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EXAMINATION OF IMPULSIVITY AND CONTEMPLATION DIFFERENCES IN  
INCARCERATED OPIATE USERS VERSUS OTHER SUBSTANCE USERS

BY

Pauline M. Marcussen

A doctoral project submitted to the faculty of the Medical University of South Carolina  
in partial fulfillment of the requirements for the degree  
Doctor of Health Administration  
in the College of Health Professions

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## Acknowledgements

I want to thank my parents, Roger and Florence Guertin, for their love and understanding as I continue my journey of lifelong learning. To my sisters and brothers, Denise, Paul, Marc, and Elizabeth, thank you for making me laugh and being there for me.

To the loves of my life: my daughter Kathryn, my daughter and daughter-in-law, Kara and Melissa, and my grandchildren, Logan Christopher and Emmie Riede, you are the reasons I truly enjoy life!

To all of my friends, family, and colleagues, thank you for listening and encouraging me every step of the way.

To Dr. Annie Simpson, Dr. Jillian Harvey, and Dr. Brent Gibson, thank you for sharing your expertise, providing guidance, and for being my inspiration throughout this amazing process.

I would be remiss if I did not thank my life coach, my godmother, Grace E. Trahan, the woman who taught me to treat people with dignity and respect all the while showing me that personal goals are attainable. And, my friend and neighbor, Mr. J., thank you for your kindness, friendship, and always having those much-needed words of encouragement.

This journey would not have been possible without you. I will be forever grateful for the kindness, love, and support from all of you. Thank you.

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## CHAPTER I INTRODUCTION

### **Background and Need**

Opiate addiction is prevalent across the country and overdose deaths post-incarceration continue to take a toll on our communities (Alex, 2017). As noted by Waller in April 2018, the leading cause of death for people under the age of 50 is opiate use. Opiate addiction is treatable with the use of methadone, buprenorphine, or naltrexone and yields effective treatment results (Waller, 2018).

Research shows that many substance users are pre-destined from childhood if there were problems within the family unit, they associated with peers who lived troubled lives, or grew up in a high crime community (Facchin, 2016). Criminality and drug use appear to be linked (Facchin, 2016). Individuals who suffer from substance use disorders may feel stigmatized as they are perceived as being violent and dangerous (Birtel, 2017) while others feel the stigma leads to a sense of having no value in society which causes them to become secretive (Hunter, 2017).

Incarceration provides an opportunity to work with people addicted to opiates. Many state and local jurisdictions are working towards providing patients with the tools they need to remain drug-free upon release. With the use of evidence-based programming inside the walls of correctional facilities, patients can learn how to self-regulate their triggers. The objective of this study is to examine the triggers and character traits for people who use opioids and other illicit drugs which can lead to a sentinel event (incarceration). The purpose of this study is to provide information to correctional health

professionals to assist in the development of interventions for treatment of this disease and for prevention of relapse post-incarceration.

### **Problem Statement**

Opiate addiction and opiate overdoses are on the rise. The incarcerated population is at higher risk of opiate overdose death within thirty days of release from prison (Green, 2018; Alex, 2017). Therefore, there needs to be a better understanding of the characteristics and post-release triggers for incarcerated individuals with a history of opioid use.

### **Research Question**

Which impulsive behaviors do opiate users exhibit as compared to those who abuse other types of drugs (marijuana, amphetamines, barbiturates)? Can we identify the opiate drug user's level of contemplation as compared to those who abuse other types of drugs?

### **Population**

The population involved in this study are men and women with an opiate or other substance addiction who are over the age of eighteen and committed to a state jail facility. The study will utilize data on four hundred and thirty-two (432) individuals who were consented within forty-eight (48) hours of arrival and asked to complete a survey shortly thereafter.

## CHAPTER II REVIEW OF THE LITERATURE

### **Introduction**

The United States is leading the way in opiate addiction with an eighty-three percent (83%) consumption rate of the world's oxycodone and ninety-nine percent (99%) of the world's hydrocodone (Smirnova, 2017). Women are almost twice as likely as men to be prescribed a psychotropic opiate or an anti-anxiety medication and are more likely to become addicted (Smirnova, 2017). Research indicates opiate addiction is more common amongst whites at almost eighty-six percent (Smirnova, 2017). Approximately half of all prison inmates have a substance use disorder as compared to only nine percent of the general population (Young, 2017).

In an eighteen (18) year time frame, opioid overdose deaths dramatically increased from 8,048 (in 2002) to 49,068 (provisional 2017); deaths due to heroin went from 1,960 (in 2002) to 15,958 (provisional 2017); and deaths due to fentanyl soared from 730 (in 2002) to 29,406 (provisional 2017) (National Institute of Drug Abuse, 2018). A study performed in New York City which focused on a seventeen-month reporting period in 2011 and 2012 revealed 37.3% of the 59 formerly incarcerated men and women who expired within forty-two (42) days of release, died of an overdose due to the use of opiates. (Alex, 2017).

Facchin and Margola (2016) conducted a limited study of twenty-five inmates who were drug-dependent to elicit the specifics of their upbringing, substance use, and home environment as children. Their research shows many substance users are

predestined from childhood to engage in drug use if they grew up in a problem-laden household (drug or alcohol abuse by parents, brothers, or other family members), criminal behaviors by father or siblings, and/or domestic violence (Facchin, 2016). Individuals who lived in poor neighborhoods, had family members who were drug users, and turned to crime in order to support their drug habits are more likely to see this as normal behavior. The participants became involved in the same type of behaviors in order to be part of this group dynamic (Facchin, 2016). Eventually, drug use for pleasure may turn to dependence (physical and psychological). Facchin discusses three pathways towards dependence: a) drugs are needed in order to feel powerful and limitless, b) drugs are used after having experienced a trauma, and c) drugs used because of the need to relieve the pain (not just physical pain but anxiety, fears, and worries). The Facchin study revealed that incarceration can be a turning point where the participant can engage in treatment, professional counseling, and given access to resources for a smoother re-entry into the community to support sobriety (Facchin, 2016).

Based on a study of thirty-five (35) inmates, men and women showed similar psychiatric histories most notable for symptoms of depression in 50% of the participants while 62.9% admitted to anxiety, hallucination, tension, and worry (Nestor, 2018). Within this cohort, men are more likely to report depression (60.9%) than women (27.4%) over the course of 30 days. Whereas women are more likely to take medication for emotional problems (77.8%) as compared to men (28.6%). Nestor notes that 66.7% of men reported hallucinations over their lifetime which may have been due to psychosis with a co-occurring substance use disorder (Nestor, 2018).

A study of sixty-four (64) participants enrolled in a substance abuse rehabilitation program in the United Kingdom revealed substance users feel stigmatized because they are labeled as being violent and dangerous (Birtel, 2017). They report an increased number of mental health issues, poor sleep patterns. This study revealed the perception of stigmatization of substance abuse was associated with low self-esteem, increased anxiety and depression, and poor quality of sleep. There is an overwhelming sense of shame and stigma associated with substance abuse (Birtel, 2017). Drug addiction inherently causes stigmatization which leads the person to feel de-valued leading to secrecy (Hunter, 2017). Coping skills to avoid secrecy, rejection, and further psychiatric issues have been shown to improve the likelihood that someone seeking social support for substance abuse issues can be successful (Hunter, 2017).

In the past, health insurers did not cover substance abuse treatment, so it was difficult for individuals to receive residential treatment for alcohol and drug abuse. In 2008, the Paul Wellstone and Pete Domenici Mental Health Parity and Addiction Act was passed which required the elimination of offering better coverage for medical issues and less coverage for mental health and substance abuse illnesses. The lack of parity for people seeking treatment has been widely criticized as it is far easier to receive treatment for a physical medical condition than it is for a mental health or substance use problem which makes treatment a true hardship for anyone with a substance use disorder (Barry, 2016).

Not only are substance abusers stigmatized by the community, healthcare providers have negative attitudes towards them as well (Birtel, 2017). In general, there is

an underlying trust issue whereby physicians trust that patients are taking prescribed medications appropriately and patients rely on the medical expertise of their physicians to prescribe the appropriate medication for an ailment. A study was conducted at the Missouri Department of Corrections at two female facilities which revealed the participants did not trust the physicians, the institutions, or themselves so they felt their addiction was due to the fact the physicians were merely pushing medications in order to get bigger paychecks (Smirnova, 2017). The physicians did not trust patients as they appeared to be addicts who merely manipulated physicians into prescribing what they want instead of what the patient needed (Smirnova, 2017). Along these lines, patients in addiction treatment and recovery are encouraged to self-report substance use although drug testing is incorporated to confirm the patient's current substance use. Drug testing can also provide differentiation between intoxication and an underlying medical or psychiatric condition (Jarvis, 2017).

A study of 198 patients enrolled in a methadone and buprenorphine clinic in Hungary revealed negative life events led to the engagement in the use of opiates (Kapitany-Foveny, 2017). The participants noted they selected substances that were readily available but were able to easily substitute other substances when their choice of drug was not available (Kapitany-Foveny, 2017). Several of the participants continued to suffer relapses and the younger patients noted recurrent relapses so they dropped out of opiate treatment (Kapitany-Foveny, 2017). Simonelli defines relapse as a return to the disease state but, for many, it implies treatment failure (Simonelli, 2005).

### **Neurological Assessment**

Opiate addiction is no longer considered a character flaw or a weakness in willpower but a chronic neurological disorder that is treatable, with treatment rates between 40 and 80 percent (Waller, 2018). Shively notes this drug addiction is a brain disease that effects the reward system (Shively, 2018). Opiates increase the dopamine effects at the rate of two to ten times the normal amounts produced by natural rewards like eating and sexual release (NIDA, 2016).

Due to the fact that substance abuse affects dopaminergic activity which is linked to the reward circuits in the brain, this leads to impaired and impulsive decision making and ultimately can lead to drug-related crimes. Addiction is not a choice but a disease that changes the brain and lasting recovery takes place one day at a time. Symptoms can resurface years later with loss of control, intense cravings, and the inability to recognize changes in one's personality. People suffering from addiction are not weak in willpower or flawed but should be recognized as someone fighting a chronic brain disease (Shively, 2018; Young, 2018).

It has been found that an opiate abuser's motivation and intention to take the necessary steps to recovery follow the five stages used to change any addictive behavioral pattern (DiClemente, 2004). The stages are: a) pre-contemplative stage, where the individual has no interest in making a change; b) contemplation, the stage where the individual reviews the risks/rewards and makes a decision; c) preparation, which involves making a commitment and developing a plan; d) action, taking the steps to implement the plan; and e) maintenance stage, the new behavior becomes the norm (DiClemente, 2004).

As discussed in the study, individuals usually arrive in a treatment program focused on a primary drug but most are polydrug abusers (heroin, cocaine, marijuana, prescription drugs), as well as alcohol and cigarette users, so programs need to be re-imagined to include multiple addictions (DiClemente, 2004).

The stigma associated with drug abuse spans decades and has been made worse by the use of derogatory terms. In an article written in 2008 by Radcliffe, et. al., the term “junkie” was coined to negatively reference a drug user (Radcliffe, 2008). This term was based on a situation in the 1920’s when New York City had “junkmen” who were heroin users who sold scrap metal to support their drug habits. The term is still widely used to associate a drug user with trash and criminality.

A study of HIV and non-HIV positive participants revealed people who use illicit drugs have a high level of unemployment and seek ways to find financial stability. The study of 1,876 substance users in Vancouver, Canada, noted they experienced violence at the hands of law enforcement, domestic partners, or others related to high risk activities like drug dealing, sex work, and/or theft. Fifty-two percent (52%) of the respondents were exposed to violence and they were often homeless. They were unable to secure a regular job due to their drug use and high-risk behaviors. In order to maintain their level of drug use, they resorted to law breaking activity (Richardson, 2015).

### **Jails and Prisons-A History of Correctional Health**

Historically, in the United States (US), the only people with a constitutional right to healthcare are prisoners. Except for the requirement for emergency departments in hospitals to stabilize life-threatening situations, for everyone else healthcare is generally a



privilege (EMTALA, 2019). A 1976 legal case *Estelle v. Gamble* guaranteed prisoners three basic rights: the right to access to care, the right to care that is ordered, and the right to a professional medical judgment (Rold, 2008; Nowotny, 2016). This case and others are based on the premise set forth in the Eighth Amendment to the U.S. Constitution that prohibits cruel and unusual punishment. In the 1800's that translated to whipping, castration, disembowelment, even beheading. In the early 1970's, it was still widely known that inmates were performing surgery, pulling teeth, and caring for the sick without supervision (Rold, 2008). *Estelle* changed the course of correctional healthcare to the degree that standards of care were developed by the National Commission on Correctional Health Care (NCCHC). These standards are the basis for today's accrediting rules for prisons, jails, detention centers, mental health services, and opioid treatment programs in correctional facilities (NCCHC, 2018).

Access to care is important in order to protect incarcerated men and women from unnecessary harm (loss of life or limb) and/or undue suffering. The patient has the right to the care ordered by a medical professional without delay. Of equal importance is, if it is the judgment of the medical professional that a treatment is ordered, others cannot "second guess" the order (Rold, 2008). Prior to *Estelle*, the American Medical Association (AMA) performed a study in 1972 of American jails that revealed 25% had no medical facilities, 28% had no regular sick call, 11.4% did not have a physician-on-call, and 65.5% only provided first aid as medical care which prompted the AMA to create the NCCHC. Under this guidance, correctional institutions could become

accredited which helped many of them come out from under consent decrees due to the lack of health care services and horrendous living conditions (Rold, 2008).

Health care in prisons has an impact on public health as Nowotny noted Black men are more likely to receive health care during their incarceration due to their inability to access healthcare while living in their community. Overall, this leads to a decrease in the disparity between the health care provided to Blacks and Whites (2016). Nowotny also notes that Blacks are over-represented in jails/prisons and underrepresented in health care coverage in the community so this may be the best chance they have for quality health care in their lifetime. Therefore, it is vitally important to provide a transition of care plan as they prepare for re-entry into the community (Nowotny, 2016).

Although incarceration allows opportunities for sobriety, it is noted that several metropolitan areas are using crisis intervention teams as part of the law enforcement/first responder units to handle mental health and substance use calls in hopes of avoiding incarceration (Abreu, 2017). "Intercept 0" is a project initiated because law enforcement agencies across the country needed assistance with dealing with these issues so de-escalation techniques, overdose treatment protocols, and mental health training programs were developed (Abreu, 2017). As such, law enforcement and first responders realized they were the first line of defense and adopted the use of naloxone in order to rescue opiate abusers on the street. Abreu noted this was a step needed to decrease the number of overdose deaths (Abreu, 2017).

Under the Affordable Care Act (ACA), formerly incarcerated men and women are eligible for Medicaid assistance if their state participated in the expansion of Medicaid in

2014. Anyone can qualify for Medicaid under the expansion if they are between the ages of 19 and 64 and make less than 135% of the poverty level. As many formerly incarcerated men and women are unable to secure employment due to having a felony conviction, they qualify for Medicaid upon release from the jail or prison. The goal is to prevent delays in medical and mental health care post-release (Barnett, 2014). Formerly incarcerated men and women encounter barriers which can derail their treatment plans and ultimately lead to re-incarceration to start the cycle again (Barnett, 2014) as a majority of treatment facilities require valid insurance at the time of the encounter. Individuals without insurance who need medical, mental health, or substance use treatment seek care in local emergency rooms which drives up the cost of care for all patients. Yet, individuals with insurance are more likely to follow through with scheduled appointments and medications (Barnett, 2014).

### **Drug Abuse Assessment Tools**

Self-efficacy, or one's belief that goals are achievable through organization and action, is a predictor of whether a person can attain achievements. The Drug Avoidance Self Efficacy Scale created by Dr. Garth Martin was designed as a tool to look at someone's intent to take drugs (Martin, 1995). The tool rates the individual's confidence level to resist drug use for each of sixteen (16) instances. The same tool was used to predict relapse in young adults seeking substance use treatment (Martin, 1995). The sixteen (16) situations are established triggers and the participant gauges their intent to take drugs. The scale ranges from a high of seven (7) which notes the participant is certainly likely to take the drug to a low of zero (0) where the same person certainly

would not take the drug. There are five other choices in between. An example of a situation places the person at a party and feeling uptight. The others seem to be having a good time. The person is tempted to use drugs to loosen up. What would the individual do? The participant responds to all sixteen situations which shows their intent to use drugs in those particular situations. The tool is widely acknowledged as a unidimensional tool that can assist the provider in predicting intent of future drug use although some questions include more than one factor for consideration making the participant choose one factor over the other when selecting their response (Martin, 1995). Review of the literature on self-efficacy reveals further study is needed to determine if self-efficacy is a determinant of a behavior change or merely the thought that behavioral change happened for another reason (Kadden, 2011). The tool itself does not recognize the stage at which the questions are asked (abstinence versus recent drug use) and the quantity used (Martin, 1995).

The National Institute on Drug Abuse (NIDA) supported the development and continued updates of another tool called the Addiction Severity Index (ASI), which looks at the severity of the health and social problems in people with addiction problems (McLellan, 2006). This tool is not just a question and answer survey of the drugs of choice and amounts used, but a more refined look at the severity, longevity, and nature of the problems that helps to create a well-rounded treatment plan with the goal of improving outcomes like decreasing criminal activity, lowering utilization of unnecessary health care services, finding suitable housing and engaging in employment opportunities (McLellan, 2006). The ASI is part of the standard clinical assessment of alcohol and drug

abuse patients across the country, as well as within the Veterans Administration, the Indian Health Service, and is accepted by the World Health Organization for use internationally (McLellan, 2006).

The Texas Christian University Drug Screen 5 and Opioid Supplement assessment tool produces a score between zero and nine with greater than three revealing a relatively-severe drug-related problem (Simpson, 2008; McKnight, 2017). The screen further defines the drugs of choice, route, and quantity, which helps to place the patient in the appropriate treatment program. Once enrolled in a program, the goal is to utilize the University of Rhode Island Change Assessment Scale to promote a change in lifestyle through the avoidance of drugs (Lal, 2018).

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## **Conclusion**

Opioid addiction is the leading cause of death for adults under the age of fifty. For many, their drug use is a result of: childhood trauma, having family members involved in drugs, being surrounded by criminal activity, or the lack of parental support. Not all drug users become addicts, however research shows that drugs make changes to the brain in the pleasure/reward area at a rate two to ten times greater than the pleasure of eating or experiencing sexual pleasure. Drug use, often concomitant with mental health problems, has been shown to lead to risk-taking behaviors which may result in law breaking activities and incarceration. The introduction of appropriate health care and substance use treatment programs in the jails or prison may provide the best opportunity for change in the drug abuse/incarceration cycle in the US. Assessment tools are available at little or no cost to the institution which can form the beginning of an evidence-based program to

treat drug addiction. Currently, little is known about the personal traits or triggers that are most likely to lead to a greater prevalence of abuse relapse after incarceration. This study aims to examine factors related to personalities and triggers in incarcerated individuals shortly after facility intake.

## CHAPTER III METHODOLOGY

### **Research Design**

This is a quantitative study using archival survey data looking at the triggers and character traits of individuals incarcerated who were consented within forty-eight hours of incarceration after self-reporting the use of opioid drugs. The project is entitled: Methods of Understanding Sentinel Events (MUSE) with the sentinel event being incarceration.

### **Sample Selection**

Surveys were completed by 432 participants after informed consent. The population includes males and females over the age of 18 who can speak and understand English. The surveys were conducted from November 14, 2012 through October 21, 2013 in the state of Rhode Island.

### **Instrumentation**

The questionnaire was in the form of an electronic survey on a tablet using Questionnaire Development System (QDS) software by NOVA Research Company. Participants provided informed consent to a research assistant prior to commencement of the survey.

### **Data Set Description**

Basic demographic data includes: year of birth, race and/or ethnicity, and level of education from grade school to graduate/advanced degree, with or without GED (if not a high school graduate). Also included are marital status, living situation, and employment

status, as well as income over the prior thirty days. Included in the data is the Texas Christian University Drug Screen (Simpson, 2008; McKnight, 2017), the Barratt Impulsivity Scale: BIS-11 (Patton, Stanford, Barratt, 1995), and the In-Prison Drug Contemplation Ladder (2012).

The Principal Investigator, Jennifer Clarke, MD, MPH, granted permission for the use of the data set at no cost. Her project was funded by the National Institute of Health and the study was approved by Memorial Hospital of Rhode Island's Institutional Review Board and she was granted access to the participants by the Rhode Island Department of Corrections' Medical Research Advisory Group (MRAG).

### **Data Collection/Procedure**

The sequence of events: 1) tell people within 48 hours of admission about the study; 2) obtain verbal consent to screen for eligibility; 3) if eligible, describe the details of the study; 4) obtain informed consent if the individual is eligible and wants to participate in the study; 5) administer a 45-60 minute Audio Computer-Assisted Self-Interview (A-CASI) questionnaire which includes the assessment forms noted above. Data was uploaded to an encrypted server for access by the Principal Investigator. All participants completed one questionnaire only during the course of the study and no follow-up data was gathered.

### **Research Questions and Hypotheses**

#### **AIM 1**

Which impulsive behaviors do opiate users exhibit as compared to those who abuse other types of drugs (marijuana, amphetamines, barbiturates)? Barratt Impulsivity



Scale defines impulsivity as a tendency to act on a whim with little or no regard for consequences of the behavior. Attentional impulsiveness assesses task-focus, intrusive thoughts, and racing thoughts. Motor impulsiveness assesses the tendency to act on the spur of the moment and consistency of lifestyle, and non-planning impulsiveness assesses careful thinking and planning and enjoyment of challenging mental tasks (Patton, 1995).

Hypothesis 1:

The null hypothesis: Average attentional impulsiveness score does not differ between the opiate drug user group and the group of people who abuse other types of drugs.

The alternative hypothesis: There is a difference in the average attentional impulsiveness score between the opiate drug user group and the group of people who abuse other types of drugs.

Hypothesis 2:

The null hypothesis: Average motor impulsiveness score does not differ between the opiate drug user group and the group of people who abuse other types of drugs.

The alternative hypothesis: There is a difference in the average motor impulsiveness score between the opiate drug user group and the group of people who abuse other types of drugs.

Hypothesis 3:

The null hypothesis: Average non-planning impulsiveness score does not differ between the opiate drug user group and the group of people who abuse other types of drugs.

The alternative hypothesis: There is a difference in the average non-planning impulsiveness score between the opiate drug user group and the group of people who abuse other types of drugs.

Hypothesis 4:

The null hypothesis: Average total impulsivity score does not differ between the opiate drug user group and the group of people who abuse other types of drugs.

The alternative hypothesis: There is a difference in the average total impulsivity score between the opiate drug user group and the group of people who abuse other types of drugs.

## **AIM 2**

Can we identify the opiate drug user's level of contemplation as compared to those who abuse other types of drugs?

Hypothesis 1:

The null hypothesis: Average in-prison contemplation ladder score does not differ between the opiate drug user group and the group of people who abuse other types of drugs.

The alternative hypothesis: There is a difference in the average in-prison contemplation ladder score between the opiate drug user group and the group of people who abuse other types of drugs.

### **Independent and Dependent Variables**

Independent variables include: age, race/ethnicity, education, marital status, employment status at the time of incarceration, income in the prior thirty (30) days of incarceration, use opiates (yes or no), and number of incarcerations.

Dependent variables: Readiness for change using the In-Prison Contemplation Ladder for the adult with a substance-use disorder which rates their willingness to be sober as a single digit from one to ten with ten being committed to not using to one being no change. The Barratt Impulsiveness Scale includes thirty items assessing three subscales with total scores in the high range demonstrates more impulsivity and in the low range demonstrates less impulsivity. The In-Prison Contemplation Ladder is used to measure anxiety, sensation/thrill-seeking behaviors to elicit the likelihood they can make the choice to remain drug-free.

### **Data Analysis**

Descriptive statistics will be performed on demographics characteristics and survey responses in the above-referenced constructs (impulsiveness and contemplation). Categorical data will be described using counts and percentages, and continuous variables will be described with means and standard deviations (medians and interquartile range if non-normal). Unadjusted differences between groups will be examined using chi-square test for categorical data and two sample t-tests for continuous variables (Wilcoxon Signed Rank test will be used if non-normal).

## **Analyses of Hypotheses**

### **Barratt's Impulsiveness Scale:**

Two sample t-tests (between opiate drug user group and the group of people who abuse other types of drugs) will be used to examine each of the three sub-traits (attentional impulsiveness, motor impulsiveness, and non-planning impulsiveness). If significant demographic differences are found between the two groups, multivariable regression will be used to estimate scale differences between groups while controlling for differences in demographics.

### **In-Prison Contemplation Ladder:**

A two-sample t-test (between opiate drug user group and the group of people who abuse other types of drugs) will be used to examine differences in mean contemplation ladder score. If significant demographic differences are found between the two groups, multivariable regression will be used to estimate ladder score differences between groups while controlling for differences in demographics. If contemplation ladder average scores are not normally distributed, the appropriate non-normal methods will be used to estimate unadjusted and adjusted differences between groups.

## **Protection of Human Subjects**

The MUSE dataset is de-identified archival data from 2012-2013 (Clarke). Informed consent forms were obtained by the Principal Investigator at the time of the study, but all identifiers were removed from the file prior to transfer. The study is exempt from IRB review.

The goal is to provide information on the willingness of opiate users to remain sober and if opiate users are more or less impulsive in using opiates than those who abuse other types of drugs. With this awareness, it is anticipated that correctional professionals can develop programs to provide training in coping mechanisms, initiate Medication-Assisted (MAT) therapy, and enroll subjects in a support network while incarcerated with the goal of post-release follow-up with a community provider.

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CHAPTER IV  
ARTICLE MANUSCRIPT

**Abstract**

Opiate addiction is widespread across the country and yet it is a treatable disease. Incarcerated men and women were screened upon commitment to a jail in Rhode Island about their substance use history. Of the 432 individuals screened, 430 survey responses were used in this study. Opiate users accounted for 23% (97) of the total with 77% (333) noting they use other substances. All study participants voluntarily admitted to using opiates or other substances at the time of informed consent. Two hundred and thirty-one (231) or 53% plan to stop using drugs after release from incarceration. The unadjusted total impulsivity score for opiate users revealed a mean of 38.21 (8.0 s.d.) as compared to a score of 33.83 (8.7 s.d.) for other substance users. The goal of this study is to compare opiate users to other substance users as it relates to the character trait of impulsivity using Barratt's Impulsivity Scale as well as whether they contemplate remaining drug-free post-release through the use of the In-Prison Drug Contemplation Ladder.

**Keywords**

Contemplation ladder, impulsivity scale (Barratt's), opiate user, incarceration

## **Introduction**

Opiate addiction is prevalent across the country and overdose deaths post-incarceration continue to take its toll on our communities (Alex, 2017). As noted by Waller in April 2018, the leading cause of death for people under the age of fifty (50) is opiate use. Opiate addiction is treatable with the use methadone, buprenorphine, or naltrexone and yields effective treatment results (Waller, 2018).

The United States is leading the way in opiate addiction with an eighty-three percent (83%) consumption rate of the world's oxycodone and ninety-nine percent (99%) of the world's hydrocodone (Smirnova, 2017). Women are almost twice as likely as men to be prescribed a psychotropic opiate or an anti-anxiety medication and are more likely to become addicted (Smirnova, 2017). Research indicates opiate addiction is more common amongst whites at almost eighty-six percent (Smirnova, 2017). Approximately half of all prison inmates have been diagnosed with a substance use disorder as compared to only nine percent of the general population (Young, 2017).

It was found that an opiate abuser's motivation and intention to take the necessary steps to recovery follow the five stages used to change any addictive behavioral pattern (DiClemente, 2004). The stages are: a) pre-contemplative stage, where the individual has no interest in making a change; b) contemplation, the stage where the individual reviews the risks/rewards and makes a decision; c) preparation, which involves making a commitment and developing a plan; d)

action, taking the steps to implement the plan; and e) maintenance stage, the new behavior becomes the norm (DiClemente, 2004). As discussed in the study, individuals usually arrive in a treatment program focused on a primary drug but most are polydrug abusers (heroin, cocaine, marijuana, prescription drugs), as well as alcohol and cigarette, so programs need to be re-imagined to include multiple addictions (DiClemente, 2004).

Historically, in the United States (US), the only people with a constitutional right to healthcare are prisoners. Except for the requirement for emergency departments in hospitals to stabilize life-threatening situations, healthcare for everyone else is a privilege (EMTALA, 2019). A 1976 legal case entitled *Estelle v. Gamble* guaranteed prisoners three basic rights: the right to access to care, the right to care that is ordered, and the right to a professional medical judgment (Rold, 2008; Nowotny, 2016). This case and others are based on the premise set forth in the Eighth Amendment to the U.S. Constitution that prohibits cruel and unusual punishment. In the 1800's that translated to whipping, castration, disembowelment, even beheading. In the early 1970's, it was still widely known that inmates were performing surgery, pulling teeth, and caring for the sick without supervision (Rold, 2008). *Estelle* changed the course of correctional healthcare to the degree that standards of care were developed by the National Commission on Correctional Health Care (NCCHC). These standards are the basis for today's accrediting rules for prisons, jails, detention



centers, mental health services, and opioid treatment programs in correctional facilities (NCCHC, 2018).

Access to care is important in order to protect incarcerated men and women from unnecessary harm (loss of life or limb) and/or undue suffering. The patient has the right to the care ordered by a medical professional without delay. Of equal importance is, if it is the judgment of the medical professional that a treatment is ordered, others cannot “second guess” the order (Rold, 2008). Prior to *Estelle*, the American Medical Association (AMA) commissioned a study in 1972 of American jails which showed 25% had no medical facilities, 28% had no regular sick call, 11.4% did not have a physician-on-call, and 65.5% only provided first aid as medical care which prompted the AMA to form the NCCHC. Under their guidance, correctional institutions became accredited which provided relief from consent decrees issued due to the lack of health care services and horrendous living conditions (Rold, 2008).

Impulsivity is defined as the tendency to act suddenly without any planning or to be insensitive to the consequences of that action. Drug use may cause the user the inability to make good decisions while others who are trying to abstain from using drugs (opiates or other substances) may be unable to control the craving for the drug (deWit, 2009). Measuring the differences in impulsivity scores by group characteristics (opiate users and other substance users) can be useful in tailoring opiate addiction programs with resultant effective treatment protocols in a jail environment.

## **Methods**

### **Study Design and Recruitment**

This is a quantitative study using archival survey data looking at the character traits of individuals incarcerated. They were consented within forty-eight hours of incarceration after self-reporting the use of opiates and other drugs/substances of abuse. The project is entitled: Methods of Understanding Sentinel Events (MUSE) with the sentinel event being incarceration (Clarke, 2012).

Surveys were administered to 432 participants after informed consent. Two participants did not complete the survey. The population included males and females over the age of 18 who spoke English. Race/Ethnicity was regrouped into the following categories: White, Black, Hispanic, and Other. The surveys were conducted from November 14, 2012 through October 21, 2013 in the state of Rhode Island.

Opiate users selected one of the following categories and are included in the opiate-users group: heroin and cocaine (mixed together as speed ball), cocaine by itself, heroin by itself, street methadone (non-prescription), other opiates/opium, morphine/Demerol. Other substance users include people who selected one of the following: marijuana/Hashish, hallucinogens/LSD/PCP/psychedelics/mushrooms, inhalants, crack/freebase, methamphetamines,

amphetamines (other uppers), tranquilizers/barbiturates/sedatives /benzodiazepines (downers), other drugs, and alcohol.

### **Study Procedure**

The sequence of events: 1) tell people within 48 hours of admission about the study; 2) obtain verbal consent to screen for eligibility; 3) if eligible, describe the details of the study; 4) obtain informed consent if the individual is eligible and wants to participate in the study; 5) administer a 45-60 minute Audio Computer-Assisted Self-Interview (A-CASI) questionnaire using Questionnaire Development System (QDS) software by NOVA Research Company. Data was uploaded to an encrypted server for access by the Principal Investigator. No follow-up surveys were completed.

The independent variables include: age, race and/or ethnicity, and level of education from grade school to graduate/advanced degree, marital status, living situation, and employment status, as well as income for thirty days prior to incarceration. Texas Christian University Drug Screen (Simpson, 2008; McKnight, 2017) is used to designate individual into the independent variable of type of drug use (opiate versus other substances user).

Dependent variables: The Barratt Impulsivity Scale: BIS-15 (Patton, Stanford, Barratt, 1995), and the In-Prison Drug Contemplation Ladder (2012) are the two validated instruments used to examine impulsivity and contemplation to quit. Readiness for change using the In-Prison Contemplation Ladder (2012) for the adult with a substance-use disorder which rates their willingness to be

sober as a single digit from one to ten with ten being committed to not using to one being no change. The Barratt Impulsiveness Scale includes fifteen items assessing three subscales with total scores in the high range demonstrating more impulsivity and in the low range demonstrating less impulsivity. The In-Prison Contemplation Ladder is used to measure anxiety, sensation/thrill-seeking behaviors which shows readiness to elicit the changes needed to remain drug-free.

### **Survey Instrument**

#### **Barratt's Impulsiveness Scale:**

Which impulsive behaviors do opiate users exhibit as compared to those who abuse other types of drugs (marijuana, amphetamines, barbiturates)? Barratt Impulsivity Scale defines impulsivity as behaviors that are unduly hasty, risky, and that lead to negative long-term outcomes (Chamberlain, 2019) or tendency to act on a whim with little or no regard for consequences of the behavior (Barratt, 1985). Attentional impulsiveness is defined as the inability to focus attention or concentrate (Stanford, 2009) and is on a scale from 4 to 16, with higher numbers indicating more difficulty focusing or concentrating. Motor impulsiveness involved acting without thinking or the tendency to act on the spur of the moment which is on a scale of 4 to 16, with higher numbers indicating inability to consider the consequences of the behavior. The Non-Planning impulsiveness sub scale measures the level of forethought or careful thinking (Stanford, 2009; Patton, 1995), and is on a scale of 6 to 24, with higher numbers indicating an

inability to adhere to rules or norms. The total impulsivity score is on a scale of 15 to 56 with higher numbers indicating a greater ability of acting without thinking of future consequences. The Barratt's Impulsivity Score used in this study is the short-form fifteen question (BIS-15) version with statements such as 1) I do things without thinking, 2) I plan for job security, 3) I don't pay attention, and 4) I concentrate easily (Appendix 2). This instrument is translated and widely used around the world with the general population and the incarcerated population as well (Stanford, 2009; Patton, 1995).

#### **In-Prison Contemplation Ladder:**

The In-Prison Drug Contemplation Ladder is an updated version of the Contemplation Ladder used in Smoking Cessation research studies. The ladder used in the prison setting uses a scale from ten (10) to one (1) with the higher number indicating the participant is ready to be a former drug user and the lower number indicating in all likelihood the participant will continue using drugs after release. The Contemplation Ladder is a good measurement of readiness to quitting a certain behavior like drugs and they are more likely to engage in events which help them take the next step toward changing the behavior. Readiness to change may be an indicator the participant is willing to quit the behavior with the long-term goal of abstinence (Biener and Abrams, 1991).

#### **Statistical Analysis**

Descriptive statistics were performed on demographics characteristics and survey responses in the above-referenced constructs (impulsiveness and

contemplation). Categorical data is described using counts and percentages, and continuous variables are described with means and standard deviations (medians and interquartile range if non-normal). Unadjusted differences between groups were examined using chi-square test for categorical data and two sample t-tests for continuous variables (Wilcoxon Signed Rank test if non-normal). Two sample t-tests (between opiate drug user group and the group of people who abuse other types of drugs) were used to examine unadjusted means for each of the three sub-traits (attentional impulsiveness, motor impulsiveness, and non-planning impulsiveness) as well as a total impulsivity score. Demographic differences were found between the two groups so multivariable linear regression was used to estimate scale differences between groups while controlling for differences in demographics.

A chi-square test of proportions was performed to examine unadjusted differences in contemplation ladder scores between opiate drug user group and the group of people who abuse other types of drugs. Multivariable ordinal logistic regression was used to estimate ladder score differences between groups while controlling for differences in demographics.

Researchers in this study hypothesized a priori that opiate users would have higher levels of impulsivity in total and in subscales and that drug contemplation levels would differ between the comparison groups. Analysis was conducted in SPSS version 24.0.0.0 64-bit edition and SAS version 9.4.

## Results

Of the 432 men and women who completed the survey, 430 questionnaires were included in the study as two participants failed to complete a majority of the questions. The participants are divided into two groups: opiate users (97, 23%) and other substances users (333, 77%). Other substances consisted of marijuana, amphetamines, barbiturates, and alcohol.

The descriptive characteristics examined for this study showed a significant difference between the comparison groups for age, race, employment, and number of times in jail but was not different when looking at income or education (Table 1). The opiate user group tended to be predominately between the ages of 26 and 35, with the other substance users falling more heavily in the younger and older age ranges ( $p < 0.0001$ ). Within the opiate user group 26% ranged in age between 18 and 25, 49% between the ages of 26 and 35, 14.6% between 36 and 45, and 10.4% at age 46 and older. The other substance user group revealed 35.6% between the ages of 18 and 25, 25.5% between 26 and 35 years of age, 23.6% between 36 and 45, and 15.3% age 46 and above (Table 1).

Income was not statistically different between comparison groups ( $p = 0.997$ ), with opiate user group and other substance user group showing values consistent between both groups (Table 1). Approximately 36% earned 0 to \$500 in the last thirty days, approximately 28% earned \$501 to \$1000, and 17% earning between \$1001 and \$2500 (Table 1).

The opiate user group was predominantly white at 63.9% as compared to the other substance user group with 47.1% white. Also noted, Blacks accounted for 6.2% of the opiate user group as compared to 16.8% of the other substance user group. The Hispanic population represented 19.6% of the opiate user group and 20.4% of the other substance user group (Table 1) ( $p=0.009$ ).

Education did not differ significantly ( $p=0.567$ ) with 53.7% opiate users without a high school diploma as compared to 48.3% of other substance users (Table 1). Opiate users with a high school diploma accounted for 27.4% of the respondents as compared to 28.1% of the other substance users. Those with greater than a high school diploma showed 18.9% (opiate users) and 23.5% (other substance users) (Table 1).

Seventy percent (70%) of the opiate users are unemployed as compared to 46.8% of the other substance users whereas 20.6% of the opiate users are employed either fulltime or part-time while 42% of the other substance users are employed ( $p<0.001$ ) (Table 1).

As this study was conducted in a jail facility, it is prudent to examine and compare the number of times the participants were ever in jail. There were significant differences between the two groups ( $p=0.017$ ). For the first or second time, 37.1% for the opiate users, 50.5% for the other substance users; for three to five times in jail, 35.1% for the opiate users, 21.9% for the other substance users, six to twelve times, 19.6% for the opiate users and 15% for the other substance users. Of the participants studied, those incarcerated thirteen or more times



included; 8.2% of the opiate users as compared to 12.6% of the other substance users (Table 1).

The unadjusted impulsivity outcomes revealed a mean attentional impulsivity score of 10.3 (3.7s.d.) for the opiate users and a mean of 9.26 (3.0 s.d.) for the other substance users ( $p=0.037$ ). Motor impulsivity mean score for the opiate user is 10.78 (2.9 s.d.) and 9.37 (3.2. s.d.) for the other substance users ( $p=0.456$ ). Non-planning impulsivity mean score for the opiate users is 17.12 (3.6 s.d.) and 15.20 (4.3 s.d.) for the other substance users ( $p=0.008$ ). The unadjusted Total Impulsivity Score revealed a mean of 38.21 (8.0 s.d.) for the opiate users and 33.38 (8.7 s.d.) for the other substance users ( $p=0.257$ ). The mean unadjusted Total Impulsivity Score for all participants ( $N=430$ ) is 34.67 (8.8 s.d.). There is a significant difference between the unadjusted attentional impulsivity and unadjusted non-planning impulsivity between the opiate users and other substance users (Table 2).

Barratt's Impulsivity Scale scores were consistently higher for the opiate users as compared to the other substance users when controlled for age group, employment group, and number of times in jail for attentional impulsivity and motor impulsivity scores. Non-Planning Impulsivity and Total Impulsivity Scores were controlled for age group, employment group, number of times in jail, and race group. The adjusted mean attentional score is 10.44 (0.35 s.e.) compared to 9.62 (0.23 s.e.) ( $p=0.022$ ); adjusted mean for motor impulsivity is 10.87 (0.36) and 9.67 (0.23) respectively ( $p=0.001$ ); and adjusted mean non-

planning score of 16.73 (0.49) and 15.65 (0.31) ( $p=0.024$ ); with a mean adjusted total impulsivity score of 37.71 (1.0) for opiate users and 34.83 (0.63) for other substance users ( $p=0.003$ ) (Table 3).

The In-Prison Drug Contemplation Ladder (developed by Lois Biener and David B. Abrams in 1991) includes ten selections (see Appendix 2) that were regrouped into three categories; 1) no plan to stop, 2) thinking of stopping, and 3) plan to stop. When reviewing the two groups, 60.8% of the participants stated they plan to stop taking opiates post-release as compared to the other substance users at 51.7%. The opiate users with no plan to stop is at 11.3% as compared with other substance users at 10.2% (Table 2). On average, 53.7% of the participants in this survey contemplated changing their drug use and plan to stop once released from jail, whereas 26.7% are thinking about stopping, while 10.5% have no plans to stop their drug use once they are back in the community. While unadjusted estimates indicated a statistically significant difference in the average in-prison contemplation ladder for the opiate users when compared with the other substance users (Table 2), these differences did not remain after examining using ordinal logistic regression with multivariable adjustment ( $p=.599$ , data not shown). When controlling for age, race, employment status, and number of times in prison, there is no significant difference in the contemplation level of stopping between the opiate user group and the other substance users.

## Discussion

Barratt's Impulsivity Scale is very widely used but is considered quite lengthy at 30 questions. The BIS-15 short form uses the most significant factors in order to shorten the length of time of the survey as well as to better define the impulsiveness score. Spinella (2007) notes the BIS-15 provides a better understanding of the second order factors of attentional impulsiveness, motor impulsiveness, and non-planning impulsiveness. Impulsiveness decreases with age and education (Spinella, 2007). This study found that opiate users have a higher rate of impulsive behaviors after controlling for age, employment, and number of times in jail with a mean score of 10.44 points. Opiate users have a higher score of motor impulsiveness as compared to the other substance users (10.87, 9.67) after adjustment for covariates. The non-planning impulsiveness score for the opiate users shows a mean of 16.73 as compared to 15.65. The overall impulsivity score for the opiate users versus the other substance users is 37.71 and 34.83 respectively (Figure 1). At the time of this survey, the participants ranged in age from 18 to 75 and the employment status revealed 70% of the opiate users to be unemployed as was 46.8% of the substance users.

Meule, et.al, conducted a study of female university freshman in 2008 using the BIS-15 short form and the mean total impulsivity score was 32.00 (5.59 s.d.) as compared to the opiate users (gender not identified) in this study with a mean unadjusted score of 38.21 (8.0 s.d.), indicating that the opiate users,

on average, have a high level of overall impulsiveness than a sample of university freshman females.

Almost fifty-four percent (53.7%) of the participants in this study indicated they are ready to quit opiates or other substances upon release from jail. Only 10.5% (45) of the total participants do not plan to stop using drugs upon release. Biener (1991) indicated this is merely an indicator of the subject's readiness to consider quitting in the next several months. The readiness scale assists in determining if the participant is ready to engage in events that can lead to quitting the behavior (such as enrolling in a medication-assisted therapy program or substance use counseling program) as another step towards remaining sober post-release. There is no subsequent follow-up data to see if the participants actually attempted to stop using drugs upon release or whether they continued using at the same rate as before entering the jail.

In 1991, Biener and Abrams conducted a smoking cessation study using the contemplation ladder which revealed 29.5% of the more than 400 smokers who participated were taking action to quit and 28.6% had no thoughts of quitting (Biener, 1991). In comparison, 60.8% of the opiate users and 51.7% of the other substance users were taking steps to quit their drug habits upon release from jail. Conversely, 11.3% of the opiate users and 10.2% of the other substance users have no plans on quitting once released from jail.

### **Conclusion, Limitations and Future Research**

Correctional healthcare professionals have the opportunity to provide patients with the skills and resources needed to remain sober after release. Sixty percent of the participants stated they plan to quit using drugs or take the appropriate steps to remain sober after release from jail. The contemplation ladder was initially created as a scale of readiness for smoking cessation but it can be used for a wide variety of programs such as drug addiction, gambling, and drinking. There are many reasons people want to be drug-free upon release and with the help of substance abuse treatment programs, they can be successful.

The United States continues to grapple with the opiate addiction crisis and there continues to be a need to work with people who struggle with this addiction. Opiate users scored higher in non-planning impulsivity as compared to the other substance users. Also of note, the motor impulsivity score is higher for the opiate users which means they are more likely to act on the spur of the moment without thinking of the consequences those actions hold. Evidence-based programming for this population can include Medication-Assisted Therapy (with methadone, buprenorphine, naloxone, and vivitrol), individual and group therapy, along with a rewards-type system to show that delaying gratification may lead to better opportunities in the future for employment, housing, and better relationships with family members (Mathias, 2008) A reward system in a jail environment might include the opportunity to enroll in a jail-based college course or be eligible for a paying job as a porter if the participant attends daily

group therapy sessions for twenty-one (21) consecutive days. Treatment programs must include thoughtful and realistic discharge planning and pre-release Medicaid enrollment (or immediate reactivation of prior Medicaid eligibility) so the patient has the opportunity to remain sober post release. Recognizing and treating patients with opiate addiction at the time of incarceration allows them the chance to learn the skills needed to remain drug-free upon release which might end the cycle of addiction and recidivism.

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Table 1. Characteristics of Opiate Users and Other Substance Users

	Total N=430	Opiate Users n=97	Substance Users n=333	
<b>Age</b>	<b>n (%)</b>	<b>n (%)</b>	<b>n (%)</b>	<b>p. value</b>
18-25	141 (33.4)	25 (26.0)	116 (35.6)	0.000
26-35	130 (30.8)	47 (49.0)	83 (25.5)	
36-45	91 (21.6)	14 (14.6)	77 (23.6)	
46+	60 (14.2)	10 (10.4)	50 (15.3)	
Missing	8	1	7	
<b>Income</b>	<b>n (%)</b>	<b>n (%)</b>	<b>n (%)</b>	<b>p. value</b>
0 to \$500	139 (36.3)	32 (36.8)	107 (36.1)	0.997
\$501 to \$1000	109 (28.5)	23 (26.4)	86 (29.1)	
\$1001 to \$2500	65 (17.0)	15 (17.2)	50 (16.9)	
\$2501 to \$4000	34 (8.9)	8 (9.2)	26 (8.8)	
\$4001 to \$5000	11 (2.9)	3 (3.4)	8 (2.7)	
\$5001 +	25 (6.5)	6 (6.9)	19 (6.4)	
Missing	47	10	37	
<b>Race</b>	<b>n (%)</b>	<b>n (%)</b>	<b>n (%)</b>	<b>p. value</b>
White	219(50.9)	62 (63.9)	157 (47.1)	0.009
Black	62 (14.4)	6 (6.2)	56 (16.8)	
Hispanic	87 (20.2)	19 (19.6)	68 (20.4)	
Other	62 (14.4)	10 (10.3)	52 (15.6)	
<b>Education</b>	<b>n (%)</b>	<b>n (%)</b>	<b>n (%)</b>	<b>p. value</b>
No HS Diploma	209 (49.5)	51 (53.7)	158 (48.3)	0.567
HS Diploma	118 (28.0)	26 (27.4)	92 (28.1)	
Greater Than HS	95 (22.5)	18 (18.9)	77 (23.5)	
Missing	8	2	6	
<b>Employment</b>	<b>n (%)</b>	<b>n (%)</b>	<b>n (%)</b>	<b>p. value</b>
Fulltime/Part time	160 (37.2)	20 (20.6)	140 (42.0)	0.000
Unemployed	224 (52.1)	68 (70.0)	156 (46.8)	
Other	46 (10.7)	9 (9.3)	37 (11.1)	
<b>No. Times in Jail</b>	<b>n (%)</b>	<b>n (%)</b>	<b>n (%)</b>	<b>p. value</b>
1 to 2	204 (70.4)	36 (37.1)	168 (50.5)	0.017
3 to 5	107 (17.2)	34 (35.1)	73 (21.9)	
6 to 12	69 (7.7)	19 (19.6)	50 (15.0)	
13 or more	50 (4.7)	8 (8.2)	42 (12.6)	

**Table 2. Unadjusted Contemplation Ladder and Impulsivity Outcomes**

	Total N=430	Opiate Users n=97	Substance Users n=333	
<b>Contemplation Ladder</b>	<b>n (%)</b>	<b>n (%)</b>	<b>n (%)</b>	<b>p. value</b>
No plan to stop	45 (10.5)	11 (11.3)	34 (10.2)	0.005
Thinking of stopping	114 (26.5)	27 (27.8)	87 (26.1)	
Plan to stop	231 (53.7)	59 (60.8)	172 (51.7)	
No answer	40 (9.3)	0 (0.00)	40 (12.0)	
<b>Barratt's Impulsivity</b>	<b>M (SD)</b>	<b>M (SD)</b>	<b>M (SD)</b>	<b>p. value</b>
Attentional	9.45 (3.2)	10.3 (3.7)	9.26 (3.0)	0.037
Motor	9.65 (3.1)	10.78 (2.9)	9.37 (3.2)	0.456
Non-Planning	15.57 (4.3)	17.12 (3.6)	15.20 (4.3)	0.008
Total Impulsivity Score	34.67 (8.8)	38.21 (8.0)	33.83 (8.7)	0.257

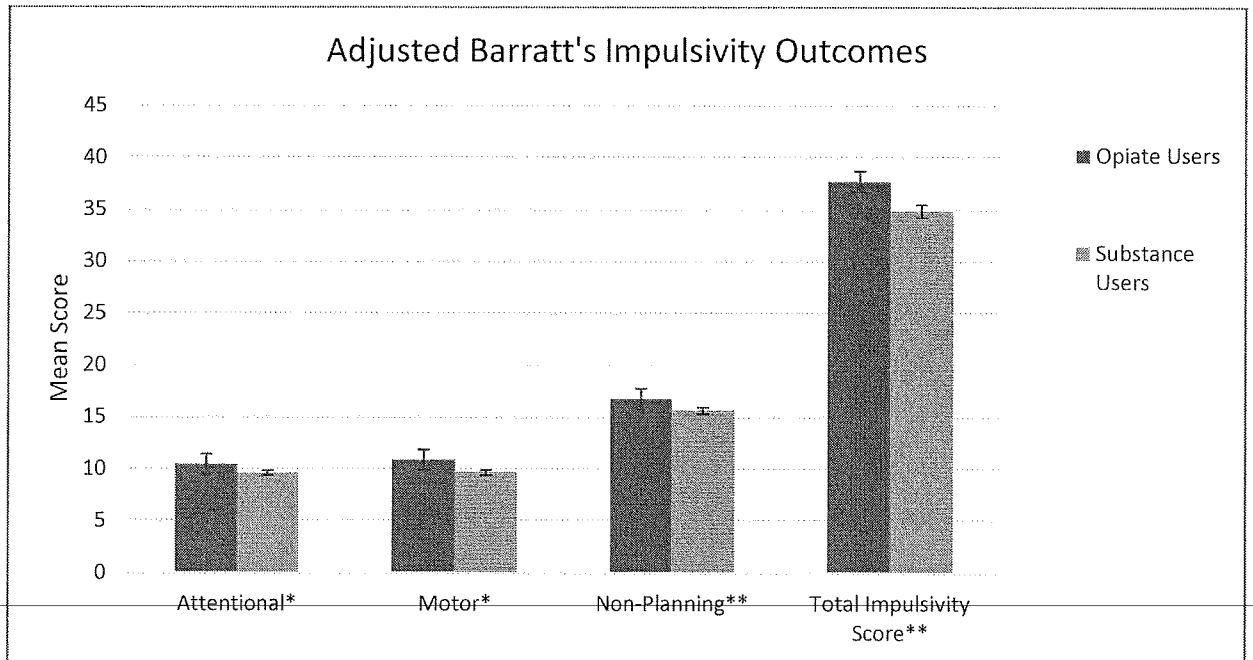
**Table 3. Adjusted Impulsivity Outcomes (N=430)**

	Opiate Users n=97	Substance Users n=333	
<b>Barratt's Impulsivity</b>	<b>M (SE)</b>	<b>M (SE)</b>	<b>p. value</b>
Attentional*	10.44 (0.35)	9.62 (0.23)	0.022
Motor*	10.87 (0.36)	9.67 (0.23)	0.001
Non-Planning**	16.73 (0.49)	15.65 (0.31)	0.024
Total Impulsivity Score**	37.71 (1.0)	34.83 (0.63)	0.003

\* Control for age group, employment group, and number of times in jail

\*\*Control for age group, employment group, number of times in jail, and race group





**Figure 1.** Adjusted Barratt's Impulsivity Outcomes: Opiate Users and Other Substance Users. Attentional Impulsivity and Motor Impulsivity scores \* controlled for age group, employment group, and number of times in jail. Non-Planning Impulsivity score and Total Impulsivity score \*\* controlled for age group, employment group, number of times in jail, and race group. Survey responses of incarcerated men and woman upon commitment between November 2012 and October 2013.

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### Appendix A.

#### Barratt Impulsivity Scale: BIS-11 (Patton, Stanford, Barratt, 1995)

**Directions:** People differ in the ways they act and think in different situations. This is a test to measure some of the ways in which you act and think. Read each statement and put an X on the appropriate circle on the right side of this page. Do not spend too much time on any statement. Answer quickly and honestly.

	Rarely/ Never	Occasionally	Often	Almost Always/ Always
1. I do plan tasks carefully.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I do things without thinking.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I make-up my mind quickly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I am happy-go-lucky.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I don't "pay attention."	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I have "racing" thoughts.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. I plan trips well ahead of time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I am self-controlled.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. I concentrate easily.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. I save regularly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. I "squirm" at plays or lectures.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. I am a careful thinker.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. I plan for job security.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. I say things without thinking.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. I like to think about complex problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. I change jobs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. I act "on impulse."	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. I get easily bored when solving thought problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. I act on the spur of the moment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. I am a steady thinker.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. I change residences.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22. I buy things on impulse.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. I can only think about one thing at a time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. I change hobbies.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25. I spend or charge more than I earn.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

26. I often have extraneous thoughts when thinking.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27. I am more interested in the present than the future.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28. I am restless at the theater or lectures.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29. I like puzzles.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30. I am future oriented.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Attention (5 items): 5, 9\*, 11, 20\*, 28

Motor (7 items): 2, 3, 4, 17, 19, 22, 25

Self-Control (6 items): 1\*, 7\*, 8\*, 12\*, 13\*, 14

Cognitive Complexity (5 items): 10\*, 15\*, 18, 27, 29\*

Perseverance (4 items): 16, 21, 23, 30\*

Cognitive Instability (3 items): 6, 24, 26

**2<sup>nd</sup> Order Factor Item Content**

Attentional Impulsiveness (8 items): 6, 5, 9\*, 11, 20\*, 24, 26, 28

Motor Impulsiveness (11 items): 2, 3, 4, 16, 17, 19, 21, 22, 23, 25, 30\*

Non-planning Impulsiveness (11 items): 1\*, 7\*, 8\*, 10\*, 12\*, 13\*, 14, 15\*, 18, 27, 29\*

\*Reversed item scored 4, 3, 2, 1

**Appendix B.**

**In Prison Drug Contemplation Ladder**

**Please choose ONE of the next ten responses to describe how you feel about your drug use now...** Think about how much you used drugs before you were incarcerated and what you plan to do when you get out. Think of each rung of the ladder as a step closer to being a former drug user. Circle the number that shows which rung you are on.

10	I am committed to not use drugs when I get out
9	I have begun to make changes (for example, talked to friends and family) so I don't use drugs when I get out
8	I plan not to use drugs when I get out
7	I plan not to use drugs that much when I get out
6	I plan to use drugs less than I used to when I get out
5	I often think about changing my drug use, but I have no plans yet to quit when I get out
4	I sometimes think about changing my drug use, but I have no plans yet to quit when I get out
3	I rarely think about changing my drug use, and I have no plans to quit when I get out
2	I do not think about changing my drug use when I get out
1	I have decided to use drugs the same as before (or more) when I get out.

### Appendix C.

Survey questions used:

Question #	Variable
247	Age
248	Race/Ethnicity
251	Education
255	Employment Status
256	Income within last 30 days
148	Marijuana/Hashish
149	Hallucinogens/LSD/PCP/psychedelics/mushrooms
150	Inhalants
151	Crack/Freebase
152	Heroin and cocaine (mixed together as speed ball)
153	Cocaine by itself
154	Heroin by itself
155	Street Methadone (non-prescription)
156	Other opiates/opium/morphine/Demerol
157	Methamphetamines
158	Amphetamines (other uppers)
159	Tranquilizers/barbiturates/sedatives/benzodiazepines (downers)
160	Other drugs
113	Drugs caused in current incarceration
120	Drug contemplation ladder
166	Importance of getting drug treatment
12	I act on impulse
13	I act on the spur of the moment
14	I do things without thinking
15	I say things without thinking
16	I buy things on impulse
17	I plan for job security
18	I plan for the future
19	I save regularly
20	I do plan tasks carefully
21	I am a careful thinker
22	I am restless while in class or at talks
23	I "squirm" at movies or while in class
24	I concentrate easily
25	I don't pay attention
26	I get easily bored when solving thought problems
257	Number of times incarcerated

## Appendix D.

### MUSE Codebook

Question	Variable	Label	Code	Length
<b>Q12.</b>	<b>I act on impulse.</b>			
	<b>BIS1</b>	Q10 act on impulse		1
			<b>0</b> = Rarely/Never	
			<b>1</b> = Occasionally	
			<b>2</b> = Often	
			<b>3</b> = Almost Always/Always	
			<b>7</b> = Don't Know	
			<b>8</b> = Refuse to Answer	
			<b>9</b> = Not Applicable	
<b>Q13.</b>	<b>I act on the spur of the moment.</b>			
	<b>BIS2</b>	Q11 act spur of moment		1
			<b>0</b> = Rarely/Never	
			<b>1</b> = Occasionally	
			<b>2</b> = Often	
			<b>3</b> = Almost Always/Always	
			<b>7</b> = Don't Know	
			<b>8</b> = Refuse to Answer	
			<b>9</b> = Not Applicable	
<b>Q14.</b>	<b>I do things without thinking.</b>			
	<b>BIS3</b>	Q12 do things w/out thinking		1
			<b>0</b> = Rarely/Never	
			<b>1</b> = Occasionally	
			<b>2</b> = Often	
			<b>3</b> = Almost Always/Always	
			<b>7</b> = Don't Know	
			<b>8</b> = Refuse to Answer	
			<b>9</b> = Not Applicable	

- Q15. I say things without thinking.**  
**BIS4** Q13 say things w/out thinking 1
- 0 = Rarely/Never  
 1 = Occasionally  
 2 = Often  
 3 = Almost Always/Always  
 7 = Don't Know  
 8 = Refuse to Answer  
 9 = Not Applicable
- Q16. I buy things on impulse.**  
**BIS5** Q14 buy things on impulse 1
- 0 = Rarely/Never  
 1 = Occasionally  
 2 = Often  
 3 = Almost Always/Always  
 7 = Don't Know  
 8 = Refuse to Answer  
 9 = Not Applicable
- Q17. I plan for job security.**  
**BIS6** Q15 plan for job security 1
- 0 = Rarely/Never  
 1 = Occasionally  
 2 = Often  
 3 = Almost Always/Always  
 7 = Don't Know  
 8 = Refuse to Answer  
 9 = Not Applicable
- Q18. I plan for the future.**  
**BIS7** Q16 plan future 1
- 0 = Rarely/Never  
 1 = Occasionally  
 2 = Often  
 3 = Almost Always/Always  
 7 = Don't Know  
 8 = Refuse to Answer  
 9 = Not Applicable

- Q19. I save regularly.**  
**BIS8** Q17 save 1
- 0 = Rarely/Never  
 1 = Occasionally  
 2 = Often  
 3 = Almost Always/Always  
 7 = Don't Know  
 8 = Refuse to Answer  
 9 = Not Applicable
- Q20. I do plan tasks carefully.**  
**BIS9** Q18 plan carefully 1
- 0 = Rarely/Never  
 1 = Occasionally  
 2 = Often  
 3 = Almost Always/Always  
 7 = Don't Know  
 8 = Refuse to Answer  
 9 = Not Applicable
- Q21. I am a careful thinker.**  
**BIS10** Q19 careful thinker 1
- 0 = Rarely/Never  
 1 = Occasionally  
 2 = Often  
 3 = Almost Always/Always  
 7 = Don't Know  
 8 = Refuse to Answer  
 9 = Not Applicable
- Q22. I am restless while in class or at talks.**  
**BIS11** Q20 restless 1
- 0 = Rarely/Never  
 1 = Occasionally  
 2 = Often  
 3 = Almost Always/Always  
 7 = Don't Know  
 8 = Refuse to Answer  
 9 = Not Applicable

- Q23. I "squirm" at movies or while in classes**  
**BIS12** Q21 squirm 1
- 0 = Rarely/Never  
 1 = Occasionally  
 2 = Often  
 3 = Almost Always/Always  
 7 = Don't Know  
 8 = Refuse to Answer  
 9 = Not Applicable
- Q24. I concentrate easily.**  
**BIS13** Q22 concentrate easy 1
- 0 = Rarely/Never  
 1 = Occasionally  
 2 = Often  
 3 = Almost Always/Always  
 7 = Don't Know  
 8 = Refuse to Answer  
 9 = Not Applicable
- Q25. I don't pay attention.**  
**BIS14** Q23 don't pay attention 1
- 0 = Rarely/Never  
 1 = Occasionally  
 2 = Often  
 3 = Almost Always/Always  
 7 = Don't Know  
 8 = Refuse to Answer  
 9 = Not Applicable
- Q26. I get easily bored when solving thought problems.**  
**BIS15** Q24 easily bored 1
- 0 = Rarely/Never  
 1 = Occasionally  
 2 = Often  
 3 = Almost Always/Always  
 7 = Don't Know  
 8 = Refuse to Answer  
 9 = Not Applicable



**Q113. Using the scale given, how much did drugs cause this incarceration?**

- CAD6** Q111 how much drugs cause this incarceration 1
- 1= Drugs have NOTHING to do with why I'm here
  - 2= Drugs have A LITTLE BIT to do with why I'm here
  - 3= Drugs are PARTLY the reason that I'm here
  - 4= Drugs are MOSTLY the reason that I'm here
  - 5= Drugs are TOTALLY the reason that I'm here
  - 7= Don't Know
  - 8= Refuse to Answer
  - 9= Not Applicable

**Q120. Please choose ONE of the next 10 responses to describe how you feel about your drug use after release. Think about how much you used drugs before you were incarcerated and what you plan to do when you get out. Think of each rung of the ladder as a step closer to being a former drug user. Choose the number that shows which rung you are on:**

- LADDERD** Q118 drug contemplation ladder 2
- 1= I have decided to use drugs the same as before (or more) when I get out
  - 2= I do not think about changing my drug use when I get out
  - 3= I rarely think about changing my drug use, and I have no plans to quit when I get out
  - 4= I sometimes think about changing my drug use, but I have no plans yet to quit when I get out
  - 5= I often think about changing my drug use, but I have no plans to quit when I get out
  - 6= I plan to use drugs less than I used to when I get out
  - 7= I plan not to use drugs that much when I get out
  - 8= I plan not to use drugs when I get out
  - 9= I have begun to make changes (for example, talked to friends and family) so I don't use drugs when I get out
  - 10= I am committed to not use drugs when I get out
  - 97= Don't Know
  - 98= Refuse to Answer
  - 99= Not Applicable

**Q121. Alcohol use is why I'm here****CAA1** Q119 alcohol use is why I'm here 1

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Neither agree nor disagree
- 4 = Agree
- 5 = Strongly agree
- 7 = Don't Know
- 8 = Refuse to Answer
- 9 = Not Applicable

**Q146. During the last 12 months before being locked up, which drug caused the most serious problem?****TCU10** Q144 drug causing most problems 2

- 0 = none
- 1 = Alcohol
- 2 = Marijuana/Hashish
- 3 =  
Hallucinogens/LSD/PCP/psyched  
elics/mushrooms
- 4 = Inhalants
- 5 = Crack/Freebase
- 6 = Heroin and cocaine (mixed together as  
speedball)
- 7 = Cocaine (by itself)
- 8 = Street Methadone (non-prescription)
- 9 = Heroin (by itself)
- 10 = Other opiates/opium/morphine/Demerol
- 11 = Methamphetamines
- 12 = Amphetamines (other uppers)
- 13 =  
Tranquilizers/barbiturates/sedati  
ves/Benzodiazepines (downers)
- 97 = Don't Know
- 98 = Refuse to Answer
- 99 = Not Applicable

- Q148. Marijuana/Hashish**  
**TCU11B** Q146 marijuana/hashish 1
- 0 = Never  
1 = Only a few times  
2 = 1-3 times a month  
3 = 1-5 times a week  
4 = About everyday  
7 = Don't Know  
8 = Refuse to Answer  
9 = Not Applicable
- Q149. Hallucinogens/LSD/PCP/psychedelics/mushrooms**  
**TCU11C** Q147 hallucinogens/LSD/PCP/psychedelics/mushrooms 1
- 0 = Never  
1 = Only a few times  
2 = 1-3 times a month  
3 = 1-5 times a week  
4 = About everyday  
7 = Don't Know  
8 = Refuse to Answer  
9 = Not Applicable
- 
- Q150. Inhalants**  
**TCU11D** Q148 Inhalants 1
- 0 = Never  
1 = Only a few times  
2 = 1-3 times a month  
3 = 1-5 times a week  
4 = About everyday  
7 = Don't Know  
8 = Refuse to Answer  
9 = Not Applicable
- Q151. Crack/Freebase**  
**TCU11E** Q149 crack/Freebase 1
- 0 = Never  
1 = Only a few times  
2 = 1-3 times a month  
3 = 1-5 times a week  
4 = About everyday  
7 = Don't Know  
8 = Refuse to Answer  
9 = Not Applicable

- Q152. Heroin and cocaine (mixed together as speed ball)**  
**TCU11F** Q150 heroin and cocaine 1
- 0= Never  
1= Only a few times  
2= 1-3 times a month  
3= 1-5 times a week  
4= About everyday  
7= Don't Know  
8= Refuse to Answer  
9= Not Applicable
- Q153. Cocaine (by itself)**  
**TCU11G** Q151 cocaine 1
- 0= Never  
1= Only a few times  
2= 1-3 times a month  
3= 1-5 times a week  
4= About everyday  
7= Don't Know  
8= Refuse to Answer  
9= Not Applicable
- 
- Q154. Heroin (by itself)**  
**TCU11H** Q152 heroin 1
- 0= Never  
1= Only a few times  
2= 1-3 times a month  
3= 1-5 times a week  
4= About everyday  
7= Don't Know  
8= Refuse to Answer  
9= Not Applicable
- Q155. Street Methadone (non-prescription)**  
**TCU11I** Q153 street meth 1
- 0= Never  
1= Only a few times  
2= 1-3 times a month  
3= 1-5 times a week  
4= About everyday  
7= Don't Know  
8= Refuse to Answer  
9= Not Applicable

- Q156. Other opiates/opium/morphine/Demerol**  
**TCU11J** Q154 opiates 1
- 0= Never  
1= Only a few times  
2= 1-3 times a month  
3= 1-5 times a week  
4= About everyday  
7= Don't Know  
8= Refuse to Answer  
9= Not Applicable
- Q157. Methamphetamines**  
**TCU11K** Q155 meth 1
- 0= Never  
1= Only a few times  
2= 1-3 times a month  
3= 1-5 times a week  
4= About everyday  
7= Don't Know  
8= Refuse to Answer  
9= Not Applicable
- 
- Q158. Amphetamines (other uppers)**  
**TCU11L** Q156 amphetamines 1
- 0= Never  
1= Only a few times  
2= 1-3 times a month  
3= 1-5 times a week  
4= About everyday  
7= Don't Know  
8= Refuse to Answer  
9= Not Applicable
- Q159. Tranquilizers/barbiturates/sedatives/Benzodiazepines (downers)**  
**TCU11M** Q157 downers 1
- 0= Never  
1= Only a few times  
2= 1-3 times a month  
3= 1-5 times a week  
4= About everyday  
7= Don't Know  
8= Refuse to Answer  
9= Not Applicable

<b>Q166.</b>	<b>How important is it for you to get drug treatment now?</b>		
	<b>TCU15</b>	Q164 importance of getting drug treatment	1
		<b>0</b> = Not at all <b>1</b> = Slightly <b>2</b> = Moderately <b>3</b> = Considerably <b>4</b> = Extremely <b>7</b> = Don't Know <b>8</b> = Refuse to Answer <b>9</b> = Not Applicable	
<b>247.</b>	<b>In what year were you born?</b>		
	<b>YEARBORN</b>	Q245 age	4
		<b>Unlimited - Unlimited</b> = yyyy <b>97</b> = Don't Know (Year) <b>98</b> = Refuse to Answer (Year) <b>99</b> = Not Applicable (Year)	
<b>248.</b>	<b>Which of these best describe your race and ethnicity?</b>		
	<b>RACEETH</b>	Q246 ethnicity	2
		<b>1</b> = White (not Hispanic) <b>2</b> = Black (not Hispanic) <b>3</b> = Hispanic White <b>4</b> = Hispanic Black <b>5</b> = Hispanic other <b>6</b> = Native American or Native Alaskan <b>7</b> = Asian or Pacific Islander <b>8</b> = Bi-Racial or Multi-Ethnic <b>9</b> = Other (Write in)	
		<b>97</b> = Don't Know <b>98</b> = Refuse to Answer <b>99</b> = Not Applicable	

**251. What is the highest grade of school you completed?****EDU** Q249 education level

2

- 0 = 6th Grade or less
- 1 = 7h Grade
- 2 = 8th Grade
- 3 = 9th Grade
- 4 = 10th Grade
- 5 = 11th Grade
- 6 = 12th Grade Finished High School
- 7 = 1 Year of College
- 8 = 2 Years of College
- 9 = 3 Years of College
- 10 = 4 Years of College
- 11 = Graduate or Advance degree
- 97 = Don't Know
- 98 = Refuse to Answer
- 99 = Not Applicable

**255. Which of the following best describes your employment status before you came to the ACI?****EMPLOY** Q253 employment prior to aci

1

- 1 = Employed full-time
- 2 = Unemployed
- 3 = Homemaker
- 4 = Retired
- 5 = Student
- 6 = Employed part-time
- 7 = Don't Know
- 8 = Refuse to Answer
- 9 = Not Applicable

**256. In the last 30 days prior to this incarceration, how much money did you receive from all sources including employment, spouse, retirement, disability or other activities either legal or illegal?****INCOME** Q254 income prior to aci

6

- 0 - 100000 = range
- 999997 = Don't Know
- 999998 = Refuse to Answer
- 999999 = Not Applicable

**257. Including this time, how many times have you been incarcerated (prison/jail)?**

**DEMO10** Q255 # time incarcerated

3

**0 - 100** = range

**997** = Don't Know

**998** = Refuse to Answer

**999** = Not Applicable

End