to treat alcoholism. The researchers revealed participants with an internal LOC demonstrated an increase in impulsivity while taking naltrexone. Participants identified with external LOC had an opposite effect and demonstrated less impulsivity while on the medication.

Sheffer et al. (2012) examined nicotine dependence and LOC in a population with low socioeconomic status. The researchers revealed the population tended to have an external LOC and greater stress. The researchers concluded the targeted participants would most likely not achieve abstinence from tobacco after completing a treatment program. Furthermore, their study demonstrated external LOC reinforced impulsive traits that hindered abstinence. (Sheffer et al., 2012).

Bornovalova et al. (2005) examined the effects of both narcotic and stimulant use on behavior. They found chronic stimulant use could cause neurological damage which impairs judgment and decision making.

The Etiology of Substance Use Disorders

Understanding the mechanisms responsible for substance use disorders is important, as every individual enters treatment with their own complex biopsychosocial history (Gifford & Humphreys, 2007). This history could include a combination of genetic factors, environmental influences, and neurological changes in cognitive processes (Gifford & Humphreys, 2007; Grant et al., 2010; Nielsen et al., 2008). Different researchers have varying perspectives of what causes substance use disorders (Heidbreder, 2008). For example, Buckland (2008) theorized either genetic, environment, biology or personal experiences could make one person more susceptible than another. What is agreed upon is that foreign chemicals effect the brain and body's ability to function efficiently, causing neurological, psychological, and physiological dependence (NIDA, 2014). Some people develop an addiction that causes biopsychosocial disruptions in their daily life that decreases their quality of life, while others do not (Erickson & White, 2009). Attempts at achieving stability without continued abuse of the chemical is often challenging and involves chronic relapses (NIDA, 2014).

Genetics

Susceptibility to foreign chemicals may have very little to do with learned behavior and more to do with genetics (Levran et al., 2009). Genetics might play a significant role in one's susceptibility to dependence (Nielsen et al., 2008). All people have genetic variances associated with classes of drugs such as opiates or specific genetic heritability such as alcoholism (Kreek et al., 2005). For example, genetic researchers

discovered a propensity for alcoholism is due to receptor genes that correlate with dependent behaviors (Buckland, 2008). Levran et al. (2009) examined the genetic influence of heroin. They agreed heroin dependence, much like alcoholism, has a genetic component which contributes to patients being susceptible to ongoing drug use and chronic relapses.

Nielsen et al. (2008) suggested genetics might also provide a level of control when resisting addictive behaviors. Two-thirds of patients who started using opiates do not become addicted because of their genetic predispositions. However, approximately one-third of those who tried using opiates developed an immediate psychological and physiological dependence (Levran et al., 2009; Nielsen et al., 2008; Vohs & Baumeister, 2009). Their usage lead to the development of addictive behaviors and resulted in a diagnosis of substance use disorders (Levran et al., 2009; Nielsen et al., 2008; Vohs & Baumeister, 2009).

While gender and exposure to stress factors into a person's drug use, adding sensitization, vulnerability and genetic influences could increase the risk for addiction (Berridge & Robinson, 2016). Vohs and Baumeister (2009) concur and reported there is a need to factor in people's genetic makeup and neurological vulnerabilities, which could play a role in addiction and the propensity for multiple addictions. Berridge and Robinson (2016) reported, research in this area demonstrated the brain's sensitivity to drugs effects neurons like the dopamine, glutamate and mesolimbic neurons, and drug abuse effect neurotransmitters. For example, the shape of the mesolimbic neuron and the number of

dendritic spines could be altered. This causes a hyperreactive response to environmental triggers associated with a foreign chemical, reinforcing a person's need to obtain the primary drug more salient. Berridge and Robinson (2016) also reported individual vulnerabilities, such as genetics, gender, sex hormones, and major stressors are factors contributing to ongoing drug use for some people. A combination of these factors places a person at a higher risk for sensitization and potential substance use disorder.

Environmental Influences

The chronological sequence of the development of an addictive disorder begins with reinforcement of internal or external triggers (Gifford and Humphreys, 2005). As the person takes actions, such as seeking out and using drugs, the continued use of foreign chemicals turns into abuse and loss of control (Gifford & Humphreys 2005). When loss of control becomes apparent, it is due to the reinforcement of an acute neurological response to the foreign chemical causing euphoria (Gifford & Humphreys 2005). Heidbreder (2008) suggested this positive reward of euphoria initiates further drug-seeking behavior and impulsivity.

Kreek et al. (2005) thought the greatest risk factors for developing an addiction would surface during adolescence and young adulthood. In the United States, there was an increase in illegal drug use of 1.7% from 2008 to 2011 among young adults (Cabriales, Cooper, & Taylor, 2013). Young adults who make up 13.2% of the population also represented the highest percentage, 32%, of illegal prescription use (Cabriales et al., 2013). Carlson and Larkin (2009) discussed how addiction occurs because of young

peoples' inability to cognitively manage or behaviorally adjust to internal or external events that tax their coping ability. They further suggested addiction might affect people of all ages when stress is the catalyst (Carlson & Larkin, 2009). Cyders et al. (2007) and Whiteside and Lynam (2001) believed understanding the genesis of addiction begins with understanding the personality traits of an individual. However, they do not know the exact way personality contribute to developing addictions.

Neurobiology

The accumulated body of research indicated substance use disorders are the result of neurobiological reactions at a cellular level where molecules create structural changes and shifts in behavior (Heidbreder & Newman, 2010). Using a foreign chemical presents the potential for altering the brain's executive functioning, thereby affecting people's ability to control decision-making along with short and long-term memory (Heidbreder & Newman, 2010; NIDA, 2014).

Researchers further explained that tolerance of a foreign chemical is the body's way of seeking the initial effect experienced upon introduction of the chemical (Heidbreder & Newman, 2010). As time passes, the person needs more of the chemical to reach a desired euphoric state (Heidbreder & Newman, 2010). In other words, reaching tolerance required increasing the dose to maintain initial effects of the drug (Scimeca, Savage, Portenoy, & Lowinson, 2000). Neurological dependence is the result of the body building up a tolerance for a foreign chemical causing withdrawal syndromes with sudden cessation (Heidbreder & Newman, 2010).

Addiction is a complex neurological disease. Neural circuits in the brain send out different types of neurotransmitters that move from one area of the brain to others reinforcing addictive behaviors (Karim & Chaudhri, 2012). The dopaminergic system releases different neurons to the serotonergic, mesocorticolimbic, and endogenous opioid systems (Karim & Chaudhri, 2012; Leeman & Potenza, 2013; Neto & True, 2011; Niehaus et al., 2009). The main region of the brain responsible for reinforcing addictive behaviors is the mesolimbic reward system where primitive drives make people instinctively seek out food, shelter, and sex (Karim & Chaudhri, 2012). All drugs activate reward systems, but the mesocorticolimbic system is most important to understanding the reward circuit and addictive drives. It consists of two areas, the mesolimbic and the mesocortical pathways (Leeman & Potenza, 2013).

The ventral tegmental transmits the dopamine through the nucleus accumbens, also known as the mesolimbic pathway, and from the ventral tegmental to the prefrontal cortex, also known as the mesocortical pathway (Leeman & Potenza, 2013; Niehaus et al., 2009). Karim and Chaudhri (2012) included the endogenous opioid systems with the dopaminergic system as most influential to reinforcing additive behaviors through reward activation. Dopaminergic neurons activate reward circuitry in the brain located in the amygdala, the prefrontal cortex, the hippocampus, and frontal cortex regions (Leeman & Potenza, 2013; Neto & True, 2011).

Serotonin is a monoamine neurotransmitter, which travels through serotonergic pathways located in the ventral tegmental area of the brain the prefrontal cortex and the

amygdala (Neto & True, 2011; Niehaus et al., 2009). The serotonergic system releases low levels of serotonin increasing levels of risky behaviors (Neto & True, 2011). In contrast, the dopaminergic system releases elevated levels of dopamine, creating reward-seeking behavior (Neto & True, 2011). Leeman (2013) reported either high or low level of dopamine could lead to impulsive, risk-taking behaviors. Impulsivity, a characteristic of addictive disorders, render people helpless in the face of impetuous behaviors that the brain's reward system reinforces (Whiteside & Lynam, 2001). The reinforcement causes an uncontrollable urge or strong motivation to seek out drugs, thereby causing a lack of control over addictive behaviors associated with substance use disorders (Neto & True, 2011).

Heidbreder (2008) suggested dopamine was responsible for emotions and people's cognitive ability to function. The researcher further asserted that dopamine was the culprit responsible for ongoing activities associated with substance use disorders (Heidbreder, 2008). The nucleus accumbens produce two main dopamine sub-type neurons: dopamine D1 and dopamine D2 (Levran et al., 2009). Dopamine travels to the ventral tegmental area, then onward to the nucleus accumbens, the olfactory tubercle, and then the ventral striatum (Levran et al., 2009). The mesocortical and mesolimbic tract is the second passage from the ventral tegmental to the cortex (Littrell, 2010; Nielsen et al., 2008). These tracks work together in releasing dopamine throughout the brain, reinforcing positive and negative response to initiating addictive behaviors associated with substance use disorders (Littrell, 2010; Nielsen et al., 2008). Scientists have not

fully understood the expression of neuron receptors of dopamine D1 and dopamine D2, or how the nucleus accumbens mediates their interaction to reduce sensations of reward (Levran et al., 2009).

Researchers focused on specific areas of the brain that help the addiction industry understand the development of substance use disorders. For example, Schmitz (2005) indicated the nucleus accumbens are where three types of opioid receptors are located and are responsible for hedonic responses, Mu, Delta, and Kappa receptors. These receptors react to signals delivered from the central nervous system where three opioid systems called the Beta-endorphin, the enkephalins, and the dynorphins produce hedonic responses that initiate rewards or cravings (Levran et al., 2009; Schmitz, 2005).

There are other sections of the brain influenced by emotional stimuli. Nielsen et al. (2008) suggested the amygdala draws attention to emotional stimuli, such as stress or grief, thereby stimulating sensory input. This activation influences the orbitofrontal cortex, which modulates emotions. Nielsen et al. (2008) further explained both amygdala and the orbitofrontal cortex appear to influence each other through the stimulation of neurons. The orbitofrontal cortex receives information from the amygdala and indirectly from the amygdala through the anterior cingulate cortex. Nielsen et al. (2008) also suggested the prefrontal cortex is part of the brain responsible for executive functions, including self-control. Frontal lobes affect substance use disorders by causing acute effects to chronic dysfunctions (Nielsen et al., 2008).

Bornovalova et al. (2005) and Haile, Kosten, and Kosten (2008) discovered the introduction of stimulants into the reward circuitry dopamine partially blocks antagonists as they produce euphoria. Researchers determined that stimulants could interfere with perceptual motor speed and cause neuropsychological inhibition, impair behavior, as well as neuroanatomical abnormalities affecting concentration, memory loss, and the inability to learn information. Karim and Chaudhri (2012) suggested both chemical and behavioral addiction stimuli affect the neurological pathways. They further suggested overstimulation such as triggers in the environment has the potential of altering the reward circuitry and could cause repetitive behaviors that are out of one's control. Karim and Chaudhri (2012) called repetitive behaviors, addictive behaviors. Addictive behaviors are maladaptive behaviors responsible for the lack of control over actions and ability to think rationally regardless of negative consequences (DEA, 2013; Gifford & Humphreys, 2007; Grant et al., 2010; Sheffer et al., 2012).

As cases of substance use disorders increased, it was important to understand the underlying neurobiological mechanism and the neuro-adaptation of addictive behaviors associated with relapses. First, substance use disorders and the accompanied addictive behaviors influence neurobiological functioning (Buckland, 2008; Gifford & Humphreys, 2007; Grant et al., 2010; Kreek et al., 2005). Second, personality traits play a significant role in how a person reacts to their internal and external triggers (Cyders et al., 2007; Whiteside & Lynam, 2001). Finally, operant conditioning and negative reinforcement create a chronic cycle of repetitive behaviors each time a person experiences a stimulus in

the environment (Lefcourt, 1966; Rotter, 1975; Schmitz, 2005). Most importantly, Karim and Chaudhri (2012) concluded, any stimuli which alter the reward circuitry and causes repetitive behaviors could lead to addictive disorders.

Psychological and Physiological Dependence

Gifford and Humphreys (2007), and Grant et al. (2010) found the most pertinent indicator of being physically dependent on a foreign chemical is when the absence of the foreign chemical produces withdrawal symptoms. Withdrawal syndromes manifest as physiological and psychological reactions that cause discomfort. Physical dependence is the result of the body physiologically adapting to the introduction of the drug into the body's system on a regular basis (Gifford & Humphreys, 2007; Grant et al., 2010). To alleviate withdrawal, the person progressively needs to use more of the foreign chemical for symptoms to subside (Gifford & Humphreys, 2007; Grant et al., 2010).

Other signs a chemical dependence has developed are when a person becomes aware of the length of time in which the use of a drug occurs and the increased need to use more of the drug (Gifford & Humphreys, 2007; Grant et al., 2010). Gifford and Humphreys (2007), and Grant et al. (2010), further agreed that additional signs of neurological dependence and the development of an addiction include the time and energy consumed in seeking out, finding, using, and recovering from the use of the chemical.

Gender and Substance Use Disorder

In the field of addiction, conflicting ideology of treating all men and women as equal, compared to addressing gender-specific needs, was a dilemma for some treatment programs because men and women are different biopsychosocially (Lev-Ran, Le Strat, Imtiaz, Rehm, & Le Foll, 2013; Samuelsson, 2015). Researchers suggested there are gender differences when examining alcohol, prescription drug, and illegal drug abusers (Shannon, Jackson, Perkins, & Neal, 2014). This was consistent when examining patterns of drug use, dependence, prevalence, and specific attributes (Lev-Ran et al., 2013; Samuelsson, 2015). Green (2006) reported there was no relationship between gender and admittance to treatment. However, the researcher reported women tend to seek treatment earlier in their addiction cycle than men (Green, 2006).

Traditionally, when practitioners applied interventions through the lens of stereotypical masculinity and femininity roles, they placed men and women at equal risk of missing appropriate treatment (Samuelsson, 2015). They did not take "gender into account by acknowledging the different experiences, expectations, pressures, inequalities, and needs of women, men, transgender, and intersex people" (Samuelsson, 2015, p. 189), as well as cultural factors (Lev-Ran et al., 2013).

The United States population of men was 49% in 2014, while women represented 51%, documenting there were more women than men in the United States (SAMHSA, 2016c). In 2012, there were approximately 23.1 million people in the United States who needed treatment for substance use disorders, but only 2.5 million sought medical

attention (Yeom, 2015). In 2011, SAMHSA (2013b) reported 112,978 women were in opioid treatment programs compared to 161,688 men. This continued to be a statistical pattern. A longitudinal study conducted by SAMHSA (2016c) revealed more men entered treatment than women with 68% admission rate in 2004 compared to 66% in 2014. These statistics indicated a disproportionate number of men sought treatment in contrast to women (SAMHSA, 2016c).

Women. Across the United States, women represented 541,914 (34%) admissions out of 1,614,358 admissions into treatment programs. Within this population, the average age for women who used some form of stimulant was 33 years old for Methamphetamine and 44 years old for cocaine (SAMHSA, 2016d). The average age for narcotic use was 34 years old for heroin and 33 years old for opiates (SAMHSA, 2016d). SAMHSA (2016d) reported in 2014 women in California represented 57,781 (36%) admissions into treatment programs, out of a total of 158,434. Among the admissions in California, 21,084 reported Methamphetamines were the primary drug, 11,959 reported heroin was the primary drug, 4,074 reported opiates were the primary drug, and 2007 reported crack cocaine or cocaine were the primary drug (SAMHSA, 2016d).

When women entered treatment, they tended to report more serious biopsychosocial problems and physiological health issues (Choi, Adams, Morse, & MacMaster, 2015; Green, 2006; McNeese-Smith et al., 2009; Nelson-Zlupko, Fauffman, & Dore, 1995). Although both men and women had similar drug use patterns, substance use disorders had a greater effect on women's mental health (Green, 2006). Women presented with severe psychiatric scores and higher rates of mental health disorders

(Mahmood, Vaughn, Mancini, & Fu, 2013; McNeese-Smith et al., 2009). They also had a higher rate of physical issues (Mahmood et al., 2013; Shannon et al., 2014). Shannon et al. (2014) conducted a study examining substance users who were in prison and reported almost twice the number of women with a substance use disorder had a higher rate of mental health problems than men with substance use disorder. Women suffered from major depressive disorder, anxiety disorders (Kang & Deren, 2009; Shannon et al. 2014), and borderline personality disorder, compared to men who suffered from antisocial personality disorder (Shannon et al., 2014).

When examining medical utilization among women who used drugs, women met with more barriers than men. Kang and Deren (2009) reported, compared to men who had the Human Immunodeficiency Virus and were actively using drugs, women who actively used drugs and had the Human Immunodeficiency Virus tended to neglect their health by delaying treatment or experienced difficulty with getting treatment. They also experienced more symptoms associated with the Human Immunodeficiency Virus and experienced more side effects from the medication. Women also experienced sexual and physical abuse more than men, which were factors that kept women from utilizing healthcare services (Kang & Deren, 2009).

Women used drugs with their significant other (Kang & Deren, 2009), but did not use drugs as much as men and did not have as many drug related problems (Choi, et al., 2015; Green, 2006; McNeese-Smith et al., 2009). However, women were more susceptible to substance addictions and developed substance use disorders faster than

men (Green, 2006; McNeese-Smith et al., 2009). Women abused specific prescription drugs such as narcotic analgesics and tranquilizers due to mental health issues and for managing physical pain (Shannon et al., 2014). Lev-Ran et al. (2013) conducted a study examining gender differences in prevalence rates of substance use disorders among 11 substances: heroin, cocaine, cannabis, nicotine, alcohol, hallucinogens, inhalants sedatives, tranquilizers, opioids, and amphetamines. The study indicated women had a low lifetime prevalence for all the substances mentioned above. However, historical trends indicated women used, abused, and became dependent on prescription medications. Lev-Ran et al. (2013) also reported socio-cultural stigmas related to drug dependence might have been a factor in women limiting or avoiding heavy drug use.

When examining stigma associated with substance abuse, Hatgis et al. (2008) reported society does not hold women accountable for making poor judgments and viewed them as "victims of their circumstances" (p. 189). According to these authors, the women's degree of responsibility for problems related to alcohol and other drugs depended on the type of substance they misused. Haseltine (2000) argued the opposite, stating women who used alcohol and other drugs faced more criticism due to lack of family support, low socioeconomic status, and mental health disorders.

Historically, women performed poorly in alcohol and other drugs treatment programs when evaluating the lack of treatment success and low retention rates (Nelson-Zlupko et al., 1995). Prior treatment for women correlated with them having a mental health disorder, providers not referring them to treatment, and fewer voluntary

admissions (Haseltine, 2000). Typically, treatment programs for women centered on gender norms based on society's definition of femininity and biases that women need more help with medical and mental health assistance (Samuelsson, 2015).

Because of the shame and stigma associated with substance use disorders, women hesitate to seek treatment, resulting in experiencing higher levels of severity (Samuelsson, 2015). However, when women do take advantage of treatment they gravitate towards outpatient services (Choi et al., 2015; Yeom, 2015). When in treatment, women were actively engaged in the counseling process and used the services provided to them (Choi et al., 2015). They also seemed to benefit more from single-gender groups (Choi et al., 2015). Haseltine (2000) reported practitioners should have an awareness that women are internal thinkers and tend to self-medicate as a coping mechanism more than men do. Haseltine (2000) further stated women display more emotionality and are at greater risk of committing suicide.

Women face more barriers when seeking treatment (Green, 2006; McNeese-Smith et al., 2009). For example, women contend with a lack of childcare and lack of employment (Green, 2006; Mahmood, 2013; Shannon et al., 2014). Women have difficulty coping with their histories of physical or sexual abuse, poverty, and instability with housing, mental health issues, along with shame when seeking treatment (Mahmood, 2013; McNeese-Smith et al., 2009; Samuelsson, 2015; Shannon et al., 2014). Even with these barriers, women who completed treatment remained abstinent longer than women who did not complete treatment (Green, 2006).

Haseltine (2000) reported women experience repetitive cycles of relapse from treatment while facing the stigma characterized by the public as addicts. To understand why relapses continued to occur, researchers explored the brains' biochemistry. They found women's brain are organized different from men. For example, when interpreting word patterns, women use their left inferior frontal gyrus and their right hemisphere homolog to perform the same function as men.

To sustain treatment retention, some programs implemented therapeutic alliance models which focused on person-centered care, gender specific interventions, inclusion in treatment, and a host of other biopsychosocial interventions (Choi et al., 2015). Regardless of the services provided, reasons for retention success among women varied depending on the study (McNeese-Smith et al., 2009). Studies conducted by Green (2006) and McNeese-Smith et al. (2009) suggested retention success is due to women having fewer problems associated with their drug use and with mental health issues. Income and the ability to pay for services due to insurance coverage were additional factors (McNeese-Smith et al., 2009). McNeese-Smith et al. (2009) indicated predictors of retention success included the woman's single marital status, not being African American, or unemployed. Choi et al. (2015) agreed employment and higher incomes increased the possibility of success. A third study indicated legal referrals for treatment added to positive retention rates. Overall, both women and men had consistent treatment success when comparing retention rates, percentages of treatment completion, and long-term outcomes (McNeese-Smith et al., 2009). However, women tended to remain

abstinent longer, and relapsing increased when exposed to substance abusing romantic partners or when they experienced overwhelming personal problems (McNeese-Smith et al., 2009).

Mahmood et al. (2013) reported 69% of women in prison had substance use disorders diagnoses and had a higher rate of substance dependence than male prisoners. Mahmood et al. (2013) further reported from 1977 to 2007 the population of women in prison grew by eight hundred and thirty-two. Researchers indicated no differences in recidivism based on gender (Chen, 2009; Mahmood et al., 2013). Chen (2009) reported women abused drugs more than men during their incarceration, which made substance abuse an ongoing concern in prisons. Over 80% began abusing drugs within six months of returning to prison and 65% abused cocaine (Chen, 2009). Women who did not abuse drugs while incarcerated attributed their abstinence to lower coherence, greater levels of anxiety, and a higher potential for becoming victims of sexual assault (Chen, 2009). Minority women experienced greater vulnerability as they represented 70% of the prison population (Chen, 2009).

When focusing on treatment interventions, traditionally, women receive more attention than their male counterparts (Samuelsson et al., 2015). Researchers examining treatment outcomes in prison indicated gender played a significant role in achieving success (Shannon et al., 2014). Chen (2009) posted a need for "separate gender-oriented therapeutic interventions" (p.255). Mahmood et al. (2013) reported starting treatment in prison should transition into their lives upon their release. However, traditional treatment

approaches such as residential programs and community-based programs have not been successful for this population once they completed their period of incarceration (Mahmood et al., 2013). Their utilization of services is a strong predictor of whether they will have successful outcomes (Shannon et al., 2014; Yeom, 2015). Choi et al. (2015) reported completion of drug court programs assisted with women in decreasing the likelihood of relapse.

There are commonalities among gender that influenced outcomes, such as the person's age, primary drug, the level of education, employment status, and criminal history (Shannon et al., 2014). Mahmood et al. (2013) suggested treatment programs should focus on peer relationships among women with similar backgrounds. However, Green (2006) reported treatment programs that focused on specific genders bared similar outcomes as those serving both genders. Green (2006) suggested identifying triggers and outcomes throughout the treatment process. Brief low-cost interventions demonstrated positive outcomes for women (McNeese-Smith et al., 2009). Examples include interventions providing computer literacy and case management services for women on welfare (McNeese-Smith et al., 2009). Shannon et al. (2014) reported programs focusing on strengthening family relations, attending to medical issues and mental health concerns, along with drug abuse, resulted in positive post-treatment outcomes.

Men. In the United States, men represented 1,072,049 (66%) admissions out of 1,614,358 admissions into treatment programs (SAMHSA, 2016d). Among this population, the average age for men who used some form of stimulant was 33 years old for Methamphetamine and 44 years old for cocaine (SAMHSA, 2016d). The average age for

narcotic use was 34 years old for heroin and 33 years old for opiates (SAMHSA, 2016d). In 2014, men in California represented 100,567 (64%) admissions out of 158,434 admissions into treatment programs (SAMHSA, 2016d). Among these men, 27,214 reported Methamphetamines were the primary drug, 26,311 reported heroin was the primary drug, 4390 reported opiates were the primary drug, and 4365 reported crack cocaine or cocaine were the primary drug. Shannon et al. (2014) indicated age was a predictor for reduced recidivism. Men abused narcotics more than women and had an 11% higher rate of abusing illegal and legal drugs than women (Samuelsson, 2015; Shannon et al., 2014).

As referred to earlier, the Lev-Ran et al. (2013) study examined gender differences in the prevalence of substance use disorders among 11 substances: heroin, cocaine, cannabis, nicotine, alcohol, hallucinogens, inhalants sedatives, tranquilizers, opioids, and amphetamines. They found cannabis was the most commonly abused substance in male populations while heroin was the least abused (Lev-Ran et al., 2013). The researchers indicated men had a higher lifetime prevalence for all the substances included in the study. Men suffered from substance use disorders more than women and demonstrated higher rates of substance use disorders from prescription drugs (Lev-ran et al., 2013; Steingrimsson, Carlsen, Sigfusson, & Magnusson, 2012). Although men were less likely to abuse prescription drugs, the prevalence of prescription drug use that developed into a substance use disorder was higher for men (Lev-Ran et al., 2013; Nelson-Zlupko et al., 1995).

Haseltine (2000) revealed men experienced repetitive cycles of relapse from treatment while facing the stigma characterized by the public as addicts. To understand

patterns of behavior and why relapses continued to occur, researchers explored the brains' biochemistry. They reported men's brain organization interpreted word patterns by using more of their left inferior frontal gyrus, similar to women.

Hatgis et al. (2008) reported when considering gender differences; people held men more accountable for making poor judgments. Haseltine (2000) argued the opposite. He stated men do not face as much criticism as women. Problems for males was related to the type of alcohol or substance used.

When examining the lack of treatment success and low retention rates, historically men performed better than women in alcohol and other drugs treatment programs (Nelson-Zlupko et al., 1995). Pressure from family and social institutions seemed to be what caused men to initiate a search for treatment (Haseltine, 2000). When men entered treatment, the focus was on employment and education, not trauma (Samuelsson et al., 2015). Employed Caucasian men had better attendance and longer retention rates. Additionally, having an adequate income and medical insurance to pay for treatment had a positive correlation with high retention rates for men (McNeese-Smith et al., 2009).

A factor predicting success with retention for men was age. Researchers documented the older the man, the better success they had with staying in treatment (McNeese-Smith et al., 2009). Men referred by their employer also reported positive retention rates (McNeese-Smith et al., 2009). Most importantly, having goals associated with abstinence increased retention success for men (Choi et al., 2015). Choi et al. (2015) reported men's length of stay in treatment programs predicted lower rates of substance

use once out of treatment, along with decreased recidivism rates. Choi et al. (2015) also reported men who left treatment before completion experienced unfavorable treatment outcomes.

Primary drug use co-occurring with a mental health diagnosis proved to be a predictor of shorter retention rates for those who abused cocaine (Choi et al., 2015). However, men's problems stemming from substance abuse were less problematic than those experienced by women (Samuelsson et al., 2015). Practitioners should understand that men are external thinkers, social, and used drugs as a form of exploration (Haseltine, 2000). Shannon et al. (2014) found men were more active in criminal activities and committed their first crime 10.4 years younger than women did. However, when comparing recidivism rates, there was no differences based on gender (Chen, 2009). When examining the rate of drugs used among men in prison, Mahmood et al. (2013) reported men abused drugs at a higher rate than women. However, Chen (2009) indicated men remained abstinent for longer periods due to higher coherence, lower anxiety levels, and less hostile feelings. When men exited the legal system, they returned within two years (Shannon et al., 2014).

Chen (2009) posited the need for "separate gender-oriented therapeutic interventions" (p. 255). However, treatment programs focused on specific genders resulted in similar outcomes compared to treatment programs that serve both genders (Green, 2006). Shannon et al. (2014) reported significant success with post-treatment outcomes for both genders across treatment modalities. As a result, Green (2006)

suggested the focus should be on a need for treatment providers to focus on identifying triggers throughout the duration of services. Regardless of gender, there were several factors requiring attention when considering the need for positive outcomes, such as the person's employment status, primary drug, the level of education, and criminal history (McNeeses-Smith et al., 2009; Shannon et al., 2014). Practitioners should assure clients establish a goal of abstinence while receiving services (McNeese-Smith at al., 2009).

In conclusion, practitioners should be aware of the differences between genders when treating substance use disorders. Women are more likely to abuse licit drugs while men are more likely to abuse illicit drugs (Nelson-Zlupko et al., 1995). Practitioners should also apply various types of treatment interventions for each patient, taking into account their biopsychosocial needs that include age, ethnicity, gender, life experiences, trauma, and treatment history that would influence attrition rates (Samuelsson et al., 2015). Researchers demonstrated treatment services pathologize women's substance abuse and dependence while underestimating the needs of men (Samuelsson et al., 2015). Practitioners should be mindful of their personal biases and prejudices which marginalize and stigmatize men and women (Samuelsson et al., 2015).

Treatments for Substance Use Disorders

Mennis et al. (2012) reported 205 million people worldwide abused drugs in 2012, of which 35% to 85% did not receive treatment. The National Survey of Substance Abuse Treatment Services revealed from 2008 to 2012, 23.9 million Americans used illegal drugs, 9.2% of the total population (Cummins et al., 2009; Stanforth et al., 2016).

SAMHSA (2016b) examined opiate abuse in 2014. The report revealed 4.8 million Americans used heroin at least once that year and 4.3 million Americans abused prescription opioids or opiates. Banta-Green, Maynard, Koepsell, Wells, and Donovan (2009) documented the availability of prescription opioids resulted in an increased number of admissions into treatment programs across the United States from 0.9% to 4.2% in 2006. Baird (2015) reported the Division of Pharmacological Therapy oversees 1250 opiate treatment programs in the United States who provided services to approximately 300,000 patients each year. Providers anticipated a need for increased services would continue to rise as the number of reported abusers of prescription opioids increased.

The Center for Behavioral Health Statistic and Quality (2015) reported 1.6 million Americans abused prescription stimulants, of which 569,000, or one-third were homemade Methamphetamines. SAMHSA (2013a) indicated 947,000 people were dependent on or abused illegal drugs, but only 117,000 received treatment. In 2014, SAMHSA's (2016c) longitudinal study spanning from 2004 to 2014 reported 1,614,358 admissions for five primary drugs, 36% to treat alcohol abuse, 30% for opiates and heroin abuse, 15% marijuana abuse, 15% Methamphetamine and amphetamine abuse, and 5% for cocaine and crack cocaine abuse.

There are four types of treatment programs that address substance use disorders. SAMHSA (2016c) listed them as: Ambulatory, an outpatient treatment service that includes individual or group treatment and pharmacological therapy. This category also

includes intense outpatient treatment requiring two or more hours of treatment per day for at least three or more days per week. Detoxification could include 24-hour treatment in a residential facility or a hospital. This category also includes ambulatory outpatient treatment with or without pharmacological therapy. Rehabilitation includes residential short-term (30 days or less) or long-term (more than 30 days), or rehabilitation in the hospital for 24 hours. Medication-assisted opioid therapy consists of pharmacological therapy (methadone or buprenorphine) provided in an outpatient setting that could be intensive outpatient or detoxification program in a residential facility, hospital or ambulatory. Treatment could be administered during residential short or long-term programs or inpatient hospital treatment.

SAMHSA (2016c) conducted a longitudinal study in the United States spanning from 2004 to 2014. There were 1,614,358 admissions into treatment programs for alcohol abuse, opiate and heroin abuse, marijuana abuse, Methamphetamine and amphetamine abuse, and cocaine and crack cocaine abuse. SAMHSA (2016c) also reported opiates increased from 3% in 2004 to 8% in 2014. Opiate as the primary drug represented 19% of opiate admissions in 2004 and 27% in 2014. In 2014, men represented 53% of admissions for opiate treatment with an average age of 33 years old. Eighty-four percent of those admitted into treatment in 2014 were White. The primary route of use for 60% of those reporting opiate abuse used oral methods, and 17% reported inhalation as their route of choice.

SAMHSA (2016c) reported, admission into treatment for heroin abuse increased by 36% from 262,518 admissions in 2004 to 357,293 admissions in 2014. This represented an increase from 15% in 2004 to 22% in 2014 (SAMHSA, 2016c). Heroin as a primary drug represented 81% of the opiate admission in 2004 but decreased to 73% in 2014 with the average age at 34 years old. Two-thirds of heroin users were males, 69% were White, 14% were Hispanic, and 12 % were Black. The preferred routes of use were injection at 72% and inhalation at 22% (SAMHSA, 2016c).

SAMHSA (2016c) also reported, during 2004 cocaine admissions decreased from 14% to 5% in 2014. Crack cocaine as the primary drug represented 72% of cocaine admission in 2004 and 66% in 2014. The average age of crack cocaine users was 44 years old, and the average age for cocaine users was 38 years old. Of the total number of people who used crack cocaine, Blacks represented 56%, Whites at 32%, and Hispanics eight percent. Cocaine users consisted of 34% Blacks, 43% Whites, and 19% Hispanic. Inhalation was the primary route of use for 79%, while 11% preferred injection.

SAMHSA (2013a) reported during the year 2012, there were 1,611 treatment facilities in California, which offered opiate treatment programs, and 125,756 patients received treatment. A study conducted by SAMHSA (2015) indicated of the 158,435 Californians who received treatment for substance use disorders, 46,754 were for narcotics abuse, and 54,756 were for stimulants abuse. SAMHSA (2015) reported the increase of treatment facilities appeared to have had a significant impact.

As indicated above, in the United States men entered treatment more than women (SAMHSA, 2016c). For example, in California a disproportionate number of men entered treatment at a higher rate than women (SAMHSA, 2016d). SAMHSA (2016d) reported California had 158,434 admissions in 2014 for substance use disorders, which included 100,567 admissions initiated by men and 57,781 admissions initiated by women. When examining primary drug and gender, men represented 26,311 admissions into treatment for heroin compared to 11,959 admissions by women. Opiate admissions were about equal with 4,390 admissions initiated by men and 4,074 admissions initiated by women. Men had a slight edge with Methamphetamine and amphetamine admissions with 27,214 treatment attempts compared to 21,084 treatment attempts by women. For crack cocaine, men were responsible for 3,163 admissions while women represented 1,670 admissions. Cocaine also indicated men seeking treatment more often with 1,202 admissions compared to 337 admissions initiated by women. Therefore, a need exists for alternative treatment approaches to attract and retain women in treatment (Nelson-Zlupko et al., 1995).

Retention in treatment programs was a growing concern and a focus for Banta-Green et al. (2009) as they examined whether people who choose prescription opioids as their primary drug stayed in treatment longer than people who choose heroin. Banta-Green et al. (2009) demonstrated that people who abused prescription opiates had better retention rates than heroin abusers, due to fewer health problems and better social

stability. However, heroin users in methadone treatment programs tend to do better in treatment with adequate doses of methadone (Bao et al., 2009).

Treatment Approaches

Addictive behaviors encompass a constellation of maladaptive behaviors due to people's inability to self-regulate or control impulses when faced with internal and external stimuli, despite consequences of acting on these impulses (Grant et al., 2010; Rotter, 1966; Sheffer et al., 2012; Webb et al., 2010). In the addiction field, the question as to what type of treatment intervention works (12 step programs or empirically based techniques; such as harm reduction and biopsychosocial methods) is secondary to understanding the patient and the disorder (Bristow-Braitman, 1995).

Opiate and Opioid drug abuse is, "a major health and social burden" (Bao et al., 2009, p. 28). In 2000, there were 179,000 patients enrolled in methadone maintenance treatment programs in the United States (Scimeca et al., 2000). Methadone maintenance treatment programs provide methadone to patients with opioid and opiate dependence to prevent withdrawal (Bao et al., 2009). Bao et al. (2009) reported higher doses of methadone correlate with high retention rates, while high dropout rates are due to low doses of methadone. Banta-Green et al. (2009) reported treatment availability for prescription opiate users increased in the United States from 0.9% to 4.2% in 2006 and was anticipated to continue to rise as the need for treatment increased with the escalating rates of prescription abuse.

Banta-Green et al. (2009) emphasized how essential it is for effective treatment to be available for this growing population. Most concerning for Banta-Green et al. (2009) were the retention rates in treatment programs across modalities. Hall (2001) also expressed concern about retention rates among people diagnosed with substance use disorders. Hall (2001) hoped the administration of the DRLOC scale would help increase these rates across treatment modalities. Banta-Green et al. (2009) focused on the type of drug used to gain an understanding of retention rates among narcotic abusers. Banta-Green et al. (2009) found patients who used prescription opiate as their primary drug stayed in treatment longer than patients who used heroin as their primary drug. Furthermore, there were better retention rates for patients with a history of prescription opiates than with a history of heroin due to fewer health problems and better social stability (Banta-Green et al., 2009).

Practitioners and researchers continued to discover methods to treat addiction. From traditional treatment approaches, such as harm reduction (Rosenberg & Phillips, 2003), to the latest innovative approach to treatment, such as immunotherapy (Zalewska-Kaszubska, 2015), the field of addiction continues to change as counseling techniques and medical approaches show a significant difference in patient's quality of life. Therefore, it is necessary to assess a person's readiness to change behaviors associated with their primary drug and measurement of meaningful change in their Quality of life (Hall, 2001; Pasareanu et al., 2015). Lubman et al. (2004) indicated change is not easy and requires the belief that change could occur. It also requires motivation that drives a

person toward changing maladaptive behaviors and discipline to maintain a level of control over the impulsivity that feeds addictive behaviors (Lubman et al., 2004).

Patient-Centered Care. Davidson et al. (2008), as well as other researchers, such as Larkin et al. (2006), encouraged individuals, organizations, and the healthcare field to demonstrate a positive shift in how they treat patients with addictions. They encouraged practitioners in medical and mental health settings to become more person-centered, compared to focusing on a patient's diagnosis or disorder. Person-centered or client-centered care allows for individualized treatment plans and research approaches.

Rogers (1992) introduced the original concept of patient-centered or client-centered care as a theory. The theory consisted of six components: Recognizing there is an interaction between the two parties; patients and practitioners. Recognizing the presence of incongruence, meaning how the patient views his experience compared to the actual experience. The practitioner's acceptance and awareness of self and staying true and genuine to who he is as an individual. The practitioner's unconditional acceptance of the patient, meaning acceptance and caring for the patient as an individual. The practitioner's ability to have and express empathy, meaning meeting the patient where he is in his understanding of self and the experience that brought him into treatment. The patient's perception of the practitioner, meaning the patient awareness of the practitioner's acceptance of the patient and his situation and the empathy the practitioner presents.

According to Kirschenbaum and Jourdan (2005), over the years since the introduction of Rogers' theory of patient-centered care, researchers have narrowed these six elements down to three main components, "empathy, unconditional positive regard, and positively congruent" (p. 37). Incorporating the patient-centered approach across mental health and addiction settings could help diminish the underlining stigma associated with substance use disorders. This individualized approach to treatment aligns with individualized assessments. Along with cognitive behavioral therapy techniques, motivational interviewing, and several other evidence-based strategies, an individualized assessment helps practitioners learn more about the patient to develop a rapport that is supportive and less punitive (NIDA, 2008).

Conceptual Framework

Rotter (1966) explained the way people react to a situation or event depends on how much control they believe they have over the situation or event and their expectations of the outcomes. Rotter (1966) further explained the person's past helps to determine whether they experienced positive or negative reactions to current, similar experiences. Because of past experiences, the person expects similar outcomes in the future (Rotter, 1966). Rotter (1966) termed this generalized expectancy. To measure generalized expectancy and how much control people feel they have over current situations or events, Rotter and Mulry (1965) developed the Internal-External Locus of control (I-E LOC) scale. The I-E LOC scale was a unidimensional tool that provided a generalized assessment of LOC.

Over the years, researchers modified the I-E LOC scale from a unidimensional generalized instrument for measuring people's response to life's experiences to a multidimensional instrument targeting specific domains or topic of interest. For example, Keller and Blomann (2008) modified versions of the generalized I-E LOC scale to measure skills demand in the workforce and the health status of veterans (Marshall et al.,1990). In the field of addiction, Keyson and Janda (1972) modified the I-E LOC scale to address alcoholism by developing the Drinking Related Internal-External (DRIE) scale. Hall (2001) further modified the DRIE scale to develop an individualized instrument called the DRLOC scale, which addresses substance abuse.

Hall's LOC Study

Rotter (1966) developed generalized expectancy theory and the I-E LOC construct. The I-E LOC scale did prove useful in the area of addiction for some researchers. Researchers examined the relationship between LOC and narcotics, LOC and alcohol, and LOC and alcohol and other drugs (Berzins & Ross 1973; Calicchia, 1974; Cox & Luhrs, 1978; Rotter, 1966). Researchers addressed the limitations of the I-E LOC scale as a unidimensional instrument and its inability to transition from an individualist to a collectivist culture (Lefcourt, Von Baeyer, Ware, & Cox, 1979; Marshall et al., 1990; Smith et al., 1995). Hall (2001) concurred with the critics of the I-E LOC scale and set out to develop a domain-specific, individualized instrument to measure LOC (Bright, Kane, March, & Bishop, 2013; Hattrup, O'Connell, & Labrador, 2005; Lefcourt, 1992; Smith et al., 1995).

Keyson and Janda (1972) explored the concept of LOC related to alcohol abuse to develop the DRIE scale. The researchers translated the I-E LOC scale from a measurement of expectancy in the general population to an instrument that would measure expectancies of an individual (Davis et al., 2014; Keyson & Janda, 1972). There have been numerous studies examining the relationship between alcohol usage and LOC, but little research exists related to substance abuse and LOC (Hall, 2001). Hall (2001) wanted to explore how people with substance use disorders make decisions related to drug use and the concerns directly related to substance abuse, such as the relationship between self-esteem and low retention rates in treatment programs. To get a more accurate measurement of LOC in the substance use disorder population, Hall (2001) modified the DRIE instrument by changing the words on the DRIE associated with alcohol to words related to drugs. Hall (2001) called the new LOC instrument the DRLOC scale for assessing LOC in patients with substance use disorders. Hall (2001) argued an individualized assessment of LOC compared to a generalized assessment of LOC could provide a better predictor of treatment outcomes in men and women diagnosed with substance use disorders.

Hall (2001) and Davis et al. (2014) identified the DRIE scale as one of the first internal-external instruments modified from Rotter's original generalized I-E LOC scale, to measure a specific factor in the field of addiction. The DRIE scale measured people's perception of how much control they have over their behaviors associated with drinking alcohol and the recovery process (Davis et al., 2014). In 1978, Donovan and O'Leary

conducted a study to measure the reliability of the DRIE scale (Davis et al., 2014). Compared to other control-oriented instruments, the DRIE showed a significant correlation supporting the validity of the instrument and demonstrated "high-level test reliability alpha and Kuder-Richardson coefficients of internal consistency of .77" (Davis et al., 2014, p. 875). Research conducted using the DRIE scale demonstrated scores that discriminate between people who identify as being dependent on substances and those who identify as non-dependent on substances (Davis et al., 2014). Furthermore, measurements from the DRIE scale have proven to predict substance use behaviors after treatment (Davis et al., 2014).

The DRIE consists of 25 items and is a forced-choice instrument, with a score of two representing an external-LOC and a score of one representing an internal-LOC (Hall, 2001; Davis et al., 2014). With forced-choice instruments, participants must choose between two sets of statements presented to determine which more closely represents their belief system or behavior (Davis et al., 2014).

Hall (2001) modified the DRIE scale to measure expectations related to substance abuse. The goal was to transform the DRIE scale into a shorter version associated with drug use. To do this, Hall examined the analysis of the DRIE scale generated by Donovan and O'Leary in 1978. Hall selected 15 items from the DRIE instrument with high-factor loading and adjusted the questions by changing words related to alcohol with words related to drugs to create a forced-choice, internal-external instrument. Hall called the

instrument the DRLOC scale. The purpose of the DRLOC scale was to identify belief systems related to primary drug use by measuring expectancies related to drug use.

Hall's (2001) DRLOC scale (Appendix B) includes statements that measure drug use expectancies in drug-related situations to determine LOC. Forced choice items give two statements per item forcing the participant to choose one of the two statements. An example of a forced-choice item with two statements is item number six on the DRLOC; successfully kicking substance abuse is a matter of demanding work. The two statements presented are, A) luck has little or nothing to do with it, and B) staying clean depends mainly on things going right for you. Item A equal one point and item B equal 2 points. After the participant completes the instrument, the interviewer adds the numbers circled by the participant and divides the sum by 15 (the total number of items on the scale) to get the mean score. A score that is closer to one represents a more internally controlled locus, and a score that is closer to two indicate a more external locus. People with an internal-LOC score are more likely to be actively engaged, alert, and spontaneous people, trying to achieve their goals. They quickly and emotionally adjust with stronger interpersonal skills, actively seeks information, has a higher sense of self, and can make decisions independently. People identified as having an external-LOC score are more prone to be more depressed, have anxiety, and have limited abilities to cope with daily stressors.

After an exhaustive literature search, I found Ersche et al. (2012) was the most recent study using the DRLOC. Ersche et al. (2012) did a factor analysis of the DRLOC

scale by comparing it to Rotter's and Mulry's (1965) I-E LOC scale. Their study consisted of 592 volunteers, of which 282 were receiving treatment for narcotics, stimulants, or alcohol, while 310 reported no drug history and identified themselves as professionals and nonprofessionals. Among the participants of both groups, age and ethnicity did not vary significantly. However, gender was slightly different with 46% of men and 54% of females participating in the control group with no history of drug use represented. The percentage of men in the group with a history of drug use was 75% while women represented 25%.

The DRLOC scale has proven to be an appropriate instrument that could benefit patients and practitioners (Escher et al., 2012). Many studies have demonstrated one's LOC orientation shifts during the therapeutic process (Page & Scalora, 2004). Page and Scalora (2004) suggested that practitioners measure LOC from an external to internal shift while in treatment. The score thus becomes an indicator that the assigned interventions were a viable treatment strategy. Therefore, measuring shifts in LOC would help patients and practitioners develop appropriate interventions throughout the recovery process (Scimeca et al., 2000).

Researchers stated those who are diagnosed with substance use disorders are so because of their chronic relapsing patterns of behaviors. People who are diagnosed with substance use disorder continued to use regardless of the consequences to their health or productivity (Davidson et al., 2008; Gifford & Humphreys, 2007; Grant et al., 2010; Vohs & Baumeister, 2009). Examining one's cognitive processes related to substance

abuse is important to understanding multiple relapses and appropriate treatment. Ersche et al. (2012) explained that the DRLOC scale could effectively measure people's perception of impulse control over addictive behaviors. Ersche et al.'s (2012) study demonstrated a reliability of the DRLOC instrument at .81 for measuring thought processes. Therefore, utilizing the DRLOC scale during treatment could help practitioners understand patients thought processes related to their drug use, thereby helping practitioners develop appropriate interventions to meet the patient's individual needs (Ersche et al., 2012).

Internal-External Locus of Control Scale

The conceptualization for LOC consists of a bipolar construct spanning the spectrum from internal control to external control. People with an internal-LOC have an awareness and acceptance of positive or negative consequences resulting from their behaviors, while people with an external-LOC attribute achievements or lack of success to actions out of their control (Page & Scalora, 2004).

Some of the studies with the I-E Control scale explored task structure and I-E Control (Lefcourt, 1966). In 1955, one study examined interpersonal variables and I-E Control (Lefcourt, 1966). During 1959 to 1965, researchers explored the I-E Control and conformity and from 1960 to 1965 additional studies explored risk-taking and I-E Control (Lefcourt, 1966). The I-E Control research showed the construct of control or one's perceived control would be very useful in understanding behavior (Lefcourt, 1966). In fact, during the first 30 years of its conception, the construct of I-E Control and

expectancy were the most cited topics in the psychology and social science field with 4700 citations in Monograph since the first expository paper written by Rotter, Seeman, and Liverant in 1962 (Rotter, 1990).

Rotter and Mulry (1965) continued to research the I-E Control scale by administering the scale to college students ($N = 120$). There were 61 women, and 59 men participated in the studies as part of the entry-level psychology course. Researchers randomly assigned participates in two groups: an internal group (skill group), and an external group (chance group). The external group was the control group. The experiment consisted of angle matching tests of problems designed to be difficult. The researchers informed one-half of the sample group that the choices would be extremely difficult and would require luck to achieve the goal of discriminating. The other half of the sample group was informed that prior studies showed their choice might be difficult but with skill, one could achieve the goal of discriminating.

Two researchers conducted the study and asked the participants if they felt they would be successful in getting the trail correct during the next trail on a scale of 0 to 10. The researchers administered the I-E Control scale to half the participants before conducting the main experiment, and then after the main experiment administered the I-E Control scale to the other participants. The researchers did not score the results of the instruments. Instead, they took the participants and alternately placed them in either the change group or the skill group.

The second part of the study consisted of two procedures. One training consisted of eight trials. During these trials, all participants received equal reinforcements and then informed of being correct 75% of the time. The second part consisted of interviewers informing participants during the second and the fourth trials that they made wrong choices. Afterward, the final stage of the study included the extinction phase consisting of 50 consecutive trials. During this part of the experiment, each participant was told they were wrong everytime. If participants responded with 0 or 1 to the likelihood they would get the next trail correct, the study for that person ended.

The study resulted in an average score of 8.48 for the I-E Control scale, and a medium score of 8.0. The researchers identified mean scores nine or more as external thinkers and people who scored eight or less as internal thinkers. The overall result of the study concluded that participants instructed with chance discrimination resulted in 29 internal thinkers and 19 external thinkers. Participants instructed with skills discrimination resulted in 36 internal thinkers and 26 external thinkers. Rotter and Mulry (1965) indicated the results showed no significant difference between men and women. Informing internal thinkers that the tasks required skills slowed their decision-making process. External thinkers took longer to decide when told luck or chance was the determining factor.

As a result of this study, the I-E Control scale was renamed the I-E LOC scale and then published in 1965 by Rotter and Mulry. The goal of Rotter and Mulry was to find a more specific way of predicting reinforcement's influence on expectancies. The intent

was to have a low correlation with other scales used to measure behaviors (Rotter, 1966). Most importantly, the I-E LOC scale predicts and gauges behaviors across a broad range of potential situations and disciplines, and with no expectations of high internal consistency (Smith et al., 1995).

Over the years, researchers in the psychology and social science fields extensively studied the I-E LOC constructs with a focus on individualizing domains instead of limiting the scope to general topics (Hall, 2001; Page & Scalora, 2004). For example, researchers viewed the I-E LOC scale as a unidimensional instrument with a narrow scope of questions on several topics, of which drew lots of criticism. From this criticism, researchers started to modify the I-E LOC scale by creating a multidimensional instrument that provides broader questions for a specific topic (Hattrup et al., 2005; Lefcourt, 1992; Smith et al., 1995). Examples of some topics included happiness (Pannells & Claxton, 2008), anger and impulsivity (Deming & Lochman, 2008), communication (Lam & Mizerski, 2005), conscientiousness (Hattrup et al., 2005), Health (Marshall et al., 1990) productivity in the workplace and job performance (Forte, 2005; Smith et al., 1995).

Rotter (1966) further emphasized people who accepted their history of repeated failures due to events out of their control, could obtain a sense of control over what happens to them in the future. On the other hand, the researcher also explained, people who feel they have total control of their life, learn, in the face of adversity, there are things they cannot control.

Because of internal and external factors that influence people's behaviors, Bright et al. (2013) supported an individualized instrument and suggested a LOC instrument focused on a specified area would be more useful than a global instrument that covers multiple domains. Hall's (2001) DRLOC scale is an example of an individualized, multidimensional instrument, which focused on one domain, substance use disorders, and has demonstrated high capabilities for predicting outcomes compared to a generalized, unidimensional instrument like the I-E LOC scale (Ersche et al., 2012).

Summary

Addiction is best defined as being a brain disorder or neurological disease caused by molecular changes in the brain's chemistry due to foreign chemicals introduced into the system (Caan, 2012). Addictive Behaviors encompass a constellation of maladaptive behaviors forcing patients to lose control over their actions and their ability to think rationally regardless of negative consequences (DEA, 2013; Gifford & Humphreys, 2007; Grant et al., 2010; Sheffer et al., 2012). Mennis et al. (2012) reported 205 million people worldwide abused drugs in 2012, of which 35% to 85% did not receive treatment. The National Survey of Substance Abuse Treatment Services revealed from 2008 to 2012, 23.9 million Americans used illegal drugs, 9.2% of the total population (Stanforth et al., 2016; Cummins et al., 2009). According to reports in California, approximately 876,000 Californians used and abused illicit drugs in 2014 (SAMHSA, 2015a).

The newest paths scientists and researchers take explores the influence of addictive behaviors by examining neurobiology and genetic variations (Davidson et al.,

2008; NIDA, 2014). They seek to understand the brain's dysfunctions and how the brain influences compulsive and impulsive patterns of addictive behaviors (Lubman et al., 2004).

In the field of addiction treatment, there are four main types of treatment modalities: ambulatory, detoxification, rehabilitation therapy, and medication-assisted opioid (SAMHSA, 2016c). The question as to what type of treatment intervention works is secondary to understanding the patient and the disorder (Bristow-Braitman, 1995). Recognizing the role gender has in substance use disorders is important when deciding interventions. Nelson-Zlupko et al. (1995) reported on the differences between genders related to chemical addictions. Haseltine (2000) reported men used drugs as a form of exploration while women tend to self-medicate as a coping mechanism. Haseltine (2000) further reported women are internal thinkers and are more likely to abuse licit drugs while men are more external thinkers and are more likely to abuse illicit drugs.

It is necessary to assess a person's readiness to change behaviors associated with their primary drug and measure significant changes in their quality of life (Hall, 2001; Pasareanu et al., 2015). Incorporating a person-centered approach to addiction treatment could help diminish the underlining stigma associated with substance use disorders and bring more people into treatment (Davidson et al., 2008; Kirschenbaum & Jourdan, 2005; Larkin et al., 2006). Providing an individualized approach to treatment aligns with the implementation of individualized pre and post assessments (Foon, 1986; Hall, 2001). Pre

and post assessments help measure progress in treatment and success with individualized interventions and could assist in the development of future services (Foon, 1986).

One tool that could help measure progress in treatment is the DRLOC scale. According to Rotter (1966), LOC refers to people's perception of control based on past experiences and internal or external reinforcement in the environment. When applied to addiction and addictive behaviors, the amount of control or lack of control they had over the outcome of a similar event determined the patients' level of expectancy for positive or negative reinforcements (Rotter, 1966). Hall (2001) argued an individualized assessment of LOC compared to a generalized assessment of LOC could result in a better predictor of treatment outcomes (Rotter, 1966). As a result, Hall (2001) developed the DRLOC scale for assessing LOC in patients with substance use disorders.

The goal of this pre-experimental, quantitative study was to explore the potential relationship between LOC and primary drug use among men and women who had been diagnosed with a substance use disorders. I utilized secondary data from a study conducted by Hall (2001) titled, *Feelings About Drug Use, Drug-Related Locus of Control*, that examined men and women diagnosed with a substance use disorder by administering the DRLOC instrument. The methodological choices, as well as procedures I used to collect and analyze this data is detailed in chapter 3.

Chapter 3: Research Methodology

The purpose of conducting this study was to closely examine some of the data generated by Hall's DRLOC study. Hall developed and administered the DRLOC scale, which is an individualized assessment tool that measures LOC in patients diagnosed with substance use disorders. In this chapter, I provided a detailed description of Hall's DRLOC study and the UCLAs Integrated Substance Abuse Programs' original study titled Drug Treatment Process and Drug Treatment Counselor Practices and Effectiveness. Participants in the Feelings About Drug Use, DRLOC study were recruited from the Drug Treatment Process and Drug Treatment Counselor Practices and Effectiveness study. I examined the recruitment process, threats to validity, ethical procedures, methodology, and data analysis related to Hall's Feelings About Drug Use, DRLOC study.

Research Design and Rationale

The current study is a quantitative preexperimental static group comparison design using secondary data from research conducted by Hall to examine the effect gender and primary drug use has on DRLOC scores. Hall's investigation was part of a larger study conducted by the UCLAs Integrated Substance Abuse Programs', Drug Treatment Process and Drug Treatment Counselor Practices and Effectiveness study. The UCLAs study included 666 participants from 19 treatment programs. In addition to alcohol, there were responses from people who abused ten types of drugs. They were amphetamines, barbiturates, benzodiazepines, cannabinoids, cocaine, methadone,

methaqualone, opiates, phencyclidine, and propoxyphene (Hall, 2001). Hall (2001) conducted a follow-up study using 553 of the original 666 participants.

Hall (2001) dealt with whether there was a relationship between LOC scores and self-esteem in people with substance use disorders and whether the DRLOC scale outcomes related to retention rates in treatment programs. This current study examined DRLOC scores by extracting from Hall's 553 participants a sample size of men and women who identified narcotics or stimulants as the primary drug for which they were being treated.

Using the data generated by the UCLAs Integrated Substance Abuse Programs as secondary data provided an existing structure for proceeding with examining the three variables presented for the current study. Hall (2001) reported the original study conducted by the UCLAs Integrated Substance Abuse Programs examined the process associated with drug treatment and counseling practices, along with their effectiveness in relation to drug treatment. Hall (2001) examined the usefulness of identifying LOC and self-esteem as it related to substance abuse. The current study builds on the understanding gained from these two previous studies by examining the effect gender and primary drug had on the DRLOC score.

Methodology

Population

I conducted the current study using secondary data generated by the UCLAs Integrated Substance Abuse Programs' Drug Treatment Process and Drug Treatment

Counselor Practices and Effectiveness study. The sample size in the UCLAs study was 666 participants diagnosed with substance use disorders from 19 drug treatment programs. From the UCLAs Integrated Substance Abuse Programs' study, 553 participants agreed to participate in Hall's (2001) Feelings About Drug Use, DRLOC study.Hall reported among the participants there was a mean age of 36.2 (*SD* = 9.58), a mean year of education of 12.2 (*SD* = 2.47), and a median household income of $10,000-14,999. There were more females (*n* = 300, 54.2%) than males (*n* = 253, 45.8%), and the majority of participants were either Caucasian (*n* = 227, 41.1%), African-American (*n* = 178, 32.2%), or Latino (*n* = 103, 18.6%).

Original Study's Procedures for Recruitment

According to Hall (2001), the UCLAs study recruited participants from 19 drug treatment programs in Los Angeles County representing five different treatment modalities: Inpatient and outpatient treatment, residential, day treatment, and methadone programs. The researchers assured the representative programs reflected proportionately with each treatment model within Los Angeles County. Each program's number of participants proportionally represented the population within their respectful treatment modality. They randomly selected participants from large programs to assure 30 participants per program. For smaller programs, the staff selected patients to participate, including new admissions, until they obtained 30 participants. Variations existed among the programs related to time in treatment and philosophy.

Of the 666 participants in the University of California Los Angeles study, 101 participants refused to participate in Hall's (2001) DRLOC study. Additionally, Hall's final sample only included those with 12 or more non-missing responses across the 15 DRLOC items, resulting in a final sample of 553 participants. Trained interviewers conducted the meetings with each participant. The requirements for participation in the DRLOC study included being in treatment for at least two weeks. The University of California Los Angeles Integrated Substance Abuse Programs granted permission for participants recruited from detoxifications programs to participate for 3 to 5 days after admission into their program. The interviewers held the meetings in private rooms located at each treatment facility. The interviews lasted approximately 45 minutes, and each participant received $10 for their participation and $5 for contributing a urine sample.

Permission to Use Archival Data

The procedure required to obtain approval to use the UCLAs Integrated Substance Abuse Programs' data from the Drug Treatment Process and Drug Treatment Counselors Practices and Effectiveness study, and the Feelings About Drug Use DRLOC study, consisted of contacting Hall via email with a formal request to use the data from the Feelings About Drug Use, DRLOC study. Hall provided required documents needing signature and information from the researcher, the Chair, and representatives of Walden University's Institutional Review Board (IRB). Additionally, I obtained approval from Walden's IRB by signing the data use agreement to assure proper use of the data. I

secured all the letters and emails to and from Dr. Hall and official documents in a locked file in my home office (see Appendix A).

Archival Data Sampling Procedure

Eligible participants from Hall's data consisted of those with non-missing data on DRLOC, primary drug, and gender. A filter was created so that only eligible participants were included in analyses. Hall did not report there was any missing data regarding DRLOC or gender, so exclusions were based on those whose primary drug was not a narcotic or stimulant. According to Hall's codebook, there were three other primary drug categories: alcohol, marijuana, and other. Hall did not report proportions by primary drug; however, Spear, Crevecoeur, Rawson, and Clark (2007) reported that 56.6% of treatment admissions in Los Angeles County between 2001 and 2005 were for narcotic or stimulant drugs and the remaining 43.4% were for alcohol, marijuana, or other drugs. Therefore, it was reasonable to expect that of Hall's 553 participants, half or more were likely to be eligible for the proposed secondary analyses. Based on a sample size of 402, a G*Power sensitivity power analysis calculates a 2x2 full factorial ANOVA would detect as statistically significant ($p < .05$) a small partial $\eta^2 = .02$ (Cohen's $f = .13$) for a main effect or interaction.

Instrumentation and Operationalization of Constructs

Hall (2001) developed a LOC instrument called the DRLOC scale modified from the DRIE scale, which addressed LOC and alcohol. Hall modified the DRIE instrument by changing the words associated with alcohol to words associated with drugs to develop

the DRLOC scale. Hall administered the DRLOC scale in a secondary study to participants who had participated in the Drug Treatment Process and Drug Treatment Counselor Practices and Effectiveness study conducted by UCLAs Integrated Substance Abuse Programs (Hall, 2001). The goal of the second study, titled Feelings About Drug Use, DRLOC, was to measure drug-related LOC in patients receiving treatment for substance use disorders (Hall, 2001).

The DRLOC scale was the latest LOC instrument in the field of social science, spanning over 70 years. Hall analysis of the DRLOC instrument found $\alpha = .81$. Hall measured internal consistency by applying Cronbach's alpha and the split-half procedure using the Spearman-Brown Prophecy formula. Hall explained the Feelings About Drug Use, DRLOC study was large and hindered the procedure for test-retest reliability and examined other measures to test convergent validity by examining correlations of scores. This included participant's DRLOC score and Addiction Severity Index scores which positively correlated ($r = .301$ $p < .00$). This demonstrated that high scores generated from the Addiction Severity Test (except for the subscale, Medical) correlated with a high score from the DRLOC (external-LOC). It should be noted that of the seven domains on the Addiction Severity Index scale (medical, employment, alcohol and drugs, legal, family and social relationships, and psychiatric) the subscale of alcohol and drugs demonstrated the highest correlations with a score of .283.

Hall (2001) reported the results from the DRLOC study indicated men's LOC scores were higher than women ($p < .01$). Mean scores among ethnic groups indicated

Latino's scores were significantly high with LOC mean at 1.34, ($p < .01$). Hall also reported there was no significant difference in LOC among age groups. However, there was a significant difference between participants across treatment modality at $p < .01$. Hall discussed how participants from hospital inpatient treatment programs had the highest mean at 1.51 compared to participants from outpatient drug-free programs with the lowest mean at 1.19. The DRLOC scale positively correlated with the Addiction Severity Index at .301, which indicated that as addiction severity increased, scores on the DRLOC tend to increase toward external-LOC values.

For this study, , the DRLOC scale functioned as the dependent variable. The score obtained from the DRLOC scale served to measure the differences among men and women who used narcotics versus stimulants. The DRLOC scale consists of 15 forced choice items that give two statements for each item forcing the participant to choose one of the two statements identified as A or B. Statement A equal one point and statement B equal 2 points. The 15 items measure LOC on a continuum from internal to external. After the participant complete the DRLOC scale, the interviewer adds the numbers circled by the participant. The numbers circled for items 1, 3, 5, 8, 11, 14, and 15 must be reverse coded. After recoding, the DRLOC score is computed simply by taking the mean score of all the items. The total score is then divided by 15 (the total number of items on the scale) to get the mean score. A score that is closer to one represents a more internally controlled locus, and a score that is closer to two indicate a more externally controlled locus.

As applied to this study, people with a score closer to one is considered to have an awareness and acceptance of positive or negative consequences resulting from their drug use, while people with a score closer to two is considered to attribute positive or negative consequences from drug use as actions out of their control. E. A. Hall (personal communication, June 20, 2016) identified the variable named "flocscor" in the archival SPSS data set as the 15-item composite mean representing DRLOC scores. Scores from participants who identified narcotic or stimulants as their drug use at the time of treatment are included in the sample population and analysis.

Drug use, as defined in this study are narcotics and stimulants, and served as the independent variable that represented the two categories. This study examined the extent by which DRLOC scores differ with narcotic use versus stimulant use. Hall's research identified seven categories for drug use in her study, of which alcohol, marijuana, and the category, other, was excluded from my sample and analysis. Hall listed narcotics as a self-contained category and in her codebook assigned code 7. The categories that consists of cocaine, crack, amphetamine and Methamphetamine were recoded into a single category to represent stimulant.

The second independent variable in this study was gender. As represented in Hall's study and listed on the initial intake form, gender comprised of two levels, male and female. The archival SPSS data set had this variable coded as follows: male = 1, female = 2. The importance of examining gender in this study was to determine if a class of drugs being used by men versus women impacted DRLOC scores.

Demographics for Hall's DRLOC study was obtained from participants and coded. Some of Hall's demographics: race, education, and socioeconomic status, were included in this study as a covariate in the primary analysis. Not addressed in Hall's data set was information on age. This study included age by calculating the difference between 1996 (which was the intake interview year) and the year of birth, which was on the demographic questionnaire. The number obtained would represent the age of the participant at the time of treatment intake.

In Hall's study, participants were asked to identify self by race. Hall provided a list of seven options with assigned codes: White = 1, Black or African-American = 2, Asian or Pacific Islander = 3, Native American = 4, Hispanic = 5, Multi-racial = 6, and other = 7. In the archival SPSS data set the variable is f1q13 and its label. "race".

Hall's question about education was how many years of schooling the participant completed. As noted in Hall's codebook, the question was labeled "# years school completed" and could be found in the archival SPSS dataset named flq16.

An important demographic obtained from Hall's study and evaluated as part of this study was socioeconomic status. As part of Hall's archival SPSS data set socioeconomic status named f1q23 and labeled "your 95 income range". The range documented in the codebook was list as under $19,000 to over $200,000. Within this range, participants were given 19 categories to choices from.

Research Question, Hypotheses, and Analysis Plan

The dependent variable was DRLOC scores, in which a low score indicates an internal-LOC and a high score indicates an external-LOC. The independent variables were primary drug (narcotic or stimulant) and gender (male or female). Of primary interest was the effect of the primary drug on DRLOC score, but because Hall (2001) found males had statistically significant higher DRLOC scores than females, it was important to control for gender and examine any interaction effect between gender and primary drug. To simplify the hypotheses that followed, the test of a specific effect assumed statistical control for the other effects.

RQ1: To what extent do DRLOC scores differ by primary drug (narcotic vs. stimulant), gender (male vs. female), and their interaction?

$N_0 1$: There is no statistically significant difference ($p > .05$) in DRLOC scores between participants whose primary drug was a narcotic versus a stimulant.

$N_a 1$: There is a statistically significant difference ($p < .05$) in DRLOC scores between participants whose primary drug was a narcotic versus a stimulant.

$N_0 2$: There is no statistically significant difference ($p > .05$) in DRLOC scores between males and females.

$N_a 2$: There is a statistically significant difference ($p < .05$) in DRLOC scores between males and females.

$N_0 3$: There is no statistically significant interaction effect ($p > .05$) between primary drug and gender on DRLOC scores.

N_a3: There is a statistically significant interaction effect ($p < .05$) between primary drug and gender on DRLOC scores.

To test the hypotheses and answer the research question, a 2x2 full factorial ANOVA was conducted. This helped to simultaneously test the main effect of the primary drug, the main effect of gender, and the interaction effect. If any of the other study variables—age, race, socioeconomic status, or education—is found to relate to DRLOC scores, it was entered as a covariate in the primary analysis.

Threats to Validity

Hall's sample population for the DRLOC study was recruited from the previous study conducted by the UCLAs Integrated Substance Abuse Programs. A threat to external validity could occur from participant's knowledge of moving from one study to another with researchers they are familiar with. Because of this knowledge participants' reaction to topics presented might influence behavior because of familiarity. An extraneous variable is the potential the participant is under the influence of stimulants or narcotics. Active drug use could influence behavior and thought processes, thereby effects the responses to the DRLOC scale.

Selection bias could be another threat to internal validity due to the five stages of change and motivation associated with the process of recovery and addictive behaviors (DiClemente, 2003; Norcross et al., 2011; Prochaska & Norcross, 2001). The five stages of change demonstrate the level of awareness a participant has about their addictive behaviors, and how this awareness influences their recovery (DiClemente, 2003;

Norcross et al., 2011; Prochaska & Norcross, 2001). According to the theory of stages of change, those who chose to participate in the study are more likely to fall in the later stages of change compared to the first two stages of change (DiClemente, 2003; Norcross et al., 2011; Prochaska & Norcross, 2001). The effect this could have on the study is significant if the majority of participants are in the later stage of recovery.

Furthermore, the phenomenon of participants giving a socially appropriate response compared to honest responses representative of their addictive behaviors and thought processes could affect internal validity. According to Davis et al. (2014), self-report instruments tend to move people to respond in a way that is contrary to how they might respond if the possibility of tracking their answers existed. Davis et al. (2014) reported the need to present oneself in a favorable way, to make a positive impression, or to exaggerate responses to feeling socially acceptable are all concerns when administering self-report instruments like the DRLOC scale. Davis et al. (2014) further reported what is most important when using a self-report instrument to measure treatment success in people with substance use disorders is the need to stay aware of a person's reason for treatment, as well as their need for social desirability (Davis et al., 2014).

Ethical Procedures

The UCLAs Integrated Substance Abuse Programs, Dr. Hall, the researcher of the Feelings About Drug Use, DRLOC study, the Chair over the current study, and a representative of Walden University's Center for Research Quality, Institutional Review Board agreed the need for reviewing ethical procedures for securing the dataset. The

procedure included securing the data during its use and not sharing or using it in an unethical way. Furthermore, we agreed I would secure the original copy of the dataset on an external drive and stored in a locked safe. The copy used with SPSS program would be on a secure desktop that has a secure access code. Finally, I contacted Walden's Center for Research Quality, Institutional Review Board to provide written permission through the application process to move forward with obtaining and assuring the security of the dataset. Once the study was completed, I would store the dataset for five years. Afterward, I would delete the dataset from my hard drive and external drive. I would send notification of this action to Dr. Hall, UCLAs Integrated Substance Abuse Programs, and Walden's Center for Research Quality, Institutional Review Board. A copy of the permission forms and agreements to use the dataset is in Appendix A.

Any information that could reasonably identify participants was removed or coded if this process had not already been completed in the dataset. This process would include removal of participant's name, geographical location of residence, personal information such as telephone numbers, emails, social security numbers, medical record numbers, driver license, photos of participants, or any other identifiers that could be used to connect the participant with the study. For this study, one identifier was used as the date of birth in order to obtain the age of participants at the time the study. Upon completion of the study, results of the findings will be written and downloaded onto a CD, placed in a sealed envelope, and then forwarded to Dr. Hall by the United States Postal Service.

Summary

I conduct a quantitative, pre-experimental static group comparison secondary analysis of Hall's (2001) study, which itself, was a follow-up on a larger study by UCLAs Integrated Substance Abuse Programs. From Hall's data set of 553 participants, I extract and analysis a subset of 402 participants. The total size of the subset depended on the number of participants with non-missing data on the key study variables of DRLOC scores, primary drug as either narcotic or stimulant, and gender. The purpose of the current study was to examine differences in DRLOC scores between males and females and between the two categories of primary drug. The results of this examination are presented in Chapter 4.

Chapter 4: Research Methodology

Introduction

The purpose of conducting this preexperimental quantitative study through secondary analysis was to reexamine data on individuals who received treatment for their substance use disorders. Specifically, to examine the main factorial effects of primary drug (narcotic vs. stimulant), gender (men vs. women), and their interaction on DRLOC score. The score generated from the DRLOC instrument is summed and then divided by 15. A score closer to one represent an internal-LOC, indicating a person is more likely to be actively engaged, has a higher sense of self, and can make decisions independently. A score closer to two represent an external-LOC, indicating a person more prone to depression, anxiety, and a limited ability to cope with daily stressors (Hall, 2001).

Chapter 4 consists of a description of how the secondary data was obtained as well as the results of the statistical analysis. Non-significant and statistically significant results of comparisons between the three variables are provided with the use of between subject analysis and factorial ANOVA. Reliability of the DRLOC was presented as well as screening of targeted demographics for potential covariates. Finally, a summary of the results presented in Chapter 5 with an introduction to Chapter 5 is provided.

Archival Dataset

The archival dataset utilized in this study was created by UCLAs Integrated Substance Abuse Programs' Drug Treatment Process and Drug Treatment Counselor Practices and Effectiveness study. The sample size in UCLAs study was 666 participants

who were diagnosed with a substance use disorder. The participants were recruited from 19 drug treatment programs in Los Angeles County. From the UCLAs Integrated Substance Abuse Programs' study, 553 participants agreed to participate in Hall's (2001) Feelings About Drug Use, DRLOC study. Hall's goal was to measure drug-related LOC in patients receiving treatment for substance use disorders. To conduct the current study, Hall was contacted with a request to use the data collected from the Feelings About Drug Use, DRLOC study. Upon agreement regarding how the data would be used and secured, Hall provided the dataset with a codebook for the study. Upon examination of the 553 participants, a subset of 402 participants who indicated either a narcotic or stimulant as their primary drug was identified.

Variables of Interest

The focus of the Effect Gender and Narcotic or Stimulant Abuse has on Drug-Related Locus of Control [DRLOC] (Travis, 2018) study was to determine if primary drug use among men versus women affected the DRLOC score. The variables of interest were DRLOC scores, primary drugs, and gender. Hall's code for variables used in the main dataset was used for the Effect Gender and Narcotic or Stimulant Abuse has on DRLOC (Travis, 2018) study. The code Flocscor represented a 15-item composite score from the DRLOC scale (flocq51 to flocq65). For ease of output, Flocscor was renamed drloc. The variable that represented main drug treated was coded F1q8 and renamed primary drug. Narcotics was recoded as 1. Cocaine, crack, amphetamine, and Methamphetamine were combined and coded as 2. All other drug types were recoded as

not applicable. The variable Male was coded 1 and female was coded 2. Other variables of interest in this study were race, education, income, and age. F1q13 was renamed race, f1q16 for education was renamed years of schooling, and f1q23 for income was renamed household income to represent socioeconomic status. The dataset did not contain a variable for age. Age was calculated by subtracting year of birth (f1q12) from 96 (the year the data was collected), to represent age at intake.

Eligible Cases

Eligible cases were defined as cases with nonmissing data for drloc, primary drug, and gender. Of the cases presented in Hall's original dataset, 108 were missing drloc scores, 34 did not identify a primary drug, and 21 did not provide a gender. There were 402 cases that had valid data and were eligible for analysis. A filter was created so that all subsequent analyses were based only on these 402 cases.

Descriptive Statistics

To describe the sample population for this study, the age, race, socioeconomic status, and education level of the sample population was reported. Operationalization of demographic variables was conducted to determine potential relationship to the DRLOC score to be reported as a covariate in the primary analysis. Of the 402 participants in the current study, 161 (40%) were male and 241 (60%) were female. Two Hundred and Eighty-five (70.9%) participants reported stimulants as their primary drug while 117 (29.1%) reported using narcotics as their primary drug.

Of the 402 participants, 157 (39.1%) were White, 135 (33.6%) were Black/African American, 16 (4%) were Asian/Pacific Islander, 5 (1.2%) were Native American, 76 (18.9%) were Hispanic, 10 (2.5%) were multiracial, and 2 (.5%) were identified as Other. One participant's data was missing in the system and represented .2% of the 402 participants. When examining age, the youngest participant was 19 and the oldest participant was 69 (M = 35.46, SD = 8.49). The median was 34. Skewness and kurtosis were both less than 1.0 and within acceptable range of normal distribution with skewness at .690 and Kurtosis at .731.

Hall (2001) indicated the education level of those who participated in the study averaged 12.2 years. The sample population for this study ranged from a minimum of 6 years to a maximum of 26 years of education. Years of education had a high kurtosis at 5.894 because one case reported 26 years; the next closest was 20. The outlier case was recoded to 20, which brought the distribution of the variable within acceptable normal range with kurtosis at 1.730 and skewness at .678. The normal range was a skewness of less than the absolute value of 3 and kurtosis less than the absolute value of 7 (Kline, 2016). After recoding, the mean was 12.03, standard deviation was 2.25, and the median was 12.

In the case of household income, this variable was coded as range because it was an ordinal variable. The means 3.4091 is not itself valid, but it was used to state that the average income was between $15,000 and $24,999. The minimum and maximum

household incomes were $10,000 to over $200,000, respectively. There were 212 participants (53.5%) that had household income under $10,000.

DRLOC Reliability and Descriptive Statistics

Scores generated from the DRLOC ranged between 1 and 2. People with a score closer to one are considered to have an awareness and acceptance of positive or negative consequences resulting from their drug use, while people with a score closer to two are considered to attribute positive or negative consequences from drug use as actions out of their control (Page & Scalora, 2004). Ersche et al. (2012) demonstrated a reliability of the DRLOC instrument at .81 for measuring thought processes. For this study, as presented in Table 1 and Table 2, the DRLOC had good reliability at .816. Skewness and kurtosis were within acceptable range of normal distribution.

Table 1

DRLOC Descriptive Statistics

Statistic	Value
# of items	15
Cronbach's alpha	.816
M	1.21
Median	1.13
SD	.21
Minimum	1.00
Maximum	1.93
Skewness	1.10
Kurtosis	0.52

Inferential Analysis

The research question examined for this study was: To what extent do DRLOC scores differ by primary drug (narcotic vs. stimulant), gender (male vs. female), and their interaction?

N_01: There is no statistically significant difference ($p > .05$) in DRLOC scores between participants whose primary drug was a narcotic versus a stimulant.

N_a1: There is a statistically significant difference ($p < .05$) in DRLOC scores between participants whose primary drug was a narcotic versus a stimulant.

N_02: There is no statistically significant difference ($p > .05$) in DRLOC scores between males and females.

N_a2: There is a statistically significant difference ($p < .05$) in DRLOC scores between males and females.

N_03: There is no statistically significant interaction effect ($p > .05$) between primary drug and gender on DRLOC scores.

N_a3: There is a statistically significant interaction effect ($p < .05$) between primary drug and gender on DRLOC scores.

Screening of Demographics as Covariates or Confounds

The demographic variables, education level, socioeconomic status, age and race were screened as potential covariates or confounds. As a result of the screening, education level, socioeconomic status, and age did not demonstrate a direct influence or

had an effect on DRLOC scores. Therefore, the demographic variables were not included as a covariate in the primary analysis.

Race was recoded into 4 categories because some of the original categories had very small numbers of cases: White, African-American, Hispanic, all other. The "All Other" category included Asian/Pacific Islander, Native American, and Multi-racial. Levene's Test of Equality of Error Variances was conducted to test the null hypothesis that the error variance of the dependent variable, DRLOC score, was equal across groups. Levene's test was significant, meaning the groups did not have equal variance. However, according to Tabachnick and Fidell (2007), if the ratio of the largest group variance to that of the smallest group variance is less than 10, than it is okay. In this case the ratio was 2.2 ($.248^2$ divided by $.168^2$).

Analysis of between-subjects presented in Table 2 below, demonstrated DRLOC scores do statistically significantly differ by race, $F(3, 398) = 7.07$, $p < .001$, eta squared = .05 (a medium size effect). Hispanics had higher DRLOC scores than both White and African American groups.

Table 2

Effect of Race on DRLOC Scores

	DRLOC			
Race	*N*	*M*	*SD*	Homogeneous Subsets[a]
White	157	1.22	.22	a
African-American	135	1.16	.17	a
Hispanic	76	1.29	.25	b
All other	34	1.19	.18	a, b

[a] Racial categories with the same subset letter did not statistically significantly differ.

To further screen for race and its relationship with primary drug, further analysis showed there were more African Americans in the stimulant group (n = 121) than statistically expected (n = 95.7), and more Hispanics in the narcotic group (n = 42) than statistically expected (n = 22.1), $\chi^2(3, N = 402) = 49.51$, $p < .001$, Cramer's $V = .351$. There were more female African Americans in the study (n = 94) than statistically expected (n = 80.9), and more male Hispanics in the study (n = 43) than statistically expected (n = 30.4), $\chi^2(3, N = 402) = 14.71$, $p = .002$, Cramer's $V = .191$.

Because race was not independent of primary drug or gender, a preliminary factorial ANOVA that included race was performed. There was not a statistically significant effect for race, nor race by primary drug 2-way interaction, nor race by gender 2-way interaction, nor race by primary drug by gender 3-way interaction. Therefore, race was not included in the final inferential analysis to test the hypotheses and answer the research questions. As noted in Table 12, Levene's test was significant, but the ratio of largest group variance to smallest group variance was within acceptable range to assume homogeneity of error variance ($.235^2$ divided by $.165^2 = 2.04$).

Factorial ANOVA Results

A 2 (gender) X 2 (primary drug) factorial ANOVA was conducted. Levene's test was significant, but the ratio of largest group variance to smallest group variance was within acceptable range to assume homogeneity of error variance ($.235^2$ divided by $.165^2 = 2.04$). Table 3 shows a between-subject analysis of gender and primary drugs that demonstrated the main effect of gender was not significant. Further analysis presented in

Table 4, showed males (1.242) and females (1.276) had relatively equal means on DRLOC. The main effect of primary drug was significant and the interaction was significant. The narcotic group had higher mean (1.358) for DRLOC scores than the stimulant group (1.159). Because the interaction was significant, it is invalid to solely rely on the main effects of gender and primary drug to understand differences on DRLOC scores. Instead, the focus needed to be on interpreting the interaction. As detailed in Table 4, and displayed in Figure 1, females in the narcotic group had higher DRLOC scores than males, but females in the stimulant group had lower DRLOC scores than males.

Table 3

Factorial ANOVA Results of Gender and Primary Drug on DRLOC Scores

Source	*SS*	*df*	*MS*	*F*	*p*	η_p^2
Gender	0.094	1	0.094	2.672	.103	.007
Primary drug	3.159	1	3.159	89.722	<.001	.184
Gender*Primary drug	0.380	1	0.380	10.806	.001	.026
Error	14.013	398	0.035			
Total	17.694	401				

Table 4

DRLOC Scores by Gender and Primary Drug

	Male			Female			Total		
Group	*N*	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*
Narcotic	65	1.31	.24	52	1.41	.23	117	1.35	.24
Stimulant	96	1.18	.16	189	1.14	.17	285	1.15	.17
Total	161	1.23	.21	241	1.20	.21	402	1.21	.21

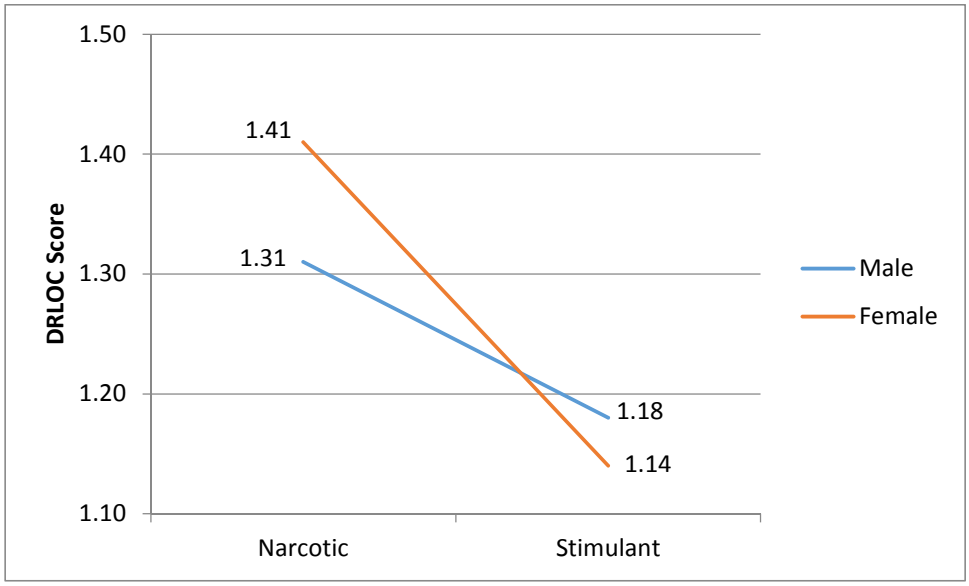

Figure 1. Interaction effect of gender and primary drug on DRLOC scores.

Summary

Archival data of 402 eligible cases were obtained from the UCLAs Integrated Substance Abuse Programs' Drug Treatment Process and Drug Treatment Counselor Practices and Effectiveness study. The 15-item DRLOC scale, the dependent variable, had a Cronbach's alpha of .816 and was within normal distribution parameters. Hispanics had higher DRLOC scores than Whites and African-Americans. African-Americans were overrepresented in the stimulant group and Hispanics were overrepresented in the narcotic group. Also, female African-Americans and male Hispanics were overrepresented. Despite the confounds around the race variable, a preliminary factorial ANOVA of race, gender, and primary drug found no significant main or interaction effects involving race, so it was excluded from further analysis. In the factorial ANOVA of gender and primary drug on DRLOC scores to test the hypotheses and answer the

research question, primary drug and the gender by primary drug interaction effects were significant. While, overall, the narcotic group had higher DRLOC scores than the stimulant group, the interaction manifested as females in the narcotic group having higher DRLOC scores than males, with females in the stimulant group having lower DRLOC scores than males.

Further interpretation and conclusion of the findings, social change implications and future considerations of potential implementation of the DRLOC instrument as part of the treatment process was discussed in chapter 5. To conclude, the limitations of this study and recommendations for future research with the DRLOC instrument were also presented in chapter 5.

Chapter 5: Discussion

Purpose Statement

The purpose of this study was to examine if narcotic or stimulant use among men and women effect the DRLOC score and to determine if it is useful to implement the DRLOC scale as an individualized instrument to be included in the treatment process. Implementing the DRLOC scale at the time of admission, during treatment, and toward the end of treatment could potentially help measure several outcomes, including the ability to measure patients' progress in treatment through personal awareness and shifts in thought processes and behaviors, or the lack thereof. Additionally, the DRLOC score could provide a reasonable understanding of the minimal progress achieved and determine the appropriate intervention needed that coincide with the patient's DRLOC score.

The focus of this study was to examine the effect gender and primary drug had on DRLOC. Conducting an extensive literature review, no recent research was discovered which focused on LOC and narcotics, LOC and stimulants, or LOC with narcotic and stimulants.

There were limited numbers of assessment tools used for measuring drug-related disorders and LOC. The original I-E LOC scale measured individuals' beliefs in whether they could control their consumption of alcohol and did not focus on drug abuse (Rotter & Mulry, 1965). Calicchia (1974) used the I-E LOC scale to measure LOC and heroin usage. Hall (2001) developed the DRLOC scale to focus specifically on drug abuse

among people in treatment programs. Ersche et al. (2012) studied the reliability of the DRLOC scale and reported the DRLOC scale to be an effective assessment tool for measuring LOC in people with substance use disorders.

The DRLOC scale consists of 15 forced choice items that give two statements for each item, which forces participants to choose one of the two statements identified as either A or B. Statement A equals one point and statement B equals two points. The 15 items measure LOC on a continuum from internal to external. After the participant complete the DRLOC scale, the interviewer adds the numbers circled by the participant. The numbers circled for items 1, 3, 5, 8, 11, 14, and 15 must be reverse coded. After recoding, the DRLOC score is computed by taking the mean score of all items. The total score is then divided by 15 (the total number of items on the scale) to get the mean score. A score that is closer to one represents a more internally controlled locus and a score that is closer to two indicates a more externally controlled locus.

The DRLOC scale was the latest LOC instrument in the field of social science. Hall's (2001) analysis of the DRLOC instrument found $\alpha = .81$. Hall measured internal consistency by applying Cronbach's alpha and the split-half procedure using the Spearman-Brown Prophecy formula. Hall explained the study was large and hindered the procedure for test-retest reliability and examined other measures to test convergent validity by examining correlations of scores. This included participants' DRLOC scores and Addiction Severity Index scores which were positively correlated ($r = .301$ $p < .00$). This demonstrated that high scores generated from the Addiction Severity Test (except

for the subscale Medical) correlated with a high score on the DRLOC. It should be noted that of the seven domains in the Addiction Severity Index scale (medical, employment, alcohol and drugs, legal, family and social relationships, and psychiatric) the subscale of alcohol and drugs demonstrated the highest correlations with a score of .283.

Participant Selection

The purpose of conducting a secondary analysis was to reexamine data on individuals who received treatment for their substance use disorder. Specifically, the purpose was to examine the main factorial effects of primary drug (narcotic vs. stimulant), gender (men vs. women), and their interaction. This was accomplished by re-examining secondary data generated by the UCLAs Integrated Substance Abuse Programs' Drug Treatment Process and Drug Treatment Counselor Practices and Effectiveness study. The sample size in the UCLAs study was 666 participants diagnosed with substance use disorders from 19 drug treatment programs. From the UCLAs Integrated Substance Abuse Programs' study, 553 participants agreed to participate in Hall's (2001) Feelings About Drug Use, DRLOC study. From Hall's study, 402 participants' data was used for the Effect Gender and Narcotic or Stimulant Abuse has on DRLOC study. Of the 402 participants, 285 reported their drug of choice to be stimulants and 117 reported their drug of choice to be narcotics.

The study consisted of 157 (39.1%) White, 135 (33.6%) were Black/African American, 16 (4%) were Asia/Pacific Islander, 5 (1.2%) were Native American, 76 (18.9%) were Hispanic, 10 (2.5%) were multiracial, and 2 (.5%) were identified as Other.

One participant's data was missing in the system and represented .2% of the 402 participants. The youngest participant was 19 and the oldest participant was 69 (M = 35.46, SD = 8.49). The median was 34. Skewness and Kurtosis were both less than 1.0 and within acceptable range of normal distribution with skewness at .690 and Kurtosis at .731.

Hall's (2001) report indicated the education level of those who participated in the UCLAs study averaged 12.2 years. The sample population for the Effect Gender and Narcotic or Stimulant Abuse has on DRLOC (Travis, 2018) study ranged from a minimum of 6 years and a maximum of 26 years of education. Years of education had a high kurtosis at 5.894 because one case reported 26 years; the next closest was 20. The outlier case was recoded to 20, which brought the distribution of the variable within acceptable normal range with kurtosis at 1.730 and Skewness at .678. Normal range is skewness less than the absolute value of 3 and kurtosis less than the absolute value of 7 (Kline, 2016). After recoding, the mean was 12.03, standard deviation was 2.25, and the median was 12.

In the case of household income, this variable was coded as range because it is an ordinal variable. The mean 3.4091 is not itself valid, but it was used to state that the average income was between $15,000 and $24,999. The minimum household income was under $10,000 and the maximum was over $200,000. There were 212 cases (53.5%) that had a household income under $10,000.

Research

The research question examined for this study was: To what extent do DRLOC scores differ by primary drug (narcotic vs. stimulant), gender (male vs. female), and their interaction?

N_01: There is no statistically significant difference ($p > .05$) in DRLOC scores between participants whose primary drug was a narcotic versus a stimulant.

N_a1: There is a statistically significant difference ($p < .05$) in DRLOC scores between participants whose primary drug was a narcotic versus a stimulant.

N_02: There is no statistically significant difference ($p > .05$) in DRLOC scores between males and females.

N_a2: There is a statistically significant difference ($p < .05$) in DRLOC scores between males and females.

N_03: There is no statistically significant interaction effect ($p > .05$) between primary drug and gender on DRLOC scores.

N_a3: There is a statistically significant interaction effect ($p < .05$) between primary drug and gender on DRLOC scores.

Screening of Demographics as Covariates or Confounds

The demographic variables, education level, socioeconomic status, age and race were screened as potential covariates or confounds. As a result of the screening, education level, socioeconomic status, and age did not demonstrate a direct influence or

had an effect on DRLOC scores. Therefore, the demographic variables were not included as a covariate in the primary analysis.

Race was recoded into 4 categories because some of the original categories had very small numbers of cases: White, African-American, Hispanic, all other. The "All Other" category includes Asian/Pacific Islander, Native American, and Multi-racial. Levene's Test of Equality of Error Variances was conducted to test the null hypothesis that the error variance of the dependent variable, DRLOC score, was equal across groups. Levene's test was significant, meaning the groups did not have equal variance. However, according to Tabachnick and Fidell (2007), if the ratio of the largest group variance to that of the smallest group variance is less than 10, than it is okay. In this case the ratio was 2.2 ($.248^2$ divided by $.168^2$).

Analysis of between-subjects demonstrated DRLOC scores do statistically significantly differ by race, $F(3, 398) = 7.07$, $p < .001$, eta squared = .05 (a medium size effect). Hispanics had higher DRLOC scores than both White and African American groups.

To further screen for race and its relationship with primary drug, further analysis showed there were more African Americans in the stimulant group ($n = 121$) than statistically expected ($n = 95.7$), and more Hispanics in the narcotic group ($n = 42$) than statistically expected ($n = 22.1$), $\chi^2(3, N = 402) = 49.51$, $p < .001$, Cramer's $V = .351$. There were more female African Americans in the study ($n = 94$) than statistically

expected (n = 80.9), and more male Hispanics in the study (n = 43) than statistically expected (n = 30.4), $\chi^2(3, N = 402) = 14.71$, p = .002, Cramer's V = .191.

Because race was not independent of primary drug or gender, a preliminary factorial ANOVA that included race was performed There was not a statistically significant effect for race, nor race by primary drug 2-way interaction, nor race by gender 2-way interaction, nor race by primary drug by gender 3-way interaction. Therefore, race was not included in the final inferential analysis to test the hypotheses and answer the research questions. As noted in Table 12, Levene's test is significant, but the ratio of largest group variance to smallest group variance was within acceptable range to assume homogeneity of error variance ($.235^2$ divided by $.165^2 = 2.04$).

Factorial ANOVA Results

A 2 (gender) X 2 (primary drug) factorial ANOVA was conducted. Levene's test was significant, but the ratio of largest group variance to smallest group variance were within acceptable range to assume homogeneity of error variance ($.235^2$ divided by $.165^2 = 2.04$). A between-subject analysis of gender and primary drugs that demonstrated the main effect of gender was not significant. Further analysis presented, showed males (1.242) and females (1.276) had relatively equal means on DRLOC. The main effect of primary drug was significant and the interaction was significant. The narcotic group had higher mean (1.358) for DRLOC scores than the stimulant group (1.159). Because the interaction was significant, it is invalid to solely rely on the main effects of gender and primary drug to understand differences on DRLOC scores. Instead, the focus needs to be

on interpreting the interaction. Females in the narcotic group had higher DRLOC scores than males, but females in the stimulant group had lower DRLOC scores than males.

Limitations of the Study

A limitation identified in the Feelings About Drug Use, DRLOC study derived from how the sample population was generated. Participants from the original study were populated through a stratified, random selection of patients from 19 different types of alcohol and drug treatment programs. Selecting narcotics and stimulants as variables in the Effect Gender and Narcotic or Stimulant Abuse has on DRLOC (Travis, 2018) study provided more consistency with drug treatment by excluding alcohol and other types of drug abuse from the data. However, treatment philosophies and length of treatment still presented limitations with consistency within the sample population.

Other limitations were reflected in reading and writing abilities of the participants with education levels ranging from a minimum of 6 years and a maximum of 26 years of education. Participant's education level in the Effect Gender and Narcotics or Stimulant Abuse has on DRLOC (Travis, 2018) study averaged 12 years of education.

Extraneous and confounding variables reflect biopsychosocial triggers in the environment, such as the possibility that participants could have been under the influence of drugs during the study. The influences of foreign chemicals introduced into the body have an effect on behaviors and thought processes (APA, 2013) and could affect the response given to questions on the DRLOC instrument.

Recommendations

The focus of the Effect Gender and Narcotics or Stimulant Abuse has on DRLOC (Travis, 2018) study was to examine if narcotic or stimulant use among men and women affect the DRLOC score, if gender affects the DRLOC score, and if the interactions between drug use and gender is significant. It is recommended, from the results of the Effect Gender and Narcotics or Stimulant Abuse has on DRLOC (Travis, 2018) study, that the DRLOC scale, as a viable instrument for measuring drug-related LOC and interactions between drug use and gender, be included as part of a program's treatment protocol.

Individualize treatment is needed due to gender differences as referenced by the scores and specific drugs use reflected in the Effect Gender and Narcotics or Stimulant Abuse has on DRLOC (Travis, 2018) study, which demonstrated males in the narcotic group had lower DRLOC scores than females, but males in the stimulant group had higher DRLOC scores than females. The results of DRLOC scores validates there are differences related to gender and primary drug abuse (Shannon et al., 2014) and differences in patterns of drug use (Lev-Ran et al., 2013; Samuelsson, 2015).

Administering the DRLOC scale at admittance into treatment programs, during treatment, and at discharge from a program is recommended and could help to measure patient's thought processes and behaviors related to drug activities throughout treatment. Administrating the DRLOC scale at the beginning of treatment could also help in predicting patient's willingness to fully engage in treatment (Page and Scalora, 2004),

which would allow practitioners to meet patients where they are in their stage of change toward recovery. The DRLOC score could also help in determining which evidence-based treatment fits the individual's needs and whether or not this intervention worked. When treatment programs implement the DRLOC scale as part of the treatment process, admittance score that represents External-LOC at the beginning of treatment and shifts to Internal-LOC at end of treatment would demonstrate effective interventions, while a score from Internal-LOC to External-LOC would demonstrate ineffective interventions (Page and Scalora, 2004).

Further recommendation for a longitudinal study looking at gender, primary drug of choice, DRLOC scores obtained throughout treatment, and a specific evidence-based intervention to determine if DRLOC scores could measure shifts in behaviors and thought progress is needed. For example, administering the DRLOC in specific treatment programs, such as methadone maintenance treatment programs, where a sample population identifies narcotics as their primary drug of choice, and where each patient is being provided methadone as part of the treatment protocol, can serve as the next step for examining the effectiveness of the DRLOC scale and its importance in the field of addiction and treatment protocol.

Social Implications

The Effect Gender and Narcotic or Stimulant Abuse has on DRLOC (Travis, 2018) study demonstrated the importance of understanding the interaction between gender and primary drugs influence on LOC. Social implications for practitioners

becoming awareness of this interaction would be helpful with treatment. Social implications for treatment programs that administer the DRLOC scale could be beneficial for measuring treatment success on the part of the practitioners and patient. Clinicians in multiple human service fields and community organizations could benefit by knowing a patient's DRLOC score and then align the score with appropriate evidence-based interventions (National Registry of Evidence-based Programs and Practices, 2016).

Social implication for utilizing the DRLOC score to educate patients about their LOC could help patients become aware of their behavior and thought processes. Patients could gain a better understanding of how their ongoing drug use is connected to how they view their current situation and prior experiences in life and what might be their triggers. This knowledge of understanding how drug use and LOC are connected to triggers could help patients develop coping skills to recognize and resist triggers for a better quality of life.

Social implications for utilizing a DRLOC instrument for both professionals and patients would help to minimize stigma in treatment settings. Practitioners who administer a LOC instrument as part of family therapy with each family member could see amongst family members a better understanding of a loved one's addictive behaviors and levels of control when each family member is aware of their own LOC and how this impacts their interactions with others (Foon, 1986). Being aware of one's LOC score may help family members change their perception and the stigma associated with addictions (Foon, 1986) once they understand their love one's DRLOC score.

Social implications may extend to the general public becoming better educated about LOC by understanding their personal score could help the public recognize their thought processes associated with their decision making and daily responses to events and situations. This recognition of how LOC impacts every person's behavior could result in positive shifts in how the public view and treat people with a substance use disorder and their DRLOC scores.

Conclusion

The results of the Effect Gender and Narcotics or Stimulant Abuse has on the DRLOC (Travis, 2018) study, in which a majority of participants were identified as stimulant users, coincide with the research conducted in the addiction field. CDADP (2013) found Methamphetamine was the most commonly reported primary drug of choice in the state, at a rate 13% higher than heroin, and admission rates of 48,345 patients into treatment for stimulant abuse were higher compared to 38,785 admissions for narcotic abuse (SAMHSA, 2016d). These statistics underscore a need to understand the importance of structuring treatment with evidence-based interventions by first identifying what the individualized needs are for the patient. The Effect Gender and Narcotics or Stimulant Abuse has on the DRLOC (Travis, 2018) study demonstrated the importance of identifying a patient's DRLOC score in order to select the best treatment intervention for the individual.

A more important understanding of gender is needed when treating patients. Conflicting ideologies of treating all men and women as equal, compared to addressing

gender-specific needs, is a dilemma for some treatment programs because men and women are different biopsychosocially (Lev-Ran et al., 2013; Samuelsson, 2015). As demonstrated in the Effect of Gender and Narcotics or Stimulant Abuse has on the DRLOC (Travis, 2018), DRLOC scores related to gender bared no significant difference. However, when examining the interaction between gender and primary drug of choice, significant differences occurred. The results support the importance of men and women who used narcotics or stimulants benefiting from learning their DRLOC score and being provided with evidence-based treatment that addresses their specific drug of choice, thought processes, and behaviors.

If administered throughout the treatment process, the DRLOC instrument could potentially help measure several outcomes: The ability to measure patient's progress throughout treatment through personal awareness and shifts in thought processes and behaviors, or the lack thereof. It could provide a reasonable understanding of the minimal progress achieved. Most important, the DRLOC instrument could determine the appropriate interventions needed that coincide with the patient's LOC score.

In closing, the practice of administering the DRLOC instrument at the beginning of treatment, during treatment, and at the end of treatment (Pasareanu et al., 2015) should be part of the treatment protocol along with appropriate patient-centered, evidence-based interventions that meet the needs of the individual.

References

Altamirano, L. J., Fields, H. L., D'Esposito, M.D., & Boettiger, C. A. (2011). Interaction between family history of alcoholism and LOC in the opioid regulation of impulsive responding under the influence of alcohol. *Alcoholism: Clinical and Experimental Research, 5*(11), 1905-1914. doi:10.1111/j1530-0277.2011.01535.x

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text revision). Washington, DC: Author.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.

Baird, C. (2015). Role of medication in the treatment of opioid use disorders. *Journal of Addictions Nursing, 26*(4), 213-216. doi:10.1097/JAN.0000000000000101

Banta-Green, C. J., Maynard, C., Koepsell, T. D., Wells, E. A., & Donovan, D. M. (2009). Retention in methadone maintenance drug treatment for prescription-type opioid primary users compared to heroin users. *Society for the Study of Addiction, 104*, 775-783. doi:10.1111/j.1360-0443.2009.02538.x

Bao, Y., Liu. Z., Epstein, D. H., Du, C., Shi, J., & Lu, L. (2009). A meta-analysis of retention in methadone maintenance by dose and dosing strategy. *American Journal of Drug and Alcohol Abuse, 35*, 28-33. doi:10.1080/00952990802342899

Berridge, K. C., & Robinson, T. E., (2016). Liking, wanting, and the incentive-sensitization theory of addiction. *American Psychologist, 71*(8), 670-679. doi:10.1037/amp0000059

Berzins, J. I., & Ross, W. E. (1973). Locus of control among opiate addicts. *Journal of Consulting and Clinical Psychology, 40*(1), 84-91. doi:10.1037/h0034004

Bornovalova, M. A., Daughters, S. B., Hernandez, G. D., Richards, J. B., & Lejuez, C. W. (2005). Differences in impulsivity and risk-taking propensity between primary users of crack cocaine and primary users of heroin in a residential substance-use program. *Experimental and Clinical Psychopharmacology, 13*(4), 311-318. doi:10.1037/1064-1297.13.4.311

Bright, S. J., Kane, R., Marsh, A., & Bishop, B. (2013). Psychometric properties of the locus of control of behaviour scale (LCBS) among Australians seeking alcohol and other drug (AOD) treatment. *Australian Psychologist, 48*, 172-177. doi:10.1111/j.1742-9544.2010.00094.x

Bristow-Braitman, A. (1995). Addiction recovery: 12-step programs and cognitive-behavioral psychology. *Journal of Counseling & Development, 73*, 414-418. doi:10.1002/j.1556-6676.1995.tb01774.x

Buckland, P. R. (2008). Will we ever find the genes for addiction? *Society for the Study of Addiction, 103*, 1768-1776. doi:10.111/j.1360-0443.2008.02285.x

Caan, W. (2012). Defining addiction, with more humanity. *Contemporary Social Science, 7*(2), 159-165. doi:10.1080/21582041.2012.683577

Cabriales, J. A., Cooper, T. V., & Taylor, T. (2013). Prescription drug misuse, illicit drug use, and their potential risk and protective correlates in a Hispanic college student

sample. *Experimental and Clinical Psychopharmacology, 21*(3), 235-244. doi:10.1037/a0031973

Calicchia, J. P. (1974). Narcotic addiction and perceived locus of control. *Journal of Clinical Psychology, 30*(4), 499-504. doi:10.1002/1097-4679(197410)30:4<499:aid-jclp2270300413>3.0.co;2-8

California Department of Alcohol and Drugs Program. (2013). Californians in treatment report: State fiscal year 2011-2012. *Office of Applied Research and Analysis*. Retrieved from http//www.adp.ca.gov/OARA/pdf/Californians-in-Treatment-Report.pdf

Campbell, D. T. & Stanley, J. C. (1963). *Experimental and quasi-experimental designs for research.* Boston: Houghton Mifflin Company.

Carlson, B. E., & Larkin, H. (2009). Meditation as a coping intervention for treatment of addiction. *Journal of Religion & Spirituality in Social Work: Social Thought, 28*, 379-392. doi:10.1080/15426430903263260

Caselles, A., Mico, J. C., & Amigo, S. (2010). Cocaine addiction and personality: A mathematical model. *British Journal of Mathematical and Statistical Psychology, 63*, 449-480. doi:10.1348/000711009X470768

Center for Behavioral Health Statistics and Quality. (2015). Behavioral health trends in the United States: *Results from the 2014 national survey on drug use and health.* HHS Publication No. SMA 15-4927, NSDUH Series H-50, Retrieved from http://www.samhsa.gov/data/

Centers for Disease Control and Prevention. (2016). *Injury prevention and control: Opioid overdose: Drug overdose deaths in the United States hit record numbers in 201.,* Retrieved from http://www.cdc.gov/drugoverdose/epidemic/index.html

Chen, G. (2009). Gender differences in crime, drug addiction, abstinence, personality characteristics, and negative emotions. *Journal of Psychoactive Drugs, 41*(3), 255-266. doi:10.1080/02791072.2009.10400536

Choi, S., Adams, S. M., Morse, S. A., & MacMaster, S. (2015). Gender differences in treatment retention among individuals with co-occurring substance abuse and mental health disorders. *Substance Use & Misuse, 50,* 653-663. doi:10.3109/10826084.2014.997828.

Coffey, S. F., Schumacher, J. A., Baschnagel, J. S., Hawk, L. W., & Holloman, G. (2011). Impulsivity and risk-taking in borderline personality disorder with and without substance use disorder. *Personality Disorders: Theory, Research, and Treatment, 2*(2), 128-14. doi:10.1037/a0020574

Congdon, E., & Canli, T. (2008). A neurogenetic approach to Impulsivity. *Journal of Personality, 76*(6), 1447-1484. doi:10.1111/j.1467-6494.2008.00528.x

Connolly, S. G. (1980). Changing expectancies: A counseling model based on locus of control. *Personnel & Guidance Journal, 59*, 176-180. Retrieved from http:/www.counseling.org/publications

Cox Jr., W. R. & Luhrs, J. A. (1978). Relationship between locus of control and alcohol and drug-related behaviors in teenagers. *Social Behavior and Personality, 6*(2), 191-194. Retrieved from http://www.sbp-journal.com/

Cummins, L. F., Nadorff, M. R., & Kelly, A. E. (2009). Winning and positive affect can lead to reckless gambling: *Psychology of Addiction Behaviors, 23*(2), 287-294. doi:10.1037/a0014783

Cyders, M. A., Smith, G. T., Spillane, N. S., Fischer, S., Annus, A. M., & Peterson, C. (2007). Integration of impulsivity and positive mood to predict risky behavior: Development and validation of a measure of positive urgency. *Psychological Assessment, 19*(1), 107-118. doi:10.1037/1040-3590.19.1.107

Davidson, L., Andres-Hyman, R., Bedregal, L., Tondora, J., Fry, J., & Kirk, T. A. (2008). From "double trouble" to "dual recovery": Integrating models of recovery in addiction and mental health. *Journal of Dual Diagnosis, 4*(3), 273-290. doi:10.80/15504260802072396

Davis, C. G., Doherty, S., & Moser, A. E. (2014). Social desirability and change following substance abuse treatment in male offenders. *Psychology of Addictive Behaviors, 28*(3), 872-879. doi:10.1037/a0037528

Deming, A. M., & Lochman, J. E. (2008). The relation of LOC, anger, and impulsivity to boys' aggressive behavior. *Behavioral Disorders, 33*(2), 108-119. Retrieved from http://www.ccbd.net

DiClemente, C. C. (2003). *Addiction and change: Understanding initiation and promoting recovery*, New York, NY: Guilford Press

Donovan, D. M., & O'Leary, M. R. (1978). The drinking-related locus of control scale: Reliability, factor structure and validity. *Journal of Studies on Alcohol, 39*(5), 759-784.

Drug Enforcement Administration. (2013). *Drugs of abuse, 2011 edition: A DEA resource guide.* United States Department of Justice, Retrieved from http://www.justice.gov/dea/druginfo/factsheets.shtml

Erickson, C. K., & White, W. L. (2009). The neurobiology of addiction recovery. *Alcoholism Treatment Quarterly, 27*, 338-345. doi:10.1080/07347320903014255

Ersche, K. D., Turton, A. J., Croudace, T., & Stochl, J. (2012). Who do you think is in control in addiction? A pilot study on drug-related LOC beliefs. *Addiction Disorders and Their Treatment, 11*(4), 173-223. doi:10.1097/ADT.0b013e31823da151

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*, 175-191. doi:10.3758/bf03193146

Foon, A. E. (1986). Effect of locus of control on counseling expectations of clients. *Journal of Counseling Psychology, 33*(4), 462-464. doi:10.1037/0022-0167.33.4.462

Forte, A. (2005). LOC and the moral reasoning of managers. *Journal of Business Ethics, 58*, 66-77. doi:10.1007/s10551-0051387-6

George, D., & Mallery, P. (2010). *SPSS for windows step by step: A simple guide and reference. 17.0 Update* (10th ed.). Boston, MA: Pearson.

Gifford, E., & Humphreys, K. (2007). The psychological science of addiction. *Society for the Study of Addiction, 102*, 352-361. doi:10.1111/j.1360.0443.2006.01706.x

Grant, J. E., Potenza, M. N., Weinstein, A., & Gorelick, D. A. (2010). Introduction to behavioral addictions. *American Journal of Drug and Alcohol Abuse, 36*, 233-241. doi:10.3109/00952990.2010.491884

Green., C. A., (2006). Gender and use of substance abuse treatment services. *Alcohol Research and Health, 29*(1), 55-62. Retrieved from http://web.a.ebscohost.com.ezp.waldenulibrary.org/ehost/pdfviewer/pdfviewer?sid=c10e9a56-2539-4315-a652-62f22b976ae3%40sessionmgr4008&vid=29&hid=4204

Haile, C. N., Kosten, T. A., & Kosten, T. R. (2008). Pharmacogenetic treatments for drug addiction: Alcohol and opiates. *American Journal of Drug and Alcohol Abuse, 34,* 355-381. doi: 10.1080/009599080122564

Hall, E. A. (2001). *Feelings about drug use: Drug-related locus of control.* Criminal Justice Research Group: Integrated Substance Abuse Programs. Semel Institute of Neuroscience and Human Behavior, University of California, Los Angeles.

Retrieved from http://www.uclaisap.org/cjs/assets/docs/D-R LOC_scale_instrumentation.pdf

Haseltine, F. P. (2000). Gender differences in addiction and recovery. *Journal of Women's Health & Gender-Based Medicine 9*(6). 579-583. doi:10.1089/15246090050118080

Hatgis, C., Friedmann, P. D., & Wiener M. (2008). Attributions of responsibility for addiction: The effects of gender and type of substance. *Substance Use & Misuse 43*(5), 700-708. doi:10.1080/10826080701202734

Hattrup, K., O'Connell, M. S., & Labrador, J. R. (2005). Incremental validity of LOC after controlling for cognitive ability and conscientiousness. *Journal of Business and Psychology, 19*(4), 461-481. doi:10.1007/s10869-005-4519-1

Heidbreder, C. (2008). Selective antagonism at dopamine D3 receptors as a target for drug addiction pharmacotherapy: A review of preclinical evidence. *Central Nervous System & Neurological Disorders-Drug Targets, 7*, 410-421. doi:10.2174/187152708786927822

Heidbreder, C. A., & Newman, A. H. (2010). Current perspectives on selective dopamine D3 receptor antagonists as pharmacotherapeutic for addictions and related disorders. *Annals of the New York Academy of Sciences, 1187*, 4-34. doi:10.1111/j.1749-6632.2009.05149.x

Hogarth, L. (2011). The role of impulsivity in the etiology of drug dependence: Reward sensitivity versus automaticity. *Psychopharmacology, 215*, 567-580. doi:10.1007/s00213-011-2172-0

Jeansonne, A. (2002). *Loglinear Models.* Retrieved from http://userwww.sfsu.edu/efc/classes/biol710/loglinear/Log%20Linear%20Models.htm

Kang, S. & Deren, S. (2009). Factors mediating and moderating the relationship between gender and utilization of health care among Puerto Rican drug users in New York. *Drug and Alcohol Dependence, 102*, 138-143. Doi:10.1016/j.drugalcdep.2009.02.011

Karim, R. & Chaudhri, P. (2012). Behavioral addiction: An overview. *Journal of Psychactive drugs, 44*(1), 5-17. doi:10.1080/02791072.2012.662859

Keller, J. & Blomann, F. (2008). Locus of control and the flow experience: An experimental analysis. *European Journal of Personality 22*, 589-607. doi:10.1002/per.692

Keyson, M., & Janda, L. (1972). The internal-external scale for alcoholism. Unpublished manuscript, St. Luke's Hospital, Phoenix, AZ

Kirschenbaum, H. & Jourdan, A. (2005). The current status of Carl Rogers and the person-centered approach. *Psychotherapy: Theory, Research, Practice, Training, 42*(1), 37-51. doi:10.1037/0033-3204.42.1.37

Kline, R. B. (2016). Principles and practice of structural equation modeling (4th ed.).

New York NY: Guilford Press.

Kreek, M. J., Nielsen, D. A., Butelman, E. R., & LaForge, S. (2005). Genetic influences on impulsivity, risk taking, stress responsively, and vulnerability to drug abuse and addiction. *Nature Neuroscience, 8*(11), 1450-1457. doi:10.1038/nn1583

Kulesza, M., Matsuda, M., Ramirez, J. J., Werntz, A. J., Teachman, B. A., & Lindgren, K. P. (2016). Towards greater understanding of addiction stigma: Intersectionality with race/ethnicity and gender. *Drug and Alcohol Dependence, 169*, 85-91. doi:10.1016/j.drugalcdep.2016.10.020

Lam, D., & Mizerski, D. (2005). The effects of LOC on word-of mouth communication. *Journal of Marketing Communications, 11*(3), 215-228. doi:10.1080/1352726042000333180

Larkin, M., Wood, R. T. A., & Griffiths, M. D. (2006). Towards addiction as relationship. *Addiction Research and Theory, 14*(3), 207-215. doi:10.1080/1606635050015747

Leeman, R. F. & Potenza, M. N. (2013). A targeted review of the neurobiology and genetics of behavioral addictions: An emerging area of research. *The Canadian Journal of Psychiatry, 28*(5), 260-273. doi:10.1177/070674371305800503

Lefcourt, H. M. (1966). Internal versus external control of reinforcement: A review. *Psychological Bulletin, 65*(4), 206-220. doi:10.1037/h0023116

Lefcourt, H. M. (1992). Durability and impact of the LOC construct. *Psychological Bulletin, 112*(3), 411-414. doi:10.1037/0033-2909.112.3.411

Lefcourt, H. M., Von Baeyer, C. L., Ware, E. E., & Cox, D. J. (1979). The multidimensional-multiattributional causality scale: The development of a goal specific locus of control scale. *Canadian Journal of Behavioural Science, 11*(4), 286-304. doi:10.1037/h0081598

Lev-Ran, S., Le Strat, Y., Imtiaz, S., Rehm, J., & Le Foll, B. (2013). Gender differences in prevalence of substance use disorders among individuals with lifetime exposure to substances: Results from a large representative sample. *The American Journal on Addictions, 22*, 7-13. doi:10.1111/j.1521-0391.2013.00321.x

Levran, O., Londono, D., O'Hara, K., Randesi, M., Rotrosen, J., Casadonte, P…& Kreek, M.J. (2009). Heroin addiction in African Americans: A hypothesis-driven association study. *Genesm Braun and Behavior, 8*, 531-540. doi:10.1111/j.1601-183X.2009 .00501.x

Littrell, J. (2010). Perspectives emerging from neuroscience on how people become addicted and what to do about it. *Journal of Social Work Practice in the Addictions, 10*, 229-256. doi:101.1080/1533256X.2010.498741

Lubman, D. I., Yucel, M., & Pantelis, C. (2004). Addiction, a condition of compulsive behaviour: Neuroimaging and neuropsychological evidence of inhibitory dysregulation. *Society for the Study of Addiction, 99*, 1491-1502. doi:10.1111/j.1360-0443.2004.00808.x

Mahmood, S. T., Vaughn, M. G., Mancini, M., & Fu, Q. J. (2013). Gender disparity in utilization rates of substance abuse services among female ex-offenders: A

population-based analysis. *American Journal of Drug and Alcohol Abuse, 39*(5), 332-339. doi:10.3109/00952990.2013.820732

Marshall, G. N., Collins, B. E., & Crooks, V. C. (1990). A comparison of two multidimensional health LOC instruments. *Journal of Personality Assessment, 54*(1&2), 181-190. doi:10.1207/s15327752jpa5401&2_18

McAnena, C., Craissati, J., & Southgate, K. (2016). Exploring the role of locus of control in sex offender treatment. *Journal of Sexual Aggression, 22*(1), 95-106. doi:10.1080/13552600.2015.1023374

McLachlan, A.D. & Starkey, N.J. (2012). The classification of substance and behavioral addictions: A preliminary investigation. *New Zealand Journal of Psychology, 41*(1), 7-18. Retrieved from http://www.psychology.org.nz1

McNeese-Smith, D. K., Wickman, M., Nyamathi, A., Kehoe, P., Earvolino-Ramirez, M., Robertson, S.,...Obert, J. (2009). Gender and ethnicity group differences among substance abuse treatment clients insured under managed care. *Journal of Addictions Nursing, 20,* 185-202. doi:10.3109/10884600903078969

Mennis, J., Stahler, G. J., & Baron, D. A. (2012). Geographic barriers to community-based psychiatric treatment for drug-dependent patients. *Annuls of the Association of American Geographers*, *102*(5), 1093-1103. doi:10.1080/00045608.2012.657142

Morgen, K., Denison-Vesel, K., Kobylarz, A., & Voelkner, A. (2015). Prevalence of substance use disorder treatment facilities specializing in older adult and trauma

care: N-SSATS data 2009-2011. *Traumatology, 21*(3), 153-160. doi:10.1037/trm0000038

National Institute on Drug Abuse. (2008). *An individual drug counseling approach to treat cocaine addiction*: Chapter 6-The individual drug counseling model. Retrieved from http://www.drugabuse.gov

National Institute on Drug Abuse. (2014). *Drugs, brains, and behaviors: The science of addiction*. National Institute of Health, NIH Publication No. 14-5605, U.S. Department of Health and Human Services. Retrieved from http://www.drugabuse.gov

National Registry of Evidence-based Programs and Practices. (2016). *Evidence-based interventions.* Retrieved from http://nrepp.samhsa.gov/AdvancedSearch.aspx

Nelson-Zlupko, L., Fauffman, E., & Dore, M. M. (1995). Gender differences in drug addiction and treatment: Implications for social work interventions with substance-abusing women. *Social Work 40*(1), 45-54. doi:10.1093/sw/40.1.45

Neto, R. D. A., & True, M. (2011). The development and treatment of impulsivity. *PSICO, Porto Alegre, PUCRS, 42*(1), 134-141. Retrieved from http://revistaseletronicas.pucrs.br/ojs/index.php/revistapsico

Niehaus, J. L., Cruz-Bermudez, N. D., & Kauer, J. A. (2009). Plasticity of addiction: A mesolimbic dopamine short-circuit? *American Journal on Addictions, 18*, 259-271. doi:10.1080/10550490902925946

Nielsen, D.A., Ji, F., Yuferov, V., Ho, A., Chen, A., Levran, O., Ott, J., & Kreek, M. J. (2008). Genotype patterns that contribute to increased risk for or protection from developing heroin addiction. *Molecular Psychiatry, 13*, 417-428. doi:10.1038/sj.mp.4002147

Norcross, J. C., Krebs, P. M., & Prochaska, J. O. (2011). Stages of change. *Journal of Clinical Psychology, 67*(2), 143-154. doi:101002/jclp.20758

Page, G. L., & Scalora, M. J. (2004). The utility of locus of control for assessing juvenile amenablity to treatment. *Aggression and Violent Behavior, 9*(5), 523-534. doi:10.1016/S1359-1789(03)00047-8

Pannells, T. C. & Claxton, A. F. (2008). Happiness, creative ideation, and LOC. *Creativity Research Journal, 20*(1), 67-71. doi:10.1080/10400410701842029

Pasareanu, A. R., Opsal, A., Vederhus, J., Kristensen, Ø., & Clausen, T. (2015). Quality of life improved following in-patient substance abuse disorder treatment. *Healthy and Quality of Life Outcomes, 13*(35)*,* 1-8, doi:10.118/s12955-015-0231-7

Prochaska, J. O., Norcross, J. C. (2001). Stages of change. *Psychotherapy, 38*(4), 443-448. doi:10.1037/0033-3204.38.4.443

Roderique-Davies, G., & Shearer, D. (2010). Estimated lifetime drug use, impulsivity, and psychopathology in recreational ecstasy users. *Journal of Substance Use, 25*(3), 215-225. doi:10.3109/14659890903271616

Rogers, C. R. (1992). The necessary and sufficient conditions of therapeutic personality changes. *Journal of Consulting and clinical Psychology, 60*(6), 827-832. doi:10.1037/0033-3204.44.3.240

Rollins, J. A. (2016). Heroin addiction: Not a laughing matter. *Pediatric Nursing, May-June, 42*(3), 109-111. Retrieved from https://www.pediatricnursing.net/

Rosenberg, H., & Phillips K. T. (2003). Acceptability and availability of harm-reduction interventions for drug abuse in American substance abuse treatment agencies. *Psychology of Addictive Behaviors, 17*(3), 203-210. doi:10.1037/0893-164X.17.3.203

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs: General and Applied, 80*(1), 1-28. doi:10.1037/h0092976

Rotter, J. B. (1975). Some problems and misconceptions related to the construct of internal versus external control of reinforcement. *Journal of Consulting and Clinical Psychology, 43*(1), 56-67. doi:10.1037/h0076301

Rotter, J. B. (1990). Internal versus external control of reinforcement: A case history of a variable. *American Psychologist, 45*(4), 489-493. doi:10.1037//0003-066x.45.4.489

Rotter, J. B., & Mulry, R. C. (1965). Internal versus external control of reinforcement and decision time. *Journal of Personality and Social Psychology, 2*(4), 598-604. doi:10.1037/0003-066X.45.4.489

Samuelsson, E. (2015). Substance use and treatment needs: Constructions of gender in Swedish addiction care, *Contemporary Drug Problems, 42*(3), 189-208. doi:10.1177/0091450915592912.

Schmitz, J. M. (2005). The interface between impulse-control disorders and addictions: Are pleasure pathway responses shared neurobiological substrates. *Sexual Addiction & Compulsivity,12*, 149-168. doi:10.1080/ 10720160500203641

Scimeca, M. M., Savage, S. R., Portenoy, R., & Lowinson, J. (2000). Treatment of pain in methadone-maintained patients. *Mount Sinai Journal of Medicine, 67*(5&6), 412-422. Retrieved from https://en.wikipedia.org/wiki/Mount_Sinai_Journal_of_Medicine

Shannon, L. M., Jackson, A., Perkins, E., & Neal, C. (2014). Examining gender differences in substance use, participant characteristics, and treatment outcomes among individuals in drug court. *Journal of Offender Rehabilitation, 53,* 455-477. doi:10.1080/10509674.2014.931747.

Sheffer, C., MacKillop, J., McGeary, J., Landes, R., Carter, L., Yi, R., …Bickel, W. (2012). Delay discounting, LOC, and cognitive impulsiveness independently predict tobacco dependence treatment outcomes in highly dependent, lower socioeconomic group of smokers. *The American Journal on Addictions, 21*, 221-232. doi:10.1111/j.1521-0391:2012.00224.x

Shor, R. & Levit, S. (2012). Persons with drug addiction as knowledge providers: Their contribution to social work education. *Journal of Teaching in Social Work, 32*, 190-203. doi:10.1080/08841233.2012.667749

Skinner, B. F. (1976). The question of control. In B. F. Skinner, *About behaviorism* (pp. 208-227). New York, NY: Vintage Books. Originally published 1974, by Alfred A. Knopf Inc.

Smith, P. B., Trompenaars, F., & Dugan, S. (1995). The Rotter LOC scale in 43 countries: A test of cultural relativity. *International Journal of Psychology, 30*(3), 377-400. doi:10.1080/00207599508246576

Spear, S., Crèvecoeur, D., Rawson, R. & Clark, R. (2007). The rise in methamphetamine use among American Indians in Los Angeles County. *American Indian and Alaska Native Mental Health Research: The Journal of the National Center, 14*, 1-15. Retrieved from http://files.eric.ed.gov/fulltext/EJ775486.pdf

Stanforth, E. T., Kostiuk, M., & Garriott, P. O. (2016). Correlates, of engaging in drug distribution in a national sample. *Psychology of Addictive Behaviors, 30*(1), 138-146. doi:10.1037/adb0000124

Statistics Laerd. (2014). Crosstabulation and loglinear regression. Retrieved from statistics.leard.com

Steingrimsson, S., Carlsen, H. K., Sigfusson, S., Magnusson, A. (2012). The changing gender gap in substance use disorder: A total population-based study of

psychiatric in-patients. *Addiction, 107*, 1957-1962. doi:10.1111/j.1360-0443.2012.03954.x

Substance Abuse and Mental Health Services Administration. (2009). *Addiction counseling competencies: The knowledge, skills, and attitudes of professional practices.* Technical Assistance Publication (TAP) Series 21. Retrieved from http://www.samhsa.gov

Substance Abuse and Mental Health Services Administration. (2012). Center for Behavioral Health Statistics and Quality. *National admissions to substance abuse treatment services*. *Treatment Episode Data Set (TEDS): 2000-2010.* DASIS series S-61, HHS publication no. (SMA) 12-4671. United States Department of Health and Human Services, Rockville, MD: Retrieved from http://www.samhsa.gov/data/2k12/TEDS2010N/TEDS2010NWeb.pdf

Substance Abuse and Mental Health Services Administration. (2013a). *Behavioral Health Barometer: California, 2013.* HHS Publication No. SMA-13-4796CA. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2013.

Substance Abuse and Mental Health Services Administration, (2013b). *2011 Opioid Treatment Program Survey: Data on Substance Abuse Treatment Facilities with OTPs.* BHSIS Series S-XX, HHS Publication No. (SMA) XX-XXX. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2013.

Substance Abuse and Mental Health Services Administration (2015). *Behavioral Health Barometer: California, 2015*. HHS Publication No. SMA–16–Baro–2015–CA. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2015. Retrieved from https://www.samhsa.gov/data/sites/default/files/2015_California_BHBarometer.pdf

Substance Abuse and Mental Health Services Administration. (2016a). *Alcohol, tobacco, and other drugs.* Retrieved from http://www.samhsa.gov/atod/opioids

Substance Abuse and Mental Health Services Administration. (2016b). Center for Behavioral Health Statistics and Quality. *Treatment Episode Data Set (TEDS): 2004-2014. National Admissions to Substance Abuse Treatment Services.* BHSIS Series S-84, HHS Publication No. (SM) 16-4986. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2016. Retrieved from http://www.samhsa.gov/atod/opioids

Substance Abuse and Mental Health Services Administration. (2016c). Center for Behavioral Health Statistics and Quality. *Treatment Episode Data Set (TEDS): 2004-2014 National Admissions to Substance Abuse Treatment Services.* BHSIS Series S-84, HHS Publications No. (SMA) 16-4986. Rockville, MD: Substance Abuse and Mental Health Services Administration. Retrieved from https://wwwdasis.samhsa.gov/dasis2/teds_pubs/2014_teds_rpt_natl.pdf

Substance Abuse and Mental Health Services Administration. (2016d). Center for Behavioral Health Statistics and Quality. *Treatment Episode Data Set (TEDS): 2004-2014. State Admissions to Substance Abuse Treatment Services.* BHSIS Series S-85, HHS Publications No. (SMA) 16-4987. Rockville, MD: Substance Abuse and Mental Health Services Administration. Retrieved from https://wwwdasis.samhsa.gov/dasis2/teds_pubs/2014_teds_rpt_st.pdf

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics (5th ed.).* Boston, MA,: Allyn & Bacon/Pearson Education.

Travis, Y.R. (2018). The effect gender and narcotic or stimulate abuse has on drug-related locus of control. (Unpublished doctoral dissertation). Walden University, Minneapolis, Minnesota.

United Nations Office on Drugs and Crime. (2015a). *Drug use and its health and social consequences.* Retrieved from http://www.unodc.org/wdr2014/en/drug-use.html

United Nations Office on Drugs and Crime. (2015b). *Opiates.* Retrieved from http://www.unodc.org/wdr2014/en/opiates.html

Vohs, K. D., & Baumeister, R. F. (2009). Addiction and free will. *Addiction Research and Theory, 17*(3), 231-235. doi:10.1080/16066350802567103

Watson, J. B. (1970). Personality: Presenting the thesis that our personality is but the outgrowth of the habit we form. In J. B. Watson, *Behaviorism:* (pp. 269-304). New York, NY: W.W. Norton & Company, Inc. Originally published 1924, by the People's Institute Publishing Company, Inc.

Webb, T. L., Sniehotta, F. F., & Michie, S. (2010). Using theories of behavior change to inform interventions for addictive behaviours. *Society for the Study of Addiction, 105*,1879-1892. doi:10.1111/j.1360-0443.2010.03028.x

Weissbach, T. A., Vogler, R. E., & Compton, J. V. (1976). Comments on the relationship between locus of control and alcohol abuse. *Journal of Clinical Psychology, 3*2(2), 484-486. doi:10.1002/1097-4679(197604)32:2<484aid-jclp2270320261>3.0.co;2-m

Whiteside, S. P., & Lynam, D. R. (2001). The five-factor model and impulsivity: Using a structural model of personality to understand Impulsivity. *Personality and Individual Differences, 30,* 669-689. doi:10.1016/S0191-8869(00)00064-7

Worley, M. J., Heinzerling, K. G., Shoptaw, S. M., & Ling, W. (2015). Pain volatility and prescription opioid addiction treatment outcomes in patients with chronic pain. *Experimental and Clinical Psychopharmacology, 23*(6), 428-435. doi:10.1037/pha0000039

Yeom, H. S. (2015). Utilization of substance abuse treatment: Gender differences among participants in an aftercare program. *Social Work in Public Health, 30*, 578-591. doi:10.1080/19371918.2015.1084773

Zalewska-Kaszubska, J. (2015). Is immunotherapy an opportunity for effective treatment of drug addiction? *Vaccine, 33*(48), 6545-6551. doi:10.1016/j.vaccine.2015.09.079

Appendix A: Permission to use the Drug-Related Locus of Control Dataset

From: yolanda travis **[truncated]**

Sent: Monday, March 16, 2015 7:24 AM

To: [truncated]

Subject: Doctoral Permission to use the DRLOC

YOLANDA RENE TRAVIS

[truncated]

March 16, 2015

Dr. Elizabeth A. Hall,

[truncated]

Dear Dr. Hall,

My name is Yolanda René Travis. I am a doctoral student at Walden University located in Minneapolis, Minnesota. I am currently working on my dissertation and I am ready to start my research. I will be examining The Relationship Between Impulsivity, Locus of Control, and Addictive Behaviors Among People in Methadone Maintenance Treatment Programs.

I read your article, Feelings About Drug Use, Drug-Related Locus of Control. I am very excited that you have developed an individualized instrument that targets drug use across modalities. My interest is to focus on patients diagnosed with Opioid Use Disorder. Your instrument will help my research by measuring locus of control over sustained abstinence or ongoing drug use while receiving narcotic therapy at Methadone Maintenance Treatment Programs located in Central and Northern California. The DRLOC will serve as an effective assessment tool for my research in lieu of having to develop my own instrument to measure locus of control in this population.

I would like your permission to use the DRLOC scale in my research to measure internal and external locus of control. If I have your permission to use this instrument, please let me know as soon as possible.

My long-term goal is to be a psychologist specializing in addictive behaviors. I look forward to your response.

Sincerely,

Yolanda Rene′ Travis

[truncated]

From: [truncated]

To: [truncated]

CC: [truncated]

Subject: RE: Doctoral Permission to use the DRLOC

Date: Mon, 16 Mar 2015 13:39:55 -0700

Yes, you have my permission to use the DRLOC. It sounds like a fascinating study. Good luck and please let me know what you find.

--Betsy

Elizabeth A. Hall, Ph.D.

[truncated]

Appendix B: Drug-Related Locus of Control Scale

Drug-Related Locus of Control (DRLOC)

Now, I'm going to ask you about your feelings about drug use. I'm going to read two statements, Statement A and Statement B, and ask you to choose the one that best describes how you feel now.

(CIRCLE ONE NUMBER FOR EACH STATEMENT)

1. A. I feel so helpless in some situations that I need to get high.....1

   B. Abstinence is just a matter of deciding that I no longer want to use drugs.....2

2. A. I have the strength to withstand pressures at work or home.....1

   B. Trouble at work or home drives me to use drugs.....2

3. A. Without the right breaks you cannot stay clean.....1

   B. Drug abusers who are not successful in curbing their drug use often have not taken advantage of help that is available.....2

4. A. There is no such thing as an irresistible temptation to use drugs.....1

   B. Many times there are circumstances that force you to use drugs.....2

5. A. I get so upset over small arguments that they cause me to use drugs.....1

   B. I can usually handle arguments without using drugs.....2

6. A. Successfully kicking substance abuse is a matter of hard work, luck has little or nothing to do with it……..……1

   B. Staying clean depends mainly on things going right for you.....2

7. A. When I am at a party where others are using, I can avoid taking drugs.....1

B. It is impossible for me to resist drugs if I am at a party where others are using.....2

8. A. I feel powerless to prevent myself from using drugs when I am anxious or unhappy.....1

B. If I really wanted to, I could stop using drugs.....2

9. A. It is easy for me to have a good time when I am sober.....1

B. I cannot feel good unless I am high.....2

10. A. I have control over my drug use behaviors.....1

B. I feel completely helpless when it comes to resisting drugs.....2

11. A. Sometimes I cannot understand how people can control their drug use.....1

B. There is a direct connection between how hard people try and how successful they are in stopping their drug use.....2

12. A. I can overcome my urge to use drugs.....1

B. Once I start to use drugs I can't stop.....2

13. A. Drugs aren't necessary in order to solve my problems.....1

B. I just cannot handle my problems unless I get high first.....2

14. A. Most of the time I can't understand why I continue to use drugs.....1

B. In the long run I am responsible for my drug problems.....2

15. A. Taking drugs is my favorite form of entertainment.....1

B. It wouldn't bother me if I could never use drugs again.....2

SCORING: FEELINGS ABOUT DRUG USE

Drug-Related Locus of Control (DRLOC)

The Drug-Related Locus of Control scale is a 15-item, forced-choice measure of drug-use control expectancies in a variety of drug-use-related situations. The scoring procedures below are designed so that clients with a more internal locus of control would produce scores nearer to 1, while those with a more external locus of control would produce scores nearer to 2. To produce this result, Items 1, 3, 5, 8, 11, 14, and 15 must be reverse coded. After recoding, the DRLOC score is computed simply by taking the mean score of all the items.