

Spring 4-15-2016

# The Influence of Doctoral Psychology Trainees' Personal Cannabis Use, Perceptions of Cannabis' Risks, and Attitudes Toward Substance Use on Ability to Identify Cannabis Use Disorder

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DISSERTATION:  
THE INFLUENCE OF DOCTORAL PSYCHOLOGY TRAINEES' PERSONAL CANNABIS  
USE, PERCEPTIONS OF CANNABIS' RISKS, AND ATTITUDES TOWARD SUBSTANCE  
USE ON ABILITY TO IDENTIFY CANNABIS USE DISORDER

BY

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Submitted in Partial Fulfillment  
of the Requirements for the Degree of  
Doctor of Philosophy in Counseling Psychology

Submitted April 15, 2016

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**SETON HALL UNIVERSITY**  
**COLLEGE OF EDUCATION AND HUMAN SERVICES**  
**OFFICE OF GRADUATE STUDIES**

**APPROVAL FOR SUCCESSFUL DEFENSE**

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## Abstract

The incidence of cannabis use disorder is increasing across the United States as a function of increased cannabis use (Hasin et al., 2015); accordingly, it is critical that mental healthcare professionals be able to accurately identify cannabis use disorder. In light of this imperative, the current study explored potential barriers to diagnosing cannabis use disorder among doctoral psychology trainees. Participants ( $N = 123$ ) were doctoral students in clinical psychology, counseling psychology, and related disciplines. Utilizing a quasi-experimental analogue design, the study examined whether doctoral psychology trainees' personal cannabis use predicted their perceptions of the risks of cannabis use and attitudes toward substance use. Additionally, the study explored whether doctoral psychology trainees' personal cannabis use histories, perceptions of cannabis' risks, and attitudes toward substance use would predict accurate diagnosis of cannabis use disorder. A series of t-tests revealed that trainees' beliefs about the risks of cannabis use and attitudes toward substance use varied with history and recency of personal cannabis use. Additionally, partial correlation analyses revealed that doctoral psychology trainees' perceptions of cannabis' risks were negatively correlated with select attitudes toward substance use. Despite these findings, the study found that none of the attitudes explored significantly predicted diagnostic decisions among trainees. Additionally, contrary to study hypotheses, current cannabis use among doctoral psychology trainees increased the likelihood that trainees would accurately make a diagnosis of cannabis use disorder. Implications for graduate training, clinical practice, and public health are considered and recommendations for future research are provided.

*Keywords:* cannabis, marijuana, cannabis use disorder, psychology training, cognitive dissonance, bias, clinical judgment, diagnosis, assessment

This dissertation is dedicated to the memory of my grandmother, Hedy Stratyner.  
Grandma, you are with me every day. Thank you for teaching me to listen to people's stories, for showing me the meaning of empathy through your actions, and for instilling in me compassion for and curiosity about all living things – human beings included – that continues to inspire me today.

## Acknowledgements

In a funny way, writing this section of my dissertation has felt more difficult than any other part of the dissertation process, as there are so many people I wish to thank. I consider myself fortunate to have so many in my life who have mentored me, supported me, made me smile, made me think, and believed in me throughout this process.

First and foremost, I wish to thank my dissertation advisor, Dr. Laura Palmer, and committee members Drs. John Smith, Brian Cole, and Margaret Farrelly. Dr. Farrelly, it has been a pleasure to work with you. Your commitment as a member of my dissertation committee even in the face of difficulty did not go unnoticed, and I appreciate it more than I can say.

Dr. Cole, your love for teaching future psychologists is evident to everyone who knows you and deeply appreciated by all of your students. Thank you for reminding me of my strengths at times when it was difficult to see them in myself.

Special thanks are due to Dr. John Smith, without whom it's arguable I would not be here today. To borrow the words of a wise man who loves Dr. Smith as much as I do, you are "a sweet, intelligent, sensitive, competent man." Thank you for your support throughout my doctoral studies. Your students – past, present, and future – are very lucky to have you in their lives.

Dr. Palmer, I really don't even know where to begin. Suffice it to say, I cannot imagine the last five years without you. Your dedication to your students is unmatched. From Winchester to Trinidad to internship applications to my dissertation defense, I have you to thank for it all. Thank you for hanging in there with me when you didn't have to, and for everything.

In addition to those faculty members who so graciously served as members of my dissertation committee, as well as my advisor, I would like to thank Don McMahon, without whom this dissertation would not have been possible. Don, your passion for statistics was at times mindboggling to me, but simultaneously contagious. Thank you for our many conversations, for your wisdom, and for restoring my enthusiasm in the research process at key moments.

Thanks are also due to the following supervisors, advisors, and mentors who have inspired me throughout my studies and will continue to inspire me in all of my future endeavors: Dr. Mary Jane Alexander, Dr. George Alexopoulos, Dr. Ben Beitin, Dr. Margaret Brady-Amoon, Dr. Christina Doherty, Aviva Fisher, Dr. Pamela Foley, Dr. Ismini Georgiades, Dr. Ingrid Grieger, Dr. Faith Gunning-Dixon, Dr. Leora Heckelman, Dr. Rob Henderson, Dr. Dimitris Kiosses, Dr. Joe Manera, Dr. Kevin Manning, Dr. Patricia Marino, Dr. Jennifer McKelvey, Dr. Andrew Merling, Dr. Lauren Myers, Dr. Leslie Rescorla, Dr. Paul Rinaldi, Dr. Joe Ruggiero, Dr. Vijayeta Sinh, Dr. Cheryl Thompson Sard, Dr. Susan Tross, Dr. Andrew Twardon, Dr. Lucia Vail, and Dr. Rob Wozniak.

Thank you to Lucy Vazquez, whose help throughout my studies at Seton Hall was essential (also, for always having candy on your desk at just the right times).

To my colleagues at Seton Hall, throughout my externships, and on internship, thank you for

sharing this experience with me, and for your support (and senses of humor) through this process. I feel grateful to call such good people both my colleagues and friends.

To my longtime friends: Thank you being my cheering squad along the way. You have played a greater role in getting me here than you realize. I promise I will keep my word on all of those rain checks.

Many thanks are owed to my loving extended family, including Joanie, Allen, and Sarah Stratyner; Anne Greene; Meg Greene; Gregory Katz; Kim Katz; Bob Greene; Molly Greene; Zoe Greene; and the rest of my extended family. Thanks are also due to those who might as well be family – Sally Anne Levine, Deena and Matt Scherer, Phyllis Little, Dr. Michael Behar, Mike Levine, Leslie Anders, Dylan Levine, and the rest of the Anders and Levine families. I am incredibly fortunate to have each of you in my life.

To my mom, Dr. Lynn Anne Greene Stratyner: Mom, I am so proud of you and so proud to be your daughter. You always have and continue to impress and amaze me with your strength. Thank you for always reminding me that “perfect is the enemy of good enough” just when I need it the most. I love you in the whole best world.

To my dad, Dr. Harris Stratyner: Who would have thought at all those Saturday morning breakfasts at Mount Parnasse Diner that we’d be here today? Thank you for introducing me to my life’s work, and more importantly, for your love and support through everything. I am very proud to be following in your footsteps, and even more proud just to be your kid. We can keep fighting about which one of us loves each other more if you insist.

Finally, to Zachary Levine. Zac, I cannot imagine having done this without you, and more importantly, I cannot imagine my life without you. I love you very, very much.



## Table of Contents

Abstract.....	iv
Acknowledgements.....	vi
Table of Contents.....	viii
List of Tables.....	xi
List of Appendices.....	xii
Chapter I – INTRODUCTION.....	1
Cannabis Use Disorder.....	6
Influence of Personal Attitudes and Behavior on Professional Judgment.....	7
Statement of the Problem.....	9
Limitations of Existing Studies.....	10
Definition of Terms.....	11
Research Questions.....	12
Statement of Hypotheses.....	13
Delimitations.....	14
Chapter II – LITERATURE REVIEW.....	16
Cannabis Use Disorder.....	18
Identification of Cannabis Use Disorder.....	19
Training in Identification of Substance Use Disorders.....	20
Attitudes.....	21
Public Perceptions of Cannabis.....	22
Attitudes Toward Cannabis and Substance Use Among Healthcare Professionals.....	23
Behavior.....	27
Festinger’s (1957) Theory of Cognitive Dissonance.....	28
Cognitive Dissonance and Substance Use.....	29
Cognitive Dissonance and the Healthcare Professional.....	31
Healthcare Professionals’ Cannabis Use.....	35
Summary and Conclusions.....	37
Limitations of Existing Studies.....	37
The Current Study.....	39
Chapter III – METHODOLOGY.....	40
Research Design.....	42
Participants and Sample Characteristics.....	42
Procedures.....	50
Instruments.....	54
Cannabis Use Problems Identification Test.....	54
Perceptions of Cannabis Use Risks Questionnaire.....	55
Substance Abuse Attitude Survey.....	56
Chapter IV – RESULTS.....	59
Data Screening and Preliminary Analyses.....	62

Hypothesis 1.....	66
Hypothesis 1a.....	67
Hypothesis 1b.....	67
Hypothesis 1c.....	68
Hypothesis 2.....	68
Hypothesis 2a.....	68
Hypothesis 2b.....	69
Hypothesis 2c.....	69
Hypothesis 2d.....	69
Hypothesis 2e.....	70
Hypothesis 2f.....	70
Hypothesis 2g.....	71
Hypothesis 2h.....	71
Hypothesis 2i.....	71
Hypothesis 3.....	72
Hypothesis 4.....	73
Model 1.....	74
Model 2.....	75
Model 3.....	77
Post Hoc Analyses.....	81
 Chapter V – DISCUSSION.....	 89
Results of Hypotheses.....	89
Hypothesis 1.....	89
Hypothesis 2.....	91
Influence of Cannabis Use History on Permissiveness – Hypotheses 2a, 2e, and 2h.....	92
Influence of Cannabis Use History on Non-Stereotyping – Hypotheses 2c, 2f, and 2i.....	93
Influence of Cannabis Use History on Non-Moralism – Hypotheses 2b, 2d, and 2g.....	94
Additional considerations for Hypothesis 2: Statistical versus practical significance.....	95
Hypothesis 3.....	96
Hypothesis 4.....	97
Role of perceptions of cannabis’ risks and attitudes toward substance use in the prediction of cannabis use disorder diagnosis.....	98
Role of current cannabis use in the prediction of cannabis use disorder diagnosis.....	98
“Personal experience as professional advantage” hypothesis.....	100
Latent variable hypothesis.....	104
Minimizing bias hypothesis.....	105
Influence of Graduate Training in Substance Use Disorders.....	108
Implications.....	109
Strengths and Limitations.....	114
Future Directions for Research.....	120

Conclusions.....	123
References.....	125
Appendices.....	142

## List of Tables

Table 3.1	Means, Standard Deviations, Frequencies, and Percentages of Participant Demographics.....	45
Table 3.2	Frequencies and Percentages of Sample Training Characteristics.....	47
Table 3.3	Participants' Substance Use Disorder Training Characteristics as Frequencies and Percentages.....	49
Table 4.1	Means, Standard Deviations, and Correlations for Scores on the PCURQ P-SAAS, NM-SAAS, and NS-SAAS.....	63
Table 4.2	Summary of Partial Correlation Results for Scores on the PCURQ, P-SAAS, NM-SAAS, and NS-SAAS.....	73
Table 4.3	Results of Logistic Regression Analysis for Hypothesis 4, Model 1 (Prediction of Diagnostic Decision by Perceptions of Cannabis' Risks and Attitudes Toward Substance Use).....	75
Table 4.4	Results of Hierarchical Logistic Regression Analysis for Hypothesis 4, Model 2 (Prediction of Diagnostic Decision by Perceptions of Cannabis' Risks, Attitudes Toward Substance Use, and Cannabis Use History).....	77
Table 4.5	Results of Hierarchical Logistic Regression Analysis for Hypothesis 4, Model 3 (Prediction of Diagnostic Decision by Perceptions of Cannabis' Risks, Attitudes Toward Substance Use, and Cannabis Use History, with Demographic Variables Controlled).....	80
Table 4.6	Results of Hierarchical Logistic Regression for Post Hoc Analysis 1 (Influence of Substance Use Disorder Training History on the Predictive Ability of Logistic Regression Model 3).....	84
Table 4.7	Results of Hierarchical Logistic Regression for Post Hoc Analysis 2 (Influence of Intensive Substance Use Disorder Training History on the Predictive Ability of Logistic Regression Model 3).....	88

## List of Appendices

Appendix A	Letter of Solicitation (for Snowball Sampling Distribution).....	142
Appendix B	Letter of Solicitation (for Distribution to Doctoral Program Training Directors).....	144
Appendix C	Demographic Information.....	147
Appendix D	Vignette Depicting Cannabis Use Disorder.....	149
Appendix E	Questions about Cannabis Use.....	150
Appendix F	Cannabis Use Problems Identification Test (CUPIT).....	151
Appendix G	Perceptions of Cannabis Use Risks Questionnaire (PCURQ).....	152
Appendix H	Substance Abuse Attitude Survey (SAAS).....	153
Appendix I	Substance Use Disorders Training Survey Question.....	154
Appendix J	Demographic Variable Taxonomy.....	155
Appendix K	Permission to Adapt Questionnaire Originally Used in Kondrad & Reid (2013).....	156
Appendix L	Permission to Reprint Items from Kondrad & Reid (2013).....	157
Appendix M	Permission to Use the Substance Abuse Attitude Survey (SAAS; Chappel et al., 1985).....	158

## CHAPTER I

### Introduction

According to the Substance Abuse and Mental Health Services Administration (SAMHSA; 2013b), cannabis is the most commonly used illicit substance in the United States. National statistics indicate that 18.9 million, or 7.3 percent of Americans ages 12 and older report that they used cannabis within the past month, compared to cocaine users (0.6 percent of the population), heroin users (0.3 percent of the population), methamphetamine users (0.2 percent of the population), and recreational prescription drug users (2.6 percent of the population; SAMHSA, 2013b). In addition to being the most commonly used illicit substance, data suggests that recreational cannabis use is on the rise among individuals 12 and older; SAMHSA (2013b) reports that recreational cannabis use increased from 14.5 million users (5.8 percent of the population) to 18.9 million users between 2007 and 2012. According to the Pew Research Center (2013), 48 percent of adults report that they have used cannabis at least once, the highest percentage of United States adults to ever endorse a history of cannabis use.

Increases in the prevalence of recreational cannabis use in the United States in recent years accompany a larger shift in cultural attitudes and beliefs about cannabis use, not only among those who report current or past use of cannabis, but among those who have never tried the drug (Galston & Dionne Jr., 2013). According to the Pew Research Center (2013), support for the legalization of cannabis has increased among “all demographic and political groups” (p. 4) in the United States, including men and women; individuals who identify as Caucasian, Black, and Hispanic; adults in every age bracket (18-29, 30-49, 50-64, and 65+); individuals of all education levels; and among members across every major political group. Although this shift cannot be entirely accounted for by changing beliefs about the harmfulness of cannabis (e.g.,

many Americans, despite harboring concerns about the safety of cannabis use, may support the legalization of recreational cannabis because they believe that criminalization of cannabis is ineffective or discriminatory, or because legal cannabis sales would produce tax revenue; Galston & Dionne Jr., 2013), it appears that the perceived risk of cannabis use is declining among Americans. Fifty-eight percent of Americans disagree with the gateway hypothesis, the notion that cannabis use among adolescents leads to use of more dangerous illicit substances (Pew Research Center, 2013). Additionally, according to Galston and Dionne Jr. (2013), recent surveys have indicated that a “slim majority” (p. 1) of Americans now believe that cannabis is less dangerous than alcohol. In one such survey of 1,000 American adults, conducted by *NBC News* and *The Wall Street Journal* (2014), when asked which substance – tobacco, alcohol, cannabis, or sugar – is the most harmful to a person’s health, 49 percent said tobacco, 24 percent said alcohol, and 15 percent said sugar, compared to eight percent who selected cannabis. A second survey, conducted by the Pew Research Center (2014), found that 69 percent of the public believes that alcohol is more harmful to individuals’ health than cannabis, while 63 percent view alcohol as more harmful to society than cannabis. Indeed, in a January 2014 interview in *The New Yorker*, even President Barack Obama was quoted as saying “I don’t think [cannabis] is more dangerous than alcohol,” (Remnick, 2014, para. 76). Although the percentage of Americans who believe that cannabis use can lead to abuse or dependence is unknown, anecdotal evidence suggests that many adolescents and adults believe that cannabis is not addictive (Office of National Drug Control Policy, n.d.; Szalavitz, 2010).

As Americans’ attitudes toward cannabis use have shifted, so too has the legal landscape. As of February 26, 2014, when the current study was initially proposed, 20 states and the District of Columbia had passed legislation legalizing the prescription, sale, and use of cannabis to treat

medical conditions (compared to four states in which medical cannabis legislation failed to pass; Procon.org, 2014), an additional 13 states were debating pending legislation or ballot measures which would legalize medical cannabis (Procon.org, 2014), and possession of cannabis had been decriminalized in 17 states, with decriminalization legislation pending in the District of Columbia (Selway, 2014). Most notably, in November 2012, two states – Colorado and Washington – legalized the distribution, sale, and possession of cannabis for recreational use by adults 21 years of age or older (Healy, 2012). The legalization of recreational cannabis in these two states marks the first time since 1937, when the federal government passed the Marijuana Tax Act, that the sale and distribution of marijuana to private citizens for recreational purposes has effectively been legal (although cannabis use is still prohibited by federal law, the United States Justice Department has not blocked legislation from taking effect in Colorado or Washington, and Department of Justice documents indicate that the federal government will not prosecute cannabis distributors in either state assuming that certain enforcement and regulation guidelines are met; Cole, 2013; Slaughter, 1988).

There is conflicting evidence on the impact of medical cannabis legalization efforts on cannabis use among Americans. While some studies (Cerdá, Wall, Keyes, Galea, & Hasin, 2012; Wall et al., 2011) have demonstrated that recreational cannabis use is more common in states where medical cannabis has been legalized, select studies exploring the nature of this relationship have indicated that prevalence of cannabis use precedes and predicts the legalization of medical cannabis (as opposed to medical cannabis legalization resulting in increased cannabis use) and that the relationship between medical cannabis legalization and recreational cannabis use disappears if other factors are controlled (Gorman & Huber Jr., 2007; Harper, Strumpf, & Kaufman, 2012; Khatapoush & Hallfors, 2004). Conversely, other studies have found that



cannabis use does increase following the passage of medical cannabis legislation (Cerdá et al., 2012). A recent study conducted by Pacula, Powell, Heaton and Sevigny (2013) suggests that these discrepancies may be accounted for by the fact that medical cannabis legislation is not uniform, and that states in which medical cannabis laws explicitly allow for the creation of medical cannabis dispensaries, include provisions which provide legal protection for dispensaries, and/or allow home cultivation of cannabis are associated with increased cannabis use. Even in studies that have refuted the hypothesized link between medical cannabis legalization and increased recreational cannabis use, legalization is nonetheless associated with a decrease in the perceived harmfulness of cannabis (Khatapoush & Hallfors, 2004). Additionally, although no studies to date have explored the impact of recreational cannabis legalization on use of the drug in Colorado and Washington, a study which explored the impact of commercialization of cannabis in the Netherlands on cannabis use found that the de facto legalization of cannabis led to a steep increase in self-reported cannabis use among 18- to 20-year-olds, from 15 percent to 44 percent (MacCoun & Reuter, 2001). According to MacCoun and Reuter (2001),

Recent experience with legalized gambling [in the United States], as well as the difficulty of suppressing cigarette promotion, added to the post-World War II erosion of repeal's liquor controls, all suggest legal commercial interests are likely to weaken regulatory efforts... If, even with relatively tight regulation, The Netherlands saw a large increase in marijuana prevalence, US [legalization] might lead to very high prevalence rates indeed.

(p. 127)

As states legalize medical and recreational cannabis, the accessibility of cannabis has increased, both through legal channels and illegal or legally dubious channels. Research in

Colorado following the legalization of medical cannabis, but prior to the legalization of recreational cannabis, found that approximately 74 percent of adolescents in substance abuse treatment in the Denver area had obtained cannabis from someone with authorization to use cannabis for medical purposes, indicating that the diversion of medical cannabis for recreational use is widespread (Salomonsen-Sautel, Sakai, Thurstone, Corley, & Hopfer, 2012). Additionally, some reports have indicated that dispensaries in states where medical cannabis is legal are operating illegally under the guise of this legislation, selling medical cannabis authorization cards and cannabis itself to individuals who do not need cannabis for medical treatment (Martin, 2009). Indeed, in certain areas of California and Colorado, medical cannabis dispensaries are believed to outnumber Starbucks coffee shops (Dickinson, 2011; Martin, 2009).

As the belief that cannabis is harmful decreases among Americans and access to and use of cannabis increases, so too will the incidence of cannabis use disorder. Approximately 7.6 million Americans report that they use cannabis on a daily or near-daily basis (SAMHSA, 2013b). Although not all people who use cannabis at some point in time will eventually meet criteria for cannabis use disorder, it is estimated that approximately nine percent of individuals who try cannabis will eventually develop dependence (Anthony, 2006; Anthony, Warner, & Kessler, 1994); this number increases to 17 percent among individuals who first use cannabis during adolescence (Anthony, 2006), and between 33 and 50 percent among daily users (Hall & Pacula, 2003). Lifetime prevalence of cannabis dependence is four percent in the United States (Anthony et al., 1994). Of the 7.3 million people ages 12 and older who met criteria for substance abuse or dependence in 2012, 4.3 million (approximately 1.7 percent of the total population ages 12 and older) met criteria for cannabis use disorder (SAMHSA, 2013b). In 2012, 957,000 people received treatment for cannabis use disorder, more than the number who sought

treatment for cocaine, tranquilizer, heroin, hallucinogen, or stimulant use disorders, and approximately equal to the number who sought treatment for pain reliever abuse/dependence (SAMHSA, 2013b). As cannabis becomes more accessible, both by way of medical and recreational legalization, it is anticipated that the percentage of Americans who meet criteria for and require treatment of cannabis use disorders will continue to rise (Cerdá et al., 2012; Pacula et al., 2013).

### **Cannabis Use Disorder**

According to the *Diagnostic and Statistical Manual of Mental Disorders (DSM-5;* American Psychiatric Association, 2013), cannabis use disorder is defined as “a problematic pattern of cannabis use leading to clinically significant impairment or distress... occurring within a 12-month period,” (p. 509). Despite the American Psychiatric Association’s inclusion of cannabis use disorder in the *DSM-5*, criteria for cannabis use disorder are, for the most part, subjective. At present, there is no consensus regarding how much cannabis must be consumed, or how frequently cannabis must be used in order to qualify for a diagnosis of cannabis use disorder (Alexander, 2003). Without objective criteria to assist healthcare professionals in diagnosing cannabis use disorder, it is likely that these diagnoses may be influenced by mental health professionals’ personal judgments about what patterns of behavior indicate problem cannabis use, especially if clients seeking mental healthcare are in denial about their problem cannabis use or do not attribute their cannabis use to be the cause of their presenting concerns, which is common among individuals with cannabis use problems (American Psychiatric Association, 2013).

Among those healthcare professionals who are expected to be competent in the diagnosis of cannabis use disorder are clinical and counseling psychologists, as well as clinical and

counseling doctoral psychology trainees. Doctoral psychology trainees frequently complete practicum and pre-doctoral internships in settings in which they are likely to encounter individuals with substance use issues, including cannabis use disorder; accordingly, it is imperative that doctoral psychology trainees are knowledgeable about cannabis use disorder and able to accurately identify cannabis use disorder among clients. Despite this, research has repeatedly demonstrated that doctoral psychology trainees in professional psychology fields, including clinical and counseling psychology, receive minimal to no formal training in substance use disorder treatment (Aanavi, Taube, Ja, & Duran, 1999; Chiert, Gold, & Taylor, 1994; da Silva Cardoso, Pruett, Chan, & Tansey, 2006; Lubin, Brady, Woodward, & Thomas, 1986; Madson, Bethea, Daniel & Necaise, 2008; Selin & Svanum, 1981).

### **Influence of Personal Attitudes and Behavior on Professional Judgment**

In lieu of formalized training on cannabis use disorder or conclusive evidence documenting the risks and benefits of cannabis use, research has suggested that healthcare professionals defer to their personal attitudes toward cannabis use and substance use generally when making professional decisions. To date, no studies have explored the impact of psychologists' or doctoral psychology trainees' personal attitudes toward cannabis, or the impact that these attitudes may have on their ability to identify cannabis use disorder; however, a small body of literature has explored this phenomenon among physicians. In one such study, conducted in 1989 by Linn, Yager, and Leake, physicians' personal religious and political beliefs, as well as their perception of the severity of the United States' "drug problem" (p. 715) were associated with their attitudes toward the decriminalization and legalization of cannabis for recreational use. Another study, conducted by Charuvastra, Friedmann, and Stein (2005), found that physicians' attitudes toward substance use – specifically, their permissiveness and non-moralism toward

substance use – significantly predicted their support for the legalization of medical cannabis.

Personal attitudes toward cannabis use do not only impact clinical judgment; they also, in turn, impact provision of services. In a study of family physicians practicing in Colorado, for example, physicians who had recommended medical cannabis to their patients were more likely to believe that cannabis use was associated with significant physical health benefits and to support the legalization of recreational cannabis (Kondrad & Reid, 2013). Likewise, in a study conducted by Norberg et al. (2012) in Australia, nurses and physicians who believed that cannabis should not be available for medical use were 2.06 times more likely to report that they had screened someone for cannabis use in the past month than study participants who supported the legalization of medical cannabis, suggesting that healthcare professionals' personal beliefs about cannabis impact their the provision of services to patients.

Social psychology research has indicated that attitudes are likely to predict behavior when they are formed through personal experience (Cooke & Sheeran, 2004; Glasman & Albarracín, 2006; Kraus, 1995). Healthcare professionals are not immune to this phenomenon. Research has indicated that healthcare professionals who may have alcohol use problems tend to minimize patients' problematic alcohol use, resulting in a failure to intervene with patients who may have substance use disorders (Aalto & Seppa, 2007; Geirsson, Hensing, & Spak, 2009).

As with alcohol use, studies suggest that healthcare professionals' personal cannabis use appears to influence professionals' clinical practices when it comes to assessing for cannabis use, as well as their judgments of the benefits and harms of cannabis use. In one such study, physicians who reported current or past use of cannabis were more likely to favor the legalization or decriminalization of cannabis than those who denied cannabis use (Linn et al., 1989). Additionally, in a study of Colorado family physicians by Kondrad and Reid (2013),

physicians who reported personal cannabis use and who indicated that their personal cannabis use influenced their decision to recommend cannabis to patients were significantly less likely to believe that cannabis is addictive, that using cannabis poses mental health risks, and that physicians who prescribe cannabis should have an ongoing relationship with the patients to whom they prescribe this drug than physician respondents who did not report personal cannabis use. Using the framework of Festinger's (1957) Theory of Cognitive Dissonance, the current study posited that personal cannabis use may lead healthcare professionals – specifically, doctoral psychology trainees – to minimize signs of cannabis use in clients, resulting in a failure to recognize cannabis use disorder.

### **Statement of the Problem**

Paradoxically, as cannabis use – and in turn, cannabis use disorder – becomes more frequent, it is less likely to be seen as a potential problem by the general public. As such, it is critical that mental healthcare professionals – particularly the next generation of mental healthcare professionals, who will inevitably see increasing rates of cannabis use disorder – be able to accurately identify problem cannabis use. Through the use of a vignette depicting cannabis use disorder in a hypothetical client, the current study explored the impact of doctoral psychology trainees' perceptions of cannabis' risks, attitudes toward substance use, and personal cannabis use on trainees' ability to identify cannabis use disorder. Participants were doctoral students in clinical, counseling, and other applied psychology training programs who read a vignette which portrayed a hypothetical client who met *DSM-5* (American Psychiatric Association, 2013) criteria for cannabis use disorder and were asked to identify whether, based on their own judgment, the client met criteria for cannabis use disorder. Participants also completed a series of questions about their own cannabis use, as well as a screening measure of

problem cannabis use, an assessment of perceptions of harm related to cannabis use, and a measure of attitudes related to substance use generally. The goal of the study was twofold: First, the study sought to identify whether doctoral psychology trainees' personal cannabis use predicted their perceptions of the risks of cannabis use and attitudes toward substance use generally. Second, the study sought to explore whether doctoral psychology trainees' personal cannabis use, beliefs about the risk of harm from cannabis, and non-moralistic, permissive, and non-stereotypical attitudes toward substance use predicted their ability to identify cannabis use disorder.

### **Limitations of Existing Studies**

To date, no studies have explored psychologists' or doctoral psychology trainees' personal use of cannabis, or their beliefs about the risk of harm associated with cannabis use or attitudes toward substance use more generally. Additionally, of those studies which have been conducted exploring healthcare professionals' personal cannabis use, beliefs about the risks of cannabis use, and attitudes toward substance use generally, none have used analogue methodology; rather, the majority of studies on this topic have either (a) asked healthcare professionals about their opinions on the legalization of medical and/or recreational cannabis, or (b) relied on participants' self-reported practices in order to gauge how their behaviors and/or beliefs had impacted their professional judgment. Such methodology may be prone to error (e.g., participants' incorrectly estimating how many referrals for substance abuse treatment they have made over a specific period of time) or fail to effectively operationalize clinical judgment, because respondents may support the legalization or decriminalization of cannabis despite viewing cannabis use as a high-risk behavior, as noted by Galston and Dionne Jr. (2013). Accordingly, the current study sought to resolve these gaps in the literature and methodological

flaws by studying doctoral psychology trainees and by utilizing analogue methodology.

### **Definition of Terms**

*Attitudes toward substance use* are defined as favorable or unfavorable evaluations of substance use. For the purposes of the current study, attitudes toward substance use were defined by scores on three subscales of the Substance Abuse Attitude Survey (SAAS; Chappel, Veach, & Krug, 1985): the Permissiveness (P-SAAS), Non-Moralism (NM-SAAS), and Non-Stereotyping (NS-SAAS) subscales. (Each of these constructs – permissiveness, non-moralism, and non-stereotyping – will be described individually below).

*Cannabis use disorder* is defined as “a problematic pattern of cannabis use leading to clinically significant impairment or distress... occurring within a 12-month period,” (American Psychiatric Association, 2013, p. 509). For the purposes of the study, cannabis use disorder was defined by *DSM-5* (American Psychiatric Association, 2013) criteria for this disorder.

*Current cannabis use* is defined as any use of cannabis in the past year (Bashford, Flett, & Copeland, 2010). For the purposes of the current study, current cannabis use was operationally defined as participant self-reported past-year cannabis use.

*History of cannabis use* is defined as lifetime incidence of cannabis use. For the purposes of the study, history of cannabis use was operationally defined as participant endorsement of lifetime cannabis use.

*Non-moralism* is defined as an attitude toward substance use which avoids perceptions of substance use as morally evil or wrong. For the purposes of the current study, non-moralism was operationally defined as scores on the NM-SAAS (Chappel et al., 1985).

*Non-stereotyping* is defined as attitudes suggestive of “non-reliance on popular societal stereotypes of substance use and substance users,” (Linden, 2010, p. 380). For the purposes of



the current study, non-stereotyping was operationally defined as scores on the NS-SAAS (Chappel et al., 1985).

*Perception of cannabis' risks* is defined as a set of beliefs congruent with the opinion that use of cannabis is physically or psychologically harmful, that there are no/few benefits to cannabis use, and that cannabis is addictive. For the purposes of the study, perception of cannabis' risks was defined as scores on the Perceptions of Cannabis Use Risks Questionnaire (PCURQ), an experimental questionnaire adapted from the work of Kondrad and Reid (2013).

*Permissiveness* is defined as attitudes indicating “[acceptance of] substance use within a continuum of normal human behavior,” (Linden, 2010, p. 380). For the purposes of the current study, permissiveness was operationally defined as scores on the P-SAAS (Chappel et al., 1985).

*Problem cannabis use* is defined as risk of developing cannabis use disorder or currently meeting criteria for cannabis use disorder. For the purposes of the current study, problem cannabis use was operationally defined as scores on the Cannabis Use Problems Identification Test (CUPIT; Bashford et al., 2010).

### **Research Questions**

- 1) Does doctoral psychology trainees' personal cannabis use predict trainees' perceptions of cannabis' risks?
- 2) Does doctoral psychology trainees' personal cannabis use predict trainees' attitudes toward substance use?
- 3) Are perceptions of cannabis' risks associated with attitudes toward substance use?
- 4) Do personal cannabis use, perceptions of cannabis' risks, and attitudes toward substance use predict doctoral psychology trainees' ability to identify cannabis use disorder from a clinical vignette?

### Statement of Hypotheses

- 1) Doctoral psychology trainees who reported current or past use of cannabis would have more positive attitudes regarding the benefits and risks of cannabis use. Specifically, doctoral psychology trainees who reported current or past use of cannabis would report (1a) lower perceptions of cannabis' risks as compared to individuals who denied cannabis use. (1b) Doctoral psychology trainees' perceptions of cannabis' risks would be lower among those who endorsed current cannabis use. Additionally, (1c) perceptions of cannabis' risks would decrease as trainees' own risk of problem cannabis use increased.
- 2) Doctoral psychology trainees who reported current or past use of cannabis would (2a) endorse more permissive attitudes toward substance use than trainees who denied cannabis use. Additionally, (2b) doctoral psychology trainees who reported current or past use of cannabis would endorse more non-moralistic attitudes toward substance use than trainees who denied cannabis use. Doctoral psychology trainees who reported current or past use of cannabis would also (2c) endorse more non-stereotyped attitudes toward substance use. (2d) Non-moralistic, (2e) permissive, and (2f) non-stereotyped attitudes toward substance use would be higher among those who currently used cannabis than those with a history of prior use. Additionally, trainees' risk of problem cannabis use would predict (2g) non-moralistic, (2h) permissive, and (2i) non-stereotyped attitudes toward substance use.
- 3) Doctoral psychology trainees' perceptions of cannabis' risks would be negatively correlated with (3a) trainee permissiveness (3b) trainee non-moralism, and (3c) trainee non-stereotyping toward substance use.
- 4) Trainees' cannabis use, risk of cannabis use problems, perceptions of cannabis' risks, and attitudes toward substance use would predict trainees' ability to identify cannabis use

disorder from a clinical vignette.

### **Delimitations**

The current study utilized a quantitative, quasi-experimental, survey design with analogue methodology. Because this study utilized a quasi-experimental design, participants could not be randomly assigned to conditions, which may impact the internal validity of the study; however, this was unavoidable, as it would have been unethical to assign participants to conditions in which substance use was required. As a result, no causal conclusions can be made based on the results of the study. Additionally, the current study relied on convenience sampling, which may limit the generalizability of study findings. It is possible that participants who chose to take part in the study self-selected into the study due to their interest in the description of the research, and that those who did not select to participate may have differed in certain ways from those who participated, in a manner which poses a threat to the ecological validity of the results.

Further, self-report data was used to measure participants' history of and current cannabis use. Accordingly, it is possible that participants may have been influenced by social desirability bias, and may have underreported cannabis use. Although research has indicated that adults generally report their cannabis use honestly (Darke, 1998), prior studies of healthcare professionals have indicated that this group may underreport cannabis use due to potential professional and legal repercussions (Norberg et al., 2012). In an effort to minimize this threat to study validity, all participant data was collected anonymously.

There is some question regarding the validity of measurements utilized in the current study to measure perceptions of cannabis' risks and attitudes toward substance use. There are no previously validated assessments of perceptions of cannabis use risks; accordingly, the study used a self-report measure adapted from prior research (Kondrad & Reid, 2013). Additionally,

there is limited data on the psychometric properties of the SAAS (Chappel et al., 1985), which was used to assess participants' attitudes toward substance use. Despite this, the SAAS is widely used to assess attitudes toward substance use and abuse and no comparable instruments exist to measure attitudes toward substance use. Accordingly, the SAAS was selected for the present study.

Finally, it is important to acknowledge that although the present study sought to identify the impact of trainees' attitudes on diagnostic decision-making, a third variable – participants' competence in diagnosis – may confound this relationship. Efforts were made to control for variables which were hypothesized to be associated with trainees' level of clinical competence, e.g. data on the number of years of training trainees had completed, as well as whether or not trainees were currently completing or had completed internship; however, it is possible that level of experience does not entirely account for trainee competence. Consideration was also given to other methods of controlling for clinical competence, i.e. providing *DSM-5* (American Psychiatric Association, 2013) diagnostic criteria to study participants as they reviewed the clinical vignette; however, it was ultimately decided that doing so would sacrifice the ecological validity of the study's analogue methodology. Although it is beyond of the scope of the present study, further research exploring the extent to which competence in diagnosis may limit the impact of trainees' personal biases is a fruitful area for further research and a recommended direction of study.

## CHAPTER II

### Literature Review

It is estimated that approximately nine percent of individuals who try cannabis will eventually develop dependence (Anthony, 2006; Anthony, Warner, & Kessler, 1994); this number increases to 17 percent among individuals who first use cannabis during adolescence (Anthony, 2006), and between 33 and 50 percent among daily users (Hall & Pacula, 2003). Lifetime prevalence of cannabis dependence is four percent in the United States (Anthony et al., 1994). Of the 7.3 million people ages 12 and older who met criteria for substance abuse or dependence in 2012, 4.3 million (approximately 1.7 percent of the total population ages 12 and older) met criteria for cannabis use disorder (SAMHSA, 2013b). As cannabis becomes more accessible, both by way of medical and recreational legalization, it is anticipated that the percentage of Americans who meet criteria for and require treatment of cannabis use disorder will continue to rise (Cerdá et al., 2012; Pacula et al., 2013).

Given the prevalence of cannabis use disorder in the United States, and the projected increase in cannabis use disorder linked to cannabis legalization efforts, it is important that healthcare professionals and trainees in healthcare related fields, including clinical and counseling psychology, be able to identify cannabis use disorder in their patients, in order to ensure prompt and appropriate treatment. Doctoral psychology trainees in particular frequently complete practicum, internship, and post-doctoral training in settings such as college counseling centers, hospitals, community mental health centers, and outpatient clinics, in which they are likely to encounter individuals with substance use issues, including cannabis use disorder; accordingly, it is imperative that psychology trainees are knowledgeable about cannabis use disorder and able to accurately identify cannabis use disorder among clients.

Despite this imperative, there are many barriers which may impede this process. Doctoral psychology trainees historically have minimal training in substance abuse treatment, which may result in substance use disorders going unidentified and untreated (Aanavi et al., 1999; Chiert et al., 1994; da Silva Cardoso et al., 2006; Lubin et al., 1986; Madson et al., 2008; Selin & Svanum, 1981). According to a recent survey of master's and doctoral students in clinical and counseling psychology conducted by Madson and colleagues (2008), only 34 percent of participants reported that they had completed a dedicated course in substance abuse treatment, and only 52 percent reported that they had received any form of substance abuse treatment training at all.

In lieu of formalized training on substance abuse diagnosis and treatment, what criteria might doctoral psychology trainees – and in turn, psychologists – use in their identification of substance use disorders? Prevailing evidence from the social psychology literature suggests that individuals' attitudes are likely to predict behavior when they are formed through personal experience (Cooke & Sheeran, 2004; Glasman & Albarracín, 2006; Kraus, 1995). Accordingly, if we are to understand doctoral psychology trainees' ability to identify cannabis use disorder, it is essential that we examine their personal cannabis use, as well as their perceptions about the risks of cannabis use and attitudes about substance use in general, which may be shaped by their personal use of cannabis.

The present study rested upon several discrete but related bodies of research. Although there is little literature which speaks specifically to the variables and population of interest in this study – doctoral psychology trainees, personal recreational cannabis use, and attitudes toward recreational cannabis use and substance use generally – previous research has explored other non-psychologist healthcare professionals' positions on medical and recreational cannabis use. Extant literature on healthcare professionals which identified factors that influence clinical

judgment and professional practices informed the selection of variables explored in the present study. Festinger's (1957) Theory of Cognitive Dissonance – which I posited may explain how healthcare professionals' personal behaviors bias their attitudes and subsequently, their professional judgment – served as the theoretical framework for the study.

As noted above, it is important to note that there is little literature which speaks specifically to the variables and population of interest in this study. To the knowledge of the author, no studies have explored doctoral psychology trainees' personal substance use and the impact of personal substance use on perceptions of cannabis' risks and attitudes toward substance use. Additionally, no research has explored licensed psychologists' attitudes toward or use of cannabis. Even among healthcare professionals more generally, the research in this area is sparse; only four studies (Linn et al., 1989; Charuvastra et al., 2005; Norberg et al., 2012; and Kondrad & Reid, 2013) have explored physicians' attitudes toward cannabis, of which only one – conducted 25 years ago (Linn et al. 1989) – explored attitudes toward recreational, as opposed to medical cannabis use. In lieu of research which directly addressed doctoral psychology trainees and cannabis use, research which addressed theoretically related groups, such as physicians and other groups of healthcare professionals, and health-related or substance use behaviors, such as alcohol use and cigarette smoking, was reviewed where research on cannabis use and/or psychology trainees specifically was unavailable.

As the current study sought to assess doctoral psychology trainees' ability to identify cannabis use problems, I begin by briefly discussing the diagnosis of interest, cannabis use disorder.

### **Cannabis Use Disorder**

According to the *DSM-5* (American Psychiatric Association, 2013), cannabis use disorder

is defined as “a problematic pattern of cannabis use leading to clinically significant impairment or distress... occurring within a 12-month period,” (p. 509). In order to meet criteria for cannabis use disorder, an individual must meet two of the following 11 criteria: (1) “Cannabis is often taken in larger amounts or over a longer period of time than was intended,” (American Psychiatric Association, 2013, p. 509); (2) “There is a persistent desire or unsuccessful efforts to cut down or control cannabis use;” (3) “A great deal of time is spent in activities necessary to obtain cannabis, use cannabis, or recover from its effects;” (4) “Craving, or a strong desire or urge to use cannabis;” (5) “Recurrent cannabis use resulting in a failure to fulfill major role obligations at work, school, or home;” (6) “Continued cannabis use despite having persistent or recurrent social or interpersonal problems, caused or exacerbated by the effects of cannabis;” (7) “Important social, occupational, or recreational activities are given up or reduced because of cannabis use;” (8) “Recurrent cannabis use in situations in which it is physically hazardous;” (9) “Cannabis use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by cannabis;” (10) Tolerance, defined by either “A need for markedly increased amounts of cannabis to achieve intoxication or desired effect,” or “Markedly diminished effect with continued use of the same amount of cannabis;” and (11) Withdrawal, as evidenced by symptoms of cannabis withdrawal syndrome, including but not limited to irritability, anxiety, difficulty sleeping, depressed mood, and/or somatic symptoms, or by the use of cannabis to relieve or prevent symptoms of withdrawal.

### **Identification of Cannabis Use Disorder**

Despite the American Psychiatric Association’s (2013) inclusion of cannabis use disorder in the *DSM-5*, there is no consensus on objective criteria which can be used to identify cannabis



use disorder (Alexander, 2003). Unlike other forms of problem substance use, such as binge drinking, which is defined by an objective standard (the number of drinks consumed within a specific period of time, with specific standards for men and women; National Institute of Alcohol Abuse and Alcoholism, 2004), no such criteria exist to identify cannabis use disorder. As Earlywine (2002) notes, research linking daily or near-daily use of cannabis to the negative outcomes generally used to identify cannabis use disorder (e.g., decreased social or occupational functioning, development of dependence, etc.) is inconsistent; on the other hand, Dennis, Babor, Roebuck, and Donaldson (2002) write that daily or near-daily cannabis use is not necessary in order for someone to meet criteria for dependence. In lieu of objective criteria which can help healthcare professionals' identify cannabis use disorder, such as the amount of cannabis consumed and the frequency of consumption, diagnoses of cannabis use disorder may rely on a more subjective standards for diagnosis: clinicians' judgment that clients' cannabis use is impacting their daily functioning. Such judgments may be influenced by mental health professionals' personal judgments about what patterns of behavior indicate problem cannabis use. This is especially the case if clients seeking mental healthcare are in denial about their problem cannabis use, or do not attribute their cannabis use to be the source of their presenting concerns, which is common among individuals with cannabis use problems (American Psychiatric Association, 2013).

### **Training in Identification of Substance Use Disorders**

In addition to the difficulties in diagnosing cannabis use disorder which may arise from a lack of objective criteria which define the disorder, individuals who are tasked with identifying cannabis use disorder – healthcare professionals – often have minimal training in the identification and treatment of substance use disorders. Clinical and counseling psychologists are

no exception to this. As has been previously noted, although doctoral psychology trainees frequently complete practicum and pre-doctoral internships in settings in which they are likely to encounter individuals with substance use issues, including cannabis use disorder, research has repeatedly demonstrated that doctoral psychology trainees in professional psychology fields, including clinical and counseling psychology, receive minimal to no formal training in substance use disorder treatment (Aanavi et al., 1999; Chiert et al., 1994; da Silva Cardoso et al., 2006; Lubin et al., 1986; Madson, et al., 2008; Selin & Svanum, 1981). This necessarily impairs psychologists' and trainees' ability to identify cannabis use disorder, and may make them more susceptible to relying on personal attitudes toward cannabis use and personal cannabis use as barometers of problem cannabis use.

### **Attitudes**

The concept of attitudes as a theoretical construct has been ascribed many definitions throughout the history of social psychology. Early writers in social psychology described attitudes as components of cognition which had not only cognitive, but affective, motivational, and behavioral components (Schwarz & Boehner, 2001). For example, in 1935, Gordon Allport defined attitudes as “a mental and neural state of readiness, organized through experience, exerting a directive and dynamic influence upon the individual's response to all objects and situations with which it is related,” (p. 810). Similarly, Krech and Crutchfield (1948) defined attitudes as “an enduring organization of motivational, emotional, perceptual, and cognitive processes with respect to some aspect of the individual's world,” (p. 152). Since this era, the definition of attitudes has shifted somewhat, such that the concept of attitudes now primarily refers to one's beliefs about, preferences for, and evaluations of a specific idea or entity; put most simply by Bem (1970), “Attitudes are likes and dislikes,” (p. 14). Similarly, Eagly and

Chaiken (1993) write that an attitude is “a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor,” (p. 1).

It is generally argued that individuals’ attitudes are predictive of their future behavior; so ubiquitous is this concept that, in a recent text, Hogg and Vaughan (2005) define attitudes as a “relatively enduring organization of beliefs, feelings, and behavioral tendencies towards socially significant objects, groups, events or symbols,” (p. 150). Although research has indicated that the relationship between personally held attitudes and behaviors is not as simple as initial theories have posited (Glasman & Albarracín, 2006), among those in the healthcare professions, there is a well-founded concern that personal attitudes will bias clinicians, resulting in inadequate or otherwise unethical patient care. Within the professional psychology literature, the need to be aware of one’s personal attitudes and the impact said beliefs may have on one’s professional judgment has been well documented. For example, the impact of personal beliefs on psychologists’ professional behavior is addressed by the American Psychological Association (2010) in its *Ethical Principles of Psychologists and Code of Conduct*, which states, “Psychologists [should] exercise reasonable judgment and take precautions to ensure that their potential biases ... do not lead to or condone unjust practices,” (p. 3).

### **Public Perceptions of Cannabis**

Although psychologists’ and doctoral psychology trainees’ attitudes toward cannabis use have not been documented, the contemporary attitudes of the general public in regards to cannabis are fairly well established. As noted previously, according to the Pew Research Center (2013), support for the legalization of cannabis has increased among “all demographic and political groups” (p. 4) in the United States, including men and women; individuals who identify as Caucasian, Black, and Hispanic; adults in every age bracket (18-29, 30-49, 50-64, and 65+);

individuals of all education levels; and among members across every major political group. Furthermore, it appears that the perceived risk of cannabis use is declining among Americans. According to Galston and Dionne Jr. (2013), recent surveys have indicated that a “slim majority” (p. 1) of Americans now believe that cannabis is less dangerous than alcohol. Additionally, although the percentage of Americans who believe that cannabis use can lead to abuse or dependence is unknown, anecdotal evidence suggests that many individuals believe that cannabis is not addictive (Szalavitz, 2010; Office of National Drug Control Policy, n.d.).

### **Attitudes Toward Cannabis and Substance Use Among Healthcare Professionals**

As cultural perceptions of cannabis’ risks shift, it is apt to consider how healthcare professionals, who will be tasked with identifying cannabis use disorder in patients, feel about cannabis and substance use generally, and whether these personal beliefs may be biasing their professional judgments, influencing their professional practices, and – as the current study has posited – compromising their ability to identify cannabis use disorder.

Research exploring healthcare professionals’ attitudes toward cannabis use is limited. To date, four studies (Charuvastra et al., 2005; Kondrad & Reid, 2013; Linn et al., 1989; Norberg et al., 2012) have explored in the impact of healthcare professionals’ personal attitudes toward cannabis on their professional practices. No research has explored psychologists’ attitudes toward cannabis, nor doctoral psychology trainees’.

Following the legalization of medical cannabis in Colorado, Kondrad and Reid (2013) conducted a survey of 520 family physicians practicing in Colorado in order to explore physicians’ attitudes about medical cannabis. In addition to polling respondents about their opinions on prescribing cannabis for medical ailments and whether or not they have prescribed cannabis to patients, Kondrad and Reid (2013) asked respondents about their attitudes regarding

the legalization of recreational cannabis, as well as their perceptions of cannabis' risks and benefits. Chi-square analyses revealed that physicians who had previously prescribed cannabis to one or more patients were more likely to endorse the statements, “Physicians should recommend marijuana as a medical therapy,” (p. 58) “There are significant physical health benefits to using marijuana,” “The FDA should reclassify marijuana so that it is no longer a schedule I drug,” and, most notably, “Marijuana should be legalized for recreational use,” than those family physicians who denied recommending cannabis to their patients. Although Kondrad and Reid's (2013) use of chi-square analyses, as opposed to regression analyses, limits the interpretation of their results, their findings suggest, at minimum, that physicians who recommend medical cannabis to their patients are more likely to hold positive attitudes about cannabis than those who choose not to prescribe the drug. Regrettably, although Kondrad and Reid (2013) asked respondents whether they supported the legalization of cannabis for recreational use, the authors did not conduct any analyses identifying how the attitudes of respondents who supported the legalization of recreational cannabis differed from those who did not.

A second study, by Charuvastra and colleagues (2005), supports the results of Kondrad and Reid (2013) and benefits from somewhat more rigorous statistical analysis and nationwide sampling, improving the generalizability of results. A sample of 960 physicians from a range of specialties, including family medicine, general medicine, obstetrics-gynecology, general psychiatry, and addiction medicine/addiction psychiatry, were recruited through the American Medical Association's national registry, as part of a larger study. Respondents were asked to complete the Permissiveness and Non-Moralism subscales from the SAAS (Chappel et al., 1985), a Likert-style self-report questionnaire. Additionally, participants were asked to respond to the statement, “Doctors should be able to legally prescribe marijuana as medical therapy,”

(Charuvastra et al., 2005, p. 89). Results of a forward step-wise logistic regression revealed that physician permissiveness and non-moralism, as measured by the SAAS, were predictive of physicians' opinions on the legalization of medical cannabis; those physicians who were more permissive of substance use and less moralistic in their attitudes toward substance use were more likely to support the legalization of medical cannabis. As Charuvastra et al. (2005) conclude, "In light of the uncertainty and controversy regarding the medical benefits and harms of marijuana prescription, it is not surprising that personal attitudes regarding substance use might influence physicians' views," (p. 91). Unfortunately, although Charuvastra et al. (2005) utilized regression, their decision to employ stepwise regression significantly compromises their results; as Field (2013) writes, stepwise regression "[relies] on the computer selecting variables based upon mathematical criteria... [taking] many important methodological decisions out of the hands of the researcher," (p. 323), and should not be used under virtually any circumstance because the mathematical models may fail to include certain variables in a regression model which may be supported by the theoretical model which informs the research.

Additionally, in a widely cited study, and the first known to explore physicians' personal cannabis use, Linn et al. (1989) surveyed 303 physicians from various medical specialties about their personal cannabis use and opinions on the legalization of cannabis. Using one way analyses of variance (ANOVAs) and chi-square tests, the authors – to their surprise – found that physicians' positions on the legalization of cannabis were unrelated to physicians' specialties, experience diagnosing substance use disorders or providing substance abuse treatment, or beliefs about the efficacy of substance abuse treatment. Instead, physicians' personal characteristics predicted their attitudes toward the legalization of cannabis. Physicians who were less concerned with the epidemic of drug use in the United States, and who were younger, less religious, and

politically liberal, were significantly more likely to favor more lenient cannabis policies (legalization or decriminalization versus criminalization) than older, more devout, and more politically conservative physicians. As with the work of Kondrad and Reid (2013), Linn et al.'s (1989) use of chi-square analyses limits the interpretability of these findings; it may be possible, for example, that older physicians were also more likely to be more religious and more politically conservative, and that one of these demographic variables, as opposed to all three, accounts for the between-group differences observed. Nonetheless, the findings of Linn et al. (1989) suggest that physicians' personal opinions, as opposed to their medical experience, are influencing their attitudes toward cannabis.

To date, only one known study (Norberg et al., 2012) has evaluated the impact of healthcare professionals' attitudes toward cannabis use on their provision of screenings and referral to substance abuse treatment for cannabis users. Utilizing a sample of 664 primary care physicians and nurses, the study asked participants about their attitudes toward cannabis use and the legalization of medical cannabis. Utilizing logistic regression, Norberg and colleagues (2012) found that nurses and physicians who believed that cannabis should not be available for medical use were 2.06 times more likely to report that they had screened someone for cannabis use in the past month than study participants who supported the legalization of medical cannabis, suggesting that healthcare professionals' personal beliefs about cannabis impact their provision of services to patients. It must be noted, however, that the use of self-reported service provision as an outcome variable compromises the validity of the study, as it is likely that healthcare professionals' estimates of their past-month service provision are inaccurate, and potentially biased by their attitudes toward provision of services to cannabis users, such that individuals who do not approve of cannabis use would be more likely to overestimate their provision of cannabis-

related screening and intervention services.

Of note, two of the aforementioned studies which have explored the impact of healthcare professionals' personal attitudes toward cannabis use have looked at physicians' attitudes toward the (medical or recreational) legalization of cannabis as an outcome variable (Linn et al., 1989; Charuvastra et al., 2005). Needless to say, physicians' attitudes toward the legalization of cannabis may have little to do with their clinical judgment or professional practices; as Galston and Dionne Jr. (2013) note, public opinion about the legalization of cannabis is often related to many other considerations beyond individuals' perceptions of cannabis' risks. Nonetheless, as Linn and colleagues (1989) note, physicians are considered to be authorities on matters relating to individuals' health, including substance use, and as such, their opinions on whether or not cannabis should be legalized are a form of professional practice, as are the opinions of mental health professionals. Given that healthcare professionals' attitudes toward the legalization of cannabis, as well as their willingness to prescribe cannabis, are related to their personal beliefs about cannabis, healthcare professionals' personal attitudes and the impact of these attitudes are ripe for further exploration, especially at a time of widespread changing cultural attitudes toward cannabis legalization and use among the general public.

### **Behavior**

The question at the core of the present study was, "Do doctoral psychology trainees' attitudes toward cannabis impact their clinical judgment in identifying cannabis use disorder?" Put more simply, this question, at its essence, embodies one of the core inquiries of social psychology: Do attitudes impact behavior? As I have already demonstrated, prior research suggests that healthcare professionals' attitudes toward the legalization of cannabis and the prescription of cannabis are closely related to their personal attitudes. What remains to be seen is



what shapes healthcare professionals' perceptions of the risks of cannabis use.

One factor which appears to influence individuals' beliefs about cannabis, and their support for the legalization of cannabis, is their personal cannabis use. According to the Pew Research Center (2013), 70 percent of individuals who have used cannabis support its legalization for recreational use, yet strikingly, among those who have never used cannabis, this percentage is halved, with only 35 percent supporting the legalization of cannabis. Such a noticeable difference may indicate a role for the theory of cognitive dissonance in explaining individuals' attitudes toward cannabis, such that individuals who use cannabis will develop more positive views toward cannabis in order to reduce the psychological discomfort they would otherwise experience from using a potentially harmful and addictive substance.

### **Festinger's (1957) Theory of Cognitive Dissonance**

In the introduction to his book, *A Theory of Cognitive Dissonance*, Festinger (1957) writes,

It has frequently been implied... that the individual strives toward consistency within himself. His opinions and attitudes, for example, tend to exist in clusters that are internally consistent... There is the same kind of consistency between what a person knows or believes and what he does. (p. 1-2)

As this passage indicates, the theory of cognitive dissonance, which Festinger goes on to describe in his text, is based on the premise that individuals seek consistency (a) between their various attitudes and beliefs and (b) between their attitudes and behavior.

Despite the fact that individuals may prefer consistency between their attitudes and between attitudes and behavior, individuals may not always act in ways which are consistent with their attitudes. For example, as Festinger (1957) describes, many individuals smoke

cigarettes despite knowing that smoking is bad for one's health. This inconsistency between individuals' beliefs – that smoking is a health hazard – and their behavior – continuing to smoke – is known as cognitive dissonance.

In addition to defining cognitive dissonance, Festinger (1957) makes a second crucial assertion in his initial description of cognitive dissonance: cognitive dissonance creates psychological discomfort. As such, cognitive dissonance acts as a negative feedback loop, compelling the individual to resolve the dissonance, thereby reducing the psychological discomfort that the inconsistency between opposing cognitions or opposing cognitions and behavior creates.

When individuals become aware that they have acted in a manner which is inconsistent with their beliefs, or that they hold two or more logically inconsistent beliefs, what can they do to reduce this discomfort? As Festinger (1957) theorizes, there are two ways to resolve cognitive dissonance: (1) the individual may change their future behavior such that it coincides with their beliefs, or (2) the individual may, as Festinger puts it, “change [their] ‘knowledge’” (p. 6); in other words, the individual may convince him/herself that they believe something which aligns with their behavior, or they may intentionally seek out information which confirms an attitude which supports their behavior.

### **Cognitive Dissonance and Substance Use**

When individuals who use substances experience cognitive dissonance associated with their substance use, research has demonstrated that they have a tendency to alter their attitudes – rather than their behaviors – to resolve the dissonance. For example, studies of cognitive dissonance among individuals who smoke have repeatedly found that cigarette smokers have a tendency to underestimate the health-related risks associated with smoking; this attitude reduces

the psychological discomfort which would otherwise arise from the inconsistency between smokers' behavior (smoking cigarettes) and their knowledge that smoking has been associated with adverse health outcomes, including lung cancer, respiratory illnesses, and death (Halpern, 1994; McMaster & Lee, 1991; Tagliacozzo, 1979).

In addition to studies exploring cognitive dissonance among smokers, literature has indicated that cognitive dissonance may play a critical role in maintaining cannabis use among those who use this drug. According to Peretti-Watel (2006), in societies in which cannabis use is viewed by the dominant culture as a social ill and/or risky behavior, as has historically been the case in the United States, individuals who use cannabis must “neutralise’ the social and legal stigma attached to their practice by convincing themselves that such stigma reflects the opinion of people who don’t know anything about the matter,” (p. 1035). In order to rationalize their behavior, Peretti-Watel (2006) argues, individuals who use marijuana

scapegoat “hard drug” users and establish a systematic differentiation between so-called “hard” and “soft” drugs. Cannabis users also emphasise their ability to control their consumption personally. Lastly, they tend to consider that cannabis use is not unhealthier than drinking alcohol or cigarette smoking... Cannabis users... reject the stigmatized stereotype of the drug addict, they consider their consumption a recreational and convivial activity, and their belonging to a peer group confirms this opinion. (p. 1035)

A quantitative study of French adolescents conducted by Peretti-Watel (2006) supports the notion that cannabis users have a tendency to alter their attitudes, rather than their behavior, in order to rationalize their cannabis use and reduce the psychological discomfort associated with cognitive dissonance. According to Peretti-Watel (2006), adolescents’ tendency to deny the riskiness of marijuana use was strengthened by their own use and by peer use. Additionally,

Peretti-Watel (2006) found that French adolescents' tendency to deny risk was positively correlated with academic achievement, but was not at all correlated with exposure to drug education provided at school, suggesting, as Peretti-Watel (2006) concludes, that these attitudes should be viewed as "a learned skill, not a lack of knowledge," (p. 1045).

### **Cognitive Dissonance and the Healthcare Professional**

Healthcare professionals are not immune to cognitive dissonance; indeed, research on healthcare professionals, including physicians and nurses, has consistently indicated that healthcare professionals' own health-related behavior influences their provision of services to patients. For example, compared to healthcare professionals who do not smoke cigarettes, a number of studies have demonstrated that primary care physicians and nurses who smoke are less likely to ask patients about smoking habits, to recommend that patients quit smoking, to provide evidence-based smoking cessation interventions to patients, and to have high self-efficacy when it comes to providing smoking cessation interventions (Aboyans, Pinet, Lacroix, & Laskar, 2009; Barengo, Sandstrom, Jormanainen, & Myllykangas, 2005; Behbehani, Hamadeh, & Macklai, 2004; Brotons et al., 2005; Gunes, Karaoglu, Genc, Pehlivan, & Egri, 2005; Hall, Vogt, & Marteau, 2005; Heath, Andrews, Kelley, & Sorrell; 2004; Kawahara et al., 2000; McKenna et al., 2001; Parna et al., 2005; Pipe, Sorensen, & Reid, 2009; Pizzo, Chellini, Grazzini, Cardone, & Badellino, 2003; Squier, Hesli, Lowe, Ponamorenko, & Medvedovskaya, 2006; Yan et al., 2008); these findings are consistent cross-nationally, and have been replicated in multiple countries across Asia, Europe, and North America. Similarly, a meta-analysis of 14 American and Chinese studies conducted by Zhu, Norman, & While (2011) concluded that overweight and obese healthcare professionals were less confident in their ability to provide weight management education and intervention for overweight or obese patients, perceived more

barriers to providing weight management interventions, and had more negative outcome expectations of weight management interventions than their normal-weight colleagues. Additionally, healthcare professionals' own fitness behavior has been found to predict their tendency to provide counseling on physical fitness to their patients (Abramson, Stein, Schaufele, Frates, & Rogan, 2000; Al-Dogheter, Al-Tuwijri, & Khan, 2007; Frank, Bhat Schelbert, & Elon, 2003; Rogers et al., 2006). These findings have also been replicated among medical students (Frank, Carrera, Elon, & Hertzberg, 2007). As Lobelo, Duperly, and Frank (2009), in a review of physician fitness practices, conclude, the association between healthcare professionals' personal healthcare practices and their professional behavior "is strong and independent of many demographic, training, and clinical practice factors... [This] relationship is already present at the beginning of medical training, [and] is evident in students from both developed and developing nations," (p. 91). In sum, healthcare professionals who "practice what they preach," as the saying goes, provide more effective health-related interventions, while those who do not follow basic preventive health guidelines in their personal lives demonstrate a bias which has significant implications for professional practice.

In addition to research which has explored healthcare professionals' weight management, physical fitness, and cigarette smoking, multiple studies have explored the impact of healthcare professionals' alcohol consumption on their professional practices, including assessment of alcohol abuse and provision of alcohol-related preventive healthcare interventions. Research on healthcare professionals' attitudes toward alcohol use, and the impact of these attitudes on professional behavior, may provide much insight into how healthcare professionals' beliefs about cannabis use may impact their related clinical practice. Whereas recent public health campaigns and contemporary medical science have emphasized the risks associated with smoking tobacco,

poor diet and obesity, and poor physical fitness, the matter of alcohol use is unique in that both the public and healthcare professionals believe that alcohol, when used by adults in moderation, carries minimal risk and may have some health benefits; in this sense, attitudes toward alcohol consumption more closely resemble current beliefs about recreational cannabis use. Additionally, whereas a comparatively small percentage of healthcare professionals in the United States smoke cigarettes (Frank et al., 1998; Pipe et al., 2009), many more healthcare professionals drink alcohol, in part due to its widespread social acceptance. Further, in lieu of training on the diagnostic criteria for alcohol use disorders and national guidelines defining binge drinking, healthcare professionals may rely on personal standards for identifying alcohol misuse in patients, which, if healthcare professionals are misusing or abusing alcohol themselves, may result in a failure to accurately diagnose and provide much needed intervention to patients abusing alcohol, even if the professionals' alcohol misuse itself has not resulted in professional impairment (Frost-Pineda, VanSusteren, & Gold, 2004; Johnson, Booth, & Johnson, 2005). This may also be the case for cannabis, which for many years was not considered to be an addictive substance, even within the medical community, a belief that has been perpetuated among those who support legalization of recreational cannabis in recent years (Szalavitz, 2010).

Multiple studies have supported the notion that healthcare professionals' personal alcohol use influences their professional practices. In one such study of 3,193 Finnish primary care physicians (Aalto & Seppa, 2007), respondents were asked to complete the Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, de la Fuente, & Grant, 1993), a popular Likert-style self-report measure typically used to screen for problem alcohol use, and to answer the question, "How many drinks should a male/female patient drink in a week to make you advise him/her to drink less?" (p. 1322). Results suggested that physicians whose

AUDIT scores indicated that they drank heavily reported higher mean thresholds at which they would intervene in patients' alcohol consumption by advising that consumption be reduced.

Similar findings were noted in a study of primary care doctors in Sweden (Geirsson, Hensing, & Spak, 2009), in which a short-form of the AUDIT, the AUDIT-C (Bush, Kihlavan, McConell, Fihn, & Bradley, 1998), was used.

In addition to quantitative evidence supporting the notion that healthcare professionals' own alcohol consumption may influence their perceptions of patients' alcohol misuse, one qualitative study, based on a sample of primary care nurses from England, sheds light on the notion that healthcare professionals' alcohol use may color their perceptions of their patients' alcohol use. Using a grounded theory approach, Lock, Kaner, Lamont, & Bond (2002) interviewed 24 primary care nurses about their "attitudes to alcohol intervention, including perceived barriers and facilitating factors, which influence their involvement in this area of work," (p. 334). As Lock et al. (2002) write, nurses may avoid engaging in discussions about alcohol use with patients because of their own attitudes toward drinking. As one nurse reported,

I'm fairly lax on what [the patients] drink because I enjoy wine, so from a personal point of view I wouldn't actually, unless somebody's needing alcohol every day, if someone's having a bottle at the weekend of wine and maybe one Gin and Tonic I wouldn't bat an eye lid at that quite honestly. (p. 339)

Another nurse reported

I know how I feel on a Friday night, I like my 5 brandies, I like to have 5 brandies or 5 gin and tonics on a Friday night because I've had enough of Monday to Friday and I need this thing that relaxes me and says this is the weekend now. (p. 339)

Perhaps most telling, however, is the statement of a third nurse interviewed by Lock et al. (2002)

when asked about her perceptions of her patients' alcohol intake: "Oh gosh, I drink much more than that!" (p. 339).

### **Healthcare Professionals' Cannabis Use**

Unlike healthcare professionals' use of legal substances (e.g., tobacco, alcohol), there is limited information on healthcare professionals' personal cannabis use and the influence of this behavior on healthcare professionals' professional opinions, clinical judgments, and behavior. Of the four studies which have explored the healthcare professionals' attitudes toward medical or recreational cannabis, or their professional behaviors related to patient cannabis use (Charuvastra et al., 2005; Kondrad & Reid, 2013; Linn et al., 1989; Norberg et al., 2012), only two studies (Kondrad & Reid, 2013; Linn et al., 1989) have investigated the influence of personal cannabis use on healthcare professionals' professional attitudes and practices (a third study, conducted by Norberg and colleagues (2012) attempted to investigate the role of personal cannabis use, but only one of the study's 664 participants admitted to using cannabis and no conclusions could be drawn). Despite this limited body of research, it is clear that personal cannabis use is related to healthcare professionals' opinions about cannabis as these opinions pertain both to the legalization of cannabis and to their clinical work.

In Linn et al.'s (1989) study of 303 physicians' attitudes toward the legalization of cannabis, 55% of those physicians surveyed reported having used cannabis at sometime in their lives, with nine percent reporting current use. Chi-square analyses revealed that individuals who had used cannabis at some point in their lives were significantly more likely to support more lenient penalties for cannabis possession than those who had never used cannabis.

In Kondrad and Reid's 2013 study of Colorado family physicians, the authors did not directly ask respondents whether they had ever used cannabis or currently used cannabis;



however, they did ask respondents whether personal cannabis use was a source of information which influenced their decision to recommend cannabis to patients. Of those surveyed, 20 participants reported that their cannabis use influenced their professional opinions about recommending cannabis. Compared to respondents who did not report that their personal cannabis use was an influence on their recommendation of cannabis to patients, those who reported that they used cannabis were significantly less likely to believe that cannabis is addictive and that cannabis poses serious mental health risks than those who did not report cannabis use. Additionally, physicians who reported cannabis use were significantly less likely to believe that doctors should be required to have ongoing relationships with patients to whom they prescribe cannabis than those who did not report cannabis use. Although the results of this analysis are not generalizable due to the small sample of physicians who endorsed cannabis use, Kondrad and Reid's (2013) findings suggest – definitively – that some healthcare professionals' personal cannabis use is an influence on their professional practices, and also that healthcare professionals' personal cannabis use appears to be associated with decreased perceptions of cannabis' risks and denial of cannabis use disorder, at least among some.

As the research reviewed demonstrates, healthcare professionals' personal health-related behaviors, including cannabis use, appear to bias their judgments of their patients' own practices in a manner which may pose a risk to patients whose problem health-related behaviors ultimately go unnoticed and untreated as a result. Although this bias has not previously been evaluated through the framework of cognitive dissonance (indeed, this may be methodologically impossible, as healthcare professionals' initiation of alcohol use and other health-related behaviors likely pre-date their careers), it is not unreasonable to conclude that healthcare professionals who use cannabis may, like the general public, "change [their] 'knowledge,'"

(Festinger, 1957, p. 6), to permit their cannabis use to continue, a cognitive tactic which in turn biases their professional judgment.

### **Summary and Conclusions**

This chapter has identified several important factors which serve as the framework for the proposed study. First, healthcare professionals' clinical judgments may be prone to bias. Research has demonstrated that healthcare professionals' personal attitudes toward substance use and their perceptions of risks associated with cannabis use influence their opinions on the legalization of recreational and medical cannabis, their decisions to recommend cannabis to their patients, and their provision of cannabis use disorder screening and intervention. Second, healthcare professionals' own health-related behaviors and personal substance use may bias their clinical judgment, which may result in a failure to make appropriate recommendations to patients at risk for adverse consequences secondary to their poor health-related behavior and/or problem substance use. Preliminary research has indicated that this bias may also impact healthcare professionals' judgments about the risk of harm associated with cannabis use and their tendency to recommend medical cannabis to patients. In this chapter, I have suggested that the attitudinal bias seen among healthcare professionals who engage in risky substance use, including cannabis use, may be a result of cognitive dissonance.

### **Limitations of Existing Studies**

While a substantial body of research has explored healthcare professionals' legal health-related and substance use behaviors, much less research has explored healthcare professionals' use of illicit substances and how their use of substances such as cannabis may impact their perceptions of the risks associated with cannabis use or their clinical judgment regarding patient cannabis use. This is understandable, given that cannabis is an illicit substance and healthcare

professionals may be hesitant to self-report illegal activity; however, given the changing cultural landscape around cannabis, which may result in increased cannabis consumption and subsequently, increased problem cannabis use, it is imperative that researchers assess the role that healthcare professionals' personal use of cannabis may play in their assessments of patients' cannabis use. If, as it has been posited, healthcare professionals who use cannabis subsequently view cannabis use less seriously, there is a significant risk that patients in need of substance abuse treatment will go unnoticed.

In addition, of those studies which have been conducted exploring healthcare professionals' personal cannabis use, beliefs about the risks of cannabis use, and attitudes toward substance use generally, none have used analogue methodology; rather, the majority of studies on this topic have either (a) asked healthcare professionals about their opinions on the legalization of medical and/or recreational cannabis, or (b) relied on participants' self-reported practices in order to gauge how their behaviors and/or beliefs had impacted their professional judgment. Such methodology may be prone to error (e.g., participants' incorrectly estimating how many referrals for substance abuse treatment they have made over a specific period of time) or fail to effectively operationalize clinical judgment, because respondents may support the legalization or decriminalization of cannabis despite viewing cannabis use as a high-risk behavior, as noted by Galston and Dionne Jr. (2013).

Finally, and most notably, to date, no studies have explored doctoral psychology trainees' personal use of cannabis, their perceptions of the risks associated with cannabis use, or their attitudes toward substance use more generally. The next generation of mental healthcare professionals, who will inevitably see increasing rates of cannabis use disorder, must be able to accurately identify problem cannabis use; accordingly, it is critical that research explore barriers

which may impede identification of cannabis use disorder.

### **The Current Study**

In order to address gaps in the extant literature, the current study explored the influence of doctoral psychology trainees' personal cannabis use, perceptions of cannabis' risks, and attitudes toward substance use on their ability to identify cannabis use disorder. In order to address the limitations of prior research on healthcare professionals' personal use of and attitudes toward cannabis, the study was conducted anonymously through a web-based survey platform in order to reduce participants' hesitance to self-report illicit substance use. Additionally, the study utilized analogue methodology to assess trainees' ability to identify cannabis use disorder, rather than self-reported service provision or attitudes toward legalization. The goal of the study was twofold: First, the study sought to identify whether doctoral psychology trainees' personal cannabis use predicted their perceptions of cannabis' risks and attitudes toward substance use generally. Second, the study sought to explore whether doctoral psychology trainees' personal cannabis use, perceptions of cannabis' risks, and non-moralistic, permissive, and non-stereotypical attitudes toward substance use predicted their ability to identify cannabis use disorder.

## CHAPTER III

### Methodology

The study used a quantitative, quasi-experimental survey design with analogue methodology. Using a vignette describing a client who met criteria for cannabis use disorder, the current study explored factors that influence doctoral psychology trainees' ability to identify cannabis use disorder in clients. In light of gaps in the extant literature on which factors may influence doctoral psychology trainees' clinical judgment, personal factors which have previously been implicated in clinical judgment among healthcare professionals were explored; these included (1) personal cannabis use, (2) non-moralistic, permissive, and non-stereotypical attitudes toward substance use, and (3) perceptions of cannabis' risks.

The study sought to answer the following questions:

- 1) Does doctoral psychology trainees' personal cannabis use predict trainees' perceptions of cannabis' risks?
- 2) Does doctoral psychology trainees' personal cannabis use predict trainees' attitudes toward substance use?
- 3) Are perceptions of cannabis' risks associated with attitudes toward substance use?
- 4) Do personal cannabis use history, perceptions of cannabis' risks, and attitudes toward substance use predict doctoral psychology trainees' ability to identify cannabis use disorder from a clinical vignette?

Based on these questions, the following hypotheses were examined:

- 1) Doctoral psychology trainees who reported current or past use of cannabis would have more positive attitudes regarding the benefits and risks of cannabis use.

Specifically, doctoral psychology trainees who reported current or past use of

- cannabis would report (1a) lower perceptions of cannabis' risks as compared to individuals who denied cannabis use. (1b) Doctoral psychology trainees' perceptions of cannabis' risks would be lower among those who endorsed current cannabis use. Additionally, (1c) perceptions of cannabis' risks would decrease as trainees' own risk of problem cannabis use increased.
- 2) Doctoral psychology trainees who reported current or past use of cannabis would (2a) endorse more permissive attitudes toward substance use than trainees who denied cannabis use. Additionally, (2b) doctoral psychology trainees who reported current or past use of cannabis would endorse more non-moralistic attitudes toward substance use than trainees who denied cannabis use. Doctoral psychology trainees who reported current or past use of cannabis would also (2c) endorse more non-stereotyped attitudes toward substance use. (2d) Non-moralistic, (2e) permissive, and (2f) non-stereotyped attitudes toward substance use would be higher among those who currently used cannabis than those with a history of prior use. Additionally, trainees' risk of problem cannabis use would predict (2g) non-moralistic, (2h) permissive, and (2i) non-stereotyped attitudes toward substance use.
- 3) Doctoral psychology trainees' perceptions of cannabis' risks would be negatively correlated with (3a) trainee permissiveness (3b) trainee non-moralism, and (3c) trainee non-stereotyping toward substance use.
- 4) Trainees' cannabis use, risk of cannabis use problems, perceptions of cannabis' risks, and attitudes toward substance use would predict trainees' ability to identify cannabis use disorder from a clinical vignette.

## Research Design

### Participants and Sample Characteristics

Participants in the current study were 141 doctoral psychology trainees. Participants were recruited in two ways. Although the author originally planned to distribute recruitment materials via multiple online mailing lists operated by the American Psychological Association, this was ultimately not feasible, as the Association prohibits doctoral trainees from soliciting research participants via its mailing lists. Instead, snowball sampling was employed. Letters of solicitation were sent to colleagues of the author who were also enrolled in doctoral programs or who were recent graduates, inviting them to participate in the study if they were eligible and/or pass information about the study along to any students they believed were eligible to participate (Appendix A). Additionally, letters of solicitation were distributed to doctoral program training directors asking them to forward information about the study to their students (Appendix B). In order to avoid inadvertent coercion, training directors were asked to have a department administrator, graduate assistant, or an equivalent staff member in a non-evaluative role forward recruitment materials to students. All recruitment materials clearly stated that the study was voluntary and anonymous. In return for their participation, all participants were given the option to enter a drawing for one of six \$50 Amazon.com virtual gift cards.

In order to ensure that study participants were doctoral psychology trainees in clinical or counseling psychology or related fields, participants were required to be currently enrolled in a Ph.D., Psy.D., or Ed.D. program in clinical psychology, counseling psychology, or other related professional psychology disciplines at the time of participation. Participants in non-applied psychology disciplines (e.g., those in experimental psychology doctoral programs) were not eligible to participate, as clinical work (e.g., assessment and treatment of mental disorders) is not

a core competency in these disciplines.

According to multiple simulation studies, in order to avoid an overfit model, studies utilizing logistic regression as the primary analysis, such as the proposed study, should include 10 cases per predictor variable for each dependent variable outcome (Agresti, 2007; Peduzzi, Concato, Kemper, Holford, & Feinstein, 1996; Stoltzfus, 2011). In the current study, the primary analysis (Question 4) included six predictor variables: (1) trainee history of cannabis use, (2) trainee risk of cannabis use problems, (3) trainee perceptions of cannabis' risks, (4) trainee permissiveness toward substance use, (5) trainee non-moralism toward substance use, and (6) trainee non-stereotyping toward substance use, and a dependent variable with two outcomes (yes/no to diagnosis of cannabis use disorder). Accordingly, the sample size necessary for the present study was estimated at 120 participants. An a priori power analysis performed using G\*Power (Version 3.1 for Mac; Faul, Erdfelder, Buchner, & Lang, 2009) produced a recommended sample size of 123, consistent with this estimate. Of the 141 participants who ultimately completed the survey, 18 responses were flagged for missing data; these participants were removed from further analysis (see Chapter IV for additional information about this decision), resulting in a sample size of  $N = 123$ .

Participants retained in the current study ranged in age from 22 to 40 years ( $M = 29.1$  years,  $SD = 4.1$ ). The majority of participants identified as female (77.2%) and White (Non-Latino) (74%). Participants represented a range of religious affiliations, and the majority (53.7%) reported that they identified as democrats. Participants' cannabis use history was approximately evenly split among the sample, with 43 participants (35%) reporting that they had never used cannabis, 36 (29%) endorsing past cannabis use, and 44 (36%) endorsing current (past year) recreational cannabis use. Table 3.1 presents the demographic characteristics of the overall



sample, as well as broken down by reported cannabis use history.

Table 3.1  
Means, Standard Deviations, Frequencies, and Percentages of Participant Demographics

Characteristic	Overall Sample ( <i>N</i> = 123)	Current Cannabis Users ( <i>n</i> = 44)	Past Cannabis Users ( <i>n</i> = 36)	Denied Cannabis Users ( <i>n</i> = 43)
Age ( $M_{\text{years}} \pm SD_{\text{years}}$ )	29.1 $\pm$ 4.1	29.0 $\pm$ 3.7	30.0 $\pm$ 4.1	28.5 $\pm$ 4.4
Sex (Frequency)				
Male	27 (22.0%)	14 (31.8%)	7 (19.4%)	6 (14.0%)
Female	95 (77.2%)	30 (68.2%)	28 (77.8%)	37 (86.0%)
Other	1 (0.8%)	0 (0.0%)	1 (2.8%)	0 (0.0%)
Race/Ethnicity (Frequency)				
African American, Caribbean American, or Black	5 (4.1%)	1 (2.3%)	2 (5.6%)	2 (4.7%)
Asian American	6 (4.9%)	1 (2.3%)	2 (5.6%)	3 (7.0%)
Latina/Latino	6 (4.9%)	3 (6.8%)	3 (8.3%)	0 (0.0%)
Native American	1 (0.8%)	1 (2.3%)	0 (0.0%)	0 (0.0%)
White (Non-Latino)	91 (74.0%)	32 (72.7%)	25 (69.4%)	34 (79.1%)
Biracial/Multiracial	8 (6.5%)	4 (9.1%)	3 (8.3%)	1 (2.3%)
International Student	4 (3.3%)	1 (2.3%)	0 (0.0%)	3 (7.0%)
Other	2 (1.6%)	1 (2.3%)	1 (2.8%)	0 (0.0%)
Religious Affiliation (Frequency)				
Buddhist	3 (2.4%)	1 (2.3%)	1 (2.8%)	1 (2.3%)
Catholic/Christian	42 (34.1%)	10 (22.7%)	11 (30.0%)	21 (48.8%)
Jewish	18 (14.6%)	9 (20.5%)	4 (11.1%)	5 (11.6%)
Native American	1 (0.8%)	1 (2.3%)	0 (0.0%)	0 (0.0%)
Pagan	1 (0.8%)	1 (2.3%)	0 (0.0%)	0 (0.0%)
Sikh	1 (0.8%)	1 (2.3%)	0 (0.0%)	0 (0.0%)
Spiritualist	4 (3.3%)	0 (0.0%)	2 (5.6%)	2 (4.7%)
Unitarian/Universalist	1 (0.8%)	0 (0.0%)	1 (2.8%)	0 (0.0%)
Atheist	15 (12.2%)	6 (13.6%)	3 (8.3%)	6 (14.0%)
Agnostic	13 (10.6%)	5 (11.4%)	4 (11.1%)	4 (9.3%)
Humanist	4 (3.3%)	0 (0.0%)	3 (8.3%)	1 (2.3%)
No religion	13 (10.6%)	7 (15.9%)	3 (8.3%)	3 (7.0%)
Multifaith	2 (1.6%)	1 (2.3%)	1 (2.8%)	0 (0.0%)
Other	5 (4.1%)	2 (4.5%)	3 (8.3%)	0 (0.0%)
Political Affiliation (Frequency)				
Democrat	66 (53.7%)	30 (68.2%)	15 (41.7%)	21 (48.8%)
Republican	9 (7.3%)	1 (2.3%)	3 (8.3%)	5 (11.6%)
Independent	26 (21.1%)	7 (15.9%)	8 (22.2%)	11 (25.6%)
Other	22 (17.9%)	6 (13.6%)	10 (27.8%)	6 (14.0%)

In regards to doctoral training, the majority of participants in the current study reported that they were enrolled in Ph.D. programs (83.7%). Nearly half of the sample reported that they hailed from counseling psychology programs (49.6%). Participants varied in the years of training they reported, with slightly more reporting that they were in their fourth year of training or beyond (58.5%); the majority reported that they had yet to start internship (79.7%). Table 3.2 presents the graduate training characteristics of the overall sample, as well as broken down by reported cannabis use history.

Table 3.2  
*Frequencies and Percentages of Sample Training Characteristics*

Characteristic	Overall Sample ( <i>N</i> = 123)	Current Cannabis Users ( <i>n</i> = 44)	Past Cannabis Users ( <i>n</i> = 36)	Denied Cannabis Users ( <i>n</i> = 43)
<b>Degree Type</b>				
Ph.D.	103 (83.7%)	34 (77.3%)	32 (88.9%)	37 (86.0%)
Psy.D.	20 (16.3%)	10 (22.7%)	4 (11.1%)	6 (14.0%)
<b>Discipline</b>				
Clinical Psychology	53 (43.1%)	25 (56.8%)	15 (41.7%)	13 (30.2%)
Counseling Psychology	61 (49.6%)	17 (38.6%)	19 (52.8%)	25 (58.1%)
School Psychology	4 (3.3%)	1 (2.3%)	0 (0.0%)	3 (7.0%)
Other	5 (4.1%)	1 (2.3%)	2 (5.6%)	2 (4.7%)
<b>Standing in Doctoral Program</b>				
1 <sup>st</sup> Year	20 (16.3%)	8 (18.2%)	2 (5.6%)	10 (23.3%)
2 <sup>nd</sup> Year	9 (7.3%)	1 (2.3%)	4 (11.1%)	4 (9.3%)
3 <sup>rd</sup> Year	22 (17.9%)	9 (20.5%)	7 (19.4%)	6 (14.0%)
4 <sup>th</sup> Year	34 (27.6%)	12 (27.3%)	8 (22.2%)	14 (32.6%)
5 <sup>th</sup> Year	21 (17.1%)	9 (20.5%)	6 (16.7%)	6 (14.0%)
6 <sup>th</sup> Year	15 (12.2%)	5 (11.4%)	7 (19.4%)	3 (7.0%)
7 <sup>th</sup> Year or Beyond	2 (1.6%)	0 (0.0%)	2 (5.6%)	0 (0.0%)
<b>Internship Status</b>				
Currently				
Completing/Completed	25 (20.3%)	7 (15.9%)	11 (30.6%)	7 (16.3%)
Not yet started	98 (79.7%)	37 (84.1%)	25 (69.4%)	36 (83.7%)

In addition to collecting general information on participants' doctoral training experiences, participants were also asked whether they had received specialized training in the diagnosis and treatment of substance use disorders. Contrary to previous literature which has indicated that doctoral psychology trainees receive minimal to no formal training in substance use disorder treatment (e.g., see Aanavi et al., 1999; Chiert et al., 1994; da Silva Cardoso et al., 2006; Lubin et al., 1986; Madson et al., 2008; Selin & Svanum, 1981), the majority of participants in the current study (78.9%) reported that they had received some training in substance use disorders over the course of graduate school. Table 3.3 presents the substance use disorder training characteristics of the overall sample, as well as broken down by reported cannabis use history.

Table 3.3

*Participants' Substance Use Disorder Training Characteristics as Frequencies and Percentages*

Substance Use Disorder Training	Overall Sample (N = 123)	Current Cannabis Users (n = 44)	Past Cannabis Users (n = 36)	Denied Cannabis Users (n = 43)
Endorsed	97 (78.9%)	38 (86.4%)	29 (80.6%)	30 (69.8%)
"I have taken a graduate-level course (or multiple courses) on addiction or substance use disorder treatment."	41 (33.3%)	20 (45.5%)	12 (33.3%)	9 (20.9%)
"I have attended a workshop or conference on addiction or substance use disorder treatment."	44 (35.8%)	19 (43.2%)	11 (30.6%)	14 (32.6%)
"I am currently completing, or have previously completed an externship, internship, or similar clinical training experience in which substance use disorders treatment was a primary focus."	42 (34.1%)	18 (40.9%)	13 (36.1%)	11 (25.6%)
"I have worked with clients with problem substance use or substance use disorder diagnoses."	83 (67.5%)	33 (75.0%)	25 (69.4%)	25 (58.1%)
"I have conducted research on substance use/addiction."	13 (10.6%)	8 (18.2%)	3 (8.3%)	2 (4.7%)
"I have completed training toward certification as a substance abuse counselor, or am certified as a substance abuse counselor."	8 (6.5%)	3 (6.8%)	2 (5.6%)	3 (7.0%)
Denied	26 (21.1%)	6 (13.6%)	7 (19.4%)	13 (30.2%)

Participants who identified as current cannabis users completed the Cannabis Use Problems Identification Test (CUPIT), a screening measure (Bashford et al., 2010; discussed further below). Of the 44 participants who endorsed current cannabis use, eight (18.2%) received scores of 12 or higher on this measure, considered a positive screen for problem cannabis use on the CUPIT; of these eight, two participants from this group received scores greater than 20, indicating that they met criteria for cannabis use disorder. Participants' responses to Item 1 of the CUPIT revealed that of the 44 participants who endorsed current cannabis use, 28 (63.6%) reported that they used cannabis less than once per month during the past year, five (11.4%) reported that they had used cannabis approximately once monthly during the past year, eight (18.2%) reported that they had used cannabis approximately 2-3 days/month over the past year, one (2.3%) reported that she had used cannabis weekly over the past year, and two (4.5%) reported that they had used cannabis at least 5-6 days/week over the past year. Given that only 44 participants endorsed current cannabis use, separating current users into subgroups based on the frequency of their use would have resulted in low sample sizes for each subgroup and threatened the effect size of subsequent analyses; accordingly, participants who identified as current users were maintained as a single group for subsequent analyses.

### **Procedures**

Prior to beginning study recruitment, approval from the author's dissertation committee and the Seton Hall University Institutional Review Board (IRB) was obtained.

Potential participants received letters of solicitation through the aforementioned avenues of recruitment. Letters included an overview of the study, as well as a description of requirements of participation, time commitment required to participate, and potential benefits and risks associated with participation. Data was collected anonymously in order to protect the

identity of individuals who endorsed cannabis use, which may have personal, professional, and legal repercussions. Recipients of recruitment materials were informed in the letter of solicitation that they would not be asked for any identifying information in the survey. Additionally, participants were informed that the survey would employ anonymization features, ensuring that IP addresses were not collected; this ensured that all data collected was anonymous and could not be traced to respondents. Prospective participants were informed that their personal information would be stored confidentially on a USB memory key, which would be kept in a locked drawer at a secure physical site. Finally, participants were advised that they could print the letter of solicitation for their personal records. Interested parties who had questions or concerns about the study were advised to contact the principal investigator or the Seton Hall University IRB with any questions. After reviewing the letter of solicitation, those who wished to complete the study were directed to Qualtrics, an online, secure server-based survey platform. Those who agreed to participate demonstrated consent by completing the survey.

After being directed to Qualtrics via a link in the letter of solicitation, participants were presented with a brief set of demographic questions (Appendix C). Additionally, participants were asked for basic information about their doctoral program (e.g., whether they were enrolled in a Ph.D., Psy.D., or Ed.D program; the specialty of their program – e.g., clinical psychology, counseling psychology, etc.; and how far they had progressed in their doctoral studies), in order to confirm that they met inclusionary criteria for the study. Of note, in an effort to protect participant anonymity, participants were not asked to identify their doctoral program or state of residence. Although the decision not to collect demographic data related to residence restricted the ability of the current study to assess differences in attitudes and diagnostic ability among students in states where medical and/or recreational cannabis use is legal versus illegal – an



interesting and timely vantage point from which to evaluate study data – given the possibility that collecting this information in addition to other identifying demographics may have posed a risk to participant anonymity, and the fact that such analyses were not central to the study’s purpose, this omission was deemed suitable.

After completing the demographic questions, participants were presented with a vignette about a college student named “John” (Appendix D). In the vignette, participants were told that John presented for a mandatory drug and alcohol use assessment at the college counseling center where they were an extern. In the vignette, John endorsed symptoms consistent with a diagnosis of cannabis use disorder of moderate severity as defined by the *DSM-5* (American Psychiatric Association, 2013). The vignette was constructed by the principal investigator, and reviewed by three licensed psychologists considered experts in the field of substance use disorders, as well as the author’s dissertation advisor and committee members, all psychologists themselves. Following the vignette, participants were asked to answer the question “Does John have cannabis use disorder?” (yes/no). Once participants completed this question and progressed to the next page of the survey, they were unable to return to the vignette, in order to prevent participants from altering their initial answers.

After reviewing the vignette and responding to the associated question, participants were asked to provide information about their personal cannabis use (Appendix E). Participants were first asked to identify whether they currently used or had previously used cannabis. Participants who reported current cannabis use (defined as use in the past 12 months) were asked to complete the CUPIT (Bashford et al., 2010; Appendix F). Those who did not endorse current cannabis use were directed to complete the PCURQ (adapted from Kondrad & Reid, 2013; Appendix G) and the SAAS (Chappel et al., 1985; Appendix H). Individuals who were asked to complete the

CUPIT completed these measures following their completion of the CUPIT. All measures are described further below.

After completing the PCURQ and SAAS, participants were asked a final demographic question regarding their histories of graduate training in the diagnosis and treatment of substance use disorders (Appendix I). Individuals who endorsed having received specialized training in substance use disorder assessment and/or treatment were prompted to identify what form(s) this training took (e.g., coursework, practicum or internship experiences, etc.) Participants were asked to select all types of training in which they had participated.

Following their completion of the survey, subjects were thanked for their participation and asked not to discuss the purpose of the study with other potential participants, in order to avoid biasing subsequent participants' responses.

At the end of the study, participants were again provided with contact information for Ms. Stratyner, as well as the Seton Hall University IRB should they have had any questions about the study. Additionally, participants were invited to click on a hyperlink which directed them to a separate survey where they were able to enter a raffle for one of six \$50 Amazon.com e-gift cards. Participation in the raffle was completely voluntary. In order to protect participant anonymity, participants were only required to enter their email addresses in order to enter the raffle, and could, if they so chose, use an email address that did not identify them. Furthermore, as email addresses were provided in a separate survey, it was impossible to associate participants' study data with their email addresses. Finally, utilization of Amazon.com e-gift cards as incentives maintained participant anonymity, as these gift cards can be delivered via email (rather than by mail) and recipients' names are not required to purchase/send gift cards. Participants who did not complete all study items did not forfeit these benefits, and were able to

proceed to the end of the study, click the link to the separate raffle survey, and enter the raffle. Mean survey response time was 37 minutes; however, when respondents who took more than 10 hours to complete the survey (suggesting that they may have unintentionally left the survey open in their internet browsers) were removed, mean response time was reduced to 18 minutes. The majority of participants (63.83%) completed the survey in 8-16 minutes.

### **Instruments**

**Cannabis Use Problems Identification Test.** The CUPIT (Bashford et al., 2010) is a 16-item self-report screening instrument that measures current and potential problem cannabis use. The CUPIT includes 2 subscales: Impaired Control (over cannabis use) and Problems (caused by cannabis use). As the titles of these subscales imply, Impaired Control measures individuals' consumption of and difficulty controlling their cannabis use (e.g., "On how many days have you used cannabis during the past 12 months?" and "Have you felt you needed cannabis?"), while the Problems subscale measures participants' experiences of detrimental consequences attributed to cannabis use (e.g., "Did your use of cannabis ever interfere with your work at school, job, or your home life?"). Despite the two-factor structure of the CUPIT, total scores are used to calculate problem cannabis use. Item scoring varies by item, with higher total scores indicating increased risk of problem cannabis use. The measure utilizes a cutoff score of 12 or above as an indication that individuals who complete the measure are at risk of developing cannabis use disorder; scores of 20 or above indicate that individuals meet criteria for cannabis use disorder (Bashford et al., 2010).

The CUPIT demonstrates strong internal consistency; in an initial validation study utilizing a sample of 74 adults, Chronbach's alphas were .92 for the Impaired Control subscale and .90 for the Problems subscale (Bashford et al., 2010). In the current study, Chronbach's

alphas were .88 for the Impaired Control subscale and .72 for the Problems subscale. One-week item test-retest reliability estimates are also strong, ranging from .89 to .99 in initial validation studies of the measure, indicating that respondents' scores on the CUPIT remain stable over time (Bashford et al, 2010).

Concurrent validity of CUPIT scores is demonstrated by moderate to strong correlations between CUPIT scores and number of *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV*; American Psychiatric Association, 1994) and *International Classification of Diseases, Tenth Edition (ICD-10*; World Health Organization, 1992) symptoms of cannabis use disorder endorsed, as well as with a previously validated measure of problem cannabis use, the Cannabis Problems Questionnaire (Bashford et al., 2010; Copeland, Gilmour, Gates, & Swift, 2005).

**Perceptions of Cannabis Use Risks Questionnaire.** To date, there are no standardized assessments which exist to assess individuals' perceptions of the risks of cannabis use; accordingly, in order to assess individuals' perceptions of the risk of harm from cannabis use, the present study utilized an adapted version of a questionnaire developed in a previous study of family physicians' attitudes toward medical cannabis (Kondrad & Reid, 2013). The original survey is a 17-item measure that assesses attitudes ranging from physicians' views on the legalization of recreational cannabis to their opinions on Colorado's medical cannabis policy. Items are answered using a 5-point Likert-style scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Items included on the survey were evaluated for construct validity by six family physicians and a psychologist; additionally, survey items were pilot-tested by 18 family physicians and a psychiatrist (Kondrad & Reid, 2013). Despite these procedures, to date, there are no published studies of validity or reliability for this measure.

For the purposes of the current study, a revised version of the questionnaire utilized by Kondrad and Reid (2013) was utilized in order to evaluate participants' perceptions of risk associated with cannabis use. In order to adapt Kondrad and Reid's (2013) measure for these purposes, items which inquired about physicians' roles in the prescription of cannabis and the medical utility of cannabis (e.g., "Training about medical marijuana should be incorporated into medical school curricula,") and items referring to Colorado's medical cannabis legislation (e.g., "Medical marijuana should be included in the Colorado Prescription Drug Monitoring Program (PDMP), which tracks prescribing and dispensing of controlled substances,") were removed. Additionally, as it has been suggested that individuals' attitudes toward the legalization of recreational and medical cannabis do not necessarily equate with individuals' perceptions of cannabis as a harmful substance (Galston, & Dionne Jr., 2013), items intended to assess individuals' attitudes toward Food and Drug Administration regulation or legalization of cannabis were removed. The subsequent questionnaire includes five items which assess individuals' perceptions of the physical and mental health risks of cannabis, physical and mental health benefits of cannabis, and the addictive properties of cannabis (Appendix G). Items on this questionnaire have high face validity. In order to calculate a total score for this questionnaire, reverse scoring was applied to items describing the benefits of cannabis use, and item scores were added to create a continuous total score variable. Higher scores on the Perceptions of Cannabis Use Risks Questionnaire (PCURQ) indicate greater perceived risk associated with cannabis use. In order to evaluate the reliability of the PCURQ, Chronbach's alpha was calculated. The resulting statistic,  $\alpha = .66$ , suggests that the PCURQ demonstrated acceptable reliability in the current sample.

**Substance Abuse Attitude Survey.** The SAAS (Chappel et al., 1985) is a 50-item self-

report measure of attitudes toward drug and alcohol misuse. The SAAS includes five subscales: (1) Permissiveness, (2) Treatment Intervention, (3) Non-Stereotyping, (4) Treatment Optimism, and (5) Non-Moralism. Items are answered using a 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), with higher scores indicating higher levels of agreement with the value indicated by each subscale.

Permissiveness measures attitudes toward substance use which imply that respondents view substance use as a component of normal human behavior (e.g., “Daily use of one marijuana cigarette is not necessarily harmful.”). Treatment Intervention measures respondents’ tendency to perceive substance misuse as a behavior which requires clinical attention (e.g., “Long-term outpatient treatment is necessary for the treatment of drug addiction.”). Non-Stereotyping measures respondents’ tendency to disagree with commonly held stereotypes of substance users (e.g., “Recreational drug use precedes drug misuse.”). Treatment Optimism measures respondents’ outlook on substance use disorder treatment (e.g., “An alcohol or drug dependent person who has relapsed several times probably cannot be treated.”). Finally, Non-Moralism measures respondents’ avoidance of perceptions of substance use as wrong or evil (e.g., “Alcoholism is associated with a weak will.”) It should be noted that hypotheses were only generated for three of the five SAAS subscales: Permissiveness (P-SAAS) and Non-Moralism (NM-SAAS), which have previously been associated with positive attitudes toward medical cannabis among physicians (Charuvastra et al., 2005), and Non-Stereotyping (NS-SAAS), which was hypothesized to be associated with personal cannabis use based on prior literature suggesting that individuals who use cannabis reject stereotypical notions of the drug addict (Peretti-Watel, 2006); however, in order to preserve instrument validity, the entire instrument was administered, and only the three subscales of interest were analyzed.

The subscales of the SAAS have previously demonstrated acceptable levels of internal consistency; data from the initial publication of the SAAS indicated that Chronbach's alphas for the P-SAAS, NM-SAAS, and NS-SAAS subscales were .77, .81, and .67, respectively (Chappel et al., 1985). Additionally, according to Chappel et al. (1985), the factor structure of the SAAS has shown "considerable stability" (p. 51) over the course of multiple factor analyses. In the current study, Chronbach's alphas for the P-SAAS, NM-SAAS, and NS-SAAS were .72, .60, and .64, respectively.

Unfortunately, data on the validity of the SAAS is limited; Chappel et al. (1985) do not report any validity data on the NM-SAAS, NS-SAAS, and P-SAAS subscales. Additionally, the SAAS, originally developed in 1985, has not been revised since its initial publication; accordingly, it is possible that some items on the SAAS may reflect outdated beliefs about substance use and misuse by contemporary cultural standards. Despite these limitations, the SAAS remains the definitive assessment of attitudes toward substance use, and continues to be utilized in studies assessing attitudes toward substance use. In the past 10 years, the SAAS has been cited in at least 56 studies, according to estimates produced by Google Scholar. Additionally, the SAAS has been used in two of the three studies of physician attitudes toward cannabis (Charuvastra et al., 2005; Linn et al., 1989).

## Chapter IV

### Results

The purpose of the current study was (a) to assess whether doctoral psychology trainees' personal cannabis use predicted their perceptions of the risks of cannabis use and attitudes toward substance use, and (b) to explore whether doctoral psychology trainees' personal cannabis use histories, perceptions of cannabis' risks, and attitudes toward substance use predicted whether they would correctly diagnose cannabis use disorder. Based on the hypotheses generated for the present study, the following statistical analyses were planned:

- 1a) Doctoral psychology trainees who reported current or past use of cannabis would report lower perceptions of cannabis' risks as compared to individuals who denied cannabis use. This hypothesis was to be tested using an independent samples t-test to compare two groups' (those who endorsed cannabis use history versus those who denied cannabis use history) scores on the PCURQ.
- 1b) Doctoral psychology trainees' perceptions of cannabis' risks would be lower among those who endorsed current cannabis use. This hypothesis was to be tested using an independent samples t-test to compare two groups' (current cannabis users and past cannabis users) scores on the PCURQ.
- 1c) Perception of cannabis' risks would decrease as trainees' own risk of problem cannabis use increased. This hypothesis was to be tested using linear regression analysis of the scores on the CUPIT and the PCURQ.
- 2a) Doctoral psychology trainees who reported current or past use of cannabis would endorse more permissive attitudes toward substance use than trainees who denied cannabis use. This hypothesis was to be tested using an independent samples t-test to



- compare two groups' (those who endorsed cannabis use history versus those who denied cannabis use history) scores on the P-SAAS.
- 2b) Doctoral psychology trainees who reported current or past use of cannabis would endorse more non-moralistic attitudes toward substance use than trainees who did not use cannabis. This hypothesis was to be tested using an independent samples t-test to compare two groups' (those who endorsed cannabis use history versus those who denied cannabis use history) scores on the NM-SAAS.
- 2c) Doctoral psychology trainees who reported current or past use of cannabis would endorse more non-stereotyped attitudes toward substance use than trainees who did not use cannabis. This hypothesis was to be tested using an independent samples t-test to compare two groups' (self-reported cannabis users and denied cannabis users) scores on the NS-SAAS.
- 2d) Non-moralistic attitudes toward substance use would be higher among those who endorsed current cannabis use than those with a history of prior use. This hypothesis was to be tested using an independent samples t-test to compare two groups' (current cannabis users and past cannabis users) scores on the NM-SAAS subscale.
- 2e) Permissive attitudes toward substance use would be higher among those who currently used cannabis than those with a history of prior use. This hypothesis was to be tested using an independent samples t-test to compare two groups' (current cannabis users and past cannabis users) scores on the P-SAAS subscale.
- 2f) Non-stereotyped attitudes toward substance use would be higher among those who currently used cannabis than those with a history of prior use. This hypothesis was to be tested using an independent samples t-test to compare two groups' (current

- cannabis users and past cannabis users) scores on the NS-SAAS.
- 2g) Trainees' risk of problem cannabis use would predict non-moralistic attitudes toward substance use. This hypothesis was to be tested using linear regression of scores on the CUPIT and the NM-SAAS.
- 2h) Trainees' risk of problem cannabis use would predict permissive attitudes toward substance use. This hypothesis was to be tested using linear regression of scores on the CUPIT and the P-SAAS.
- 2i) Trainees' risk of problem cannabis use would predict non-stereotyped attitudes toward substance use. This hypothesis was to be tested using linear regression of scores on the CUPIT and the NS-SAAS.
- 3a) Doctoral psychology trainees' perceptions of cannabis' risks would be negatively correlated with trainee permissiveness toward substance use. This hypothesis was to be tested using correlation between scores on the P-SAAS and the PCURQ.
- 3b) Doctoral psychology trainees' perceptions of cannabis' risks would be negatively correlated with trainee non-moralism toward substance use. This hypothesis was to be tested using correlation between scores on the NM-SAAS and the PCURQ.
- 3c) Doctoral psychology trainees' perceptions of cannabis' risks would be negatively correlated with trainee non-stereotyping toward substance use. This hypothesis was to be tested using correlation between scores on the NS-SAAS and the PCURQ.
- 4) Trainees' cannabis use, risk of cannabis use problems, perceptions of risk associated with cannabis use, and attitudes toward substance use would predict trainees' ability to identify cannabis use disorder from a clinical vignette. This hypothesis was to be tested using multiple hierarchical logistic regression. Demographic information was

to be entered in Step 1, endorsement of past cannabis use was to be entered in Step 2, endorsement of current cannabis use and risk of cannabis use problems were to be entered as Step 3, and perceptions of cannabis' use risks (scores on the PCURQ) and attitudes toward substance use (scores on the P-SAAS, NM-SAAS, and NS-SAAS) were to be entered in Step 4. The outcome measure was to be respondents' assessment of cannabis use disorder – a binary categorical variable – in the clinical vignette.

### **Data Screening and Preliminary Analyses**

Prior to initiating analyses to evaluate the proposed hypotheses, a series of data screening procedures were conducted. First, data was evaluated for accuracy of entry by generating frequency tables for each of the survey items. Having automated data collection and entry via Qualtrics, no inaccuracies were discovered.

Next, missing data was analyzed. As described in Chapter III, of 141 total participants, 18 responses were flagged for missing data. Chi-square analyses, Fisher exact tests (in instances in which chi squares were unable to be computed due to low sample size within specific categories), and independent samples t-tests (for continuous demographic variables, i.e. age) were conducted in order to evaluate group differences between participants who provided incomplete responses and those who completed the survey in its entirety. No statistically significant demographic differences were found between those who completed the study and those who provided incomplete responses ( $p$  values ranged from .05 to 1.00); accordingly, incomplete responses were excluded from further analysis, resulting in a sample size of  $N = 123$ . Alternative strategies for handling missing data, such as imputing data or employing higher order statistical models that accommodate missing data were rejected as unnecessary and superfluously

cumbersome.

Normality tests were conducted to evaluate the distributions of scores for all continuous variables. Results of these tests indicated that the P-SAAS, NM-SAAS, NS-SAAS, and PCURQ data were normally distributed. Univariate outlier analysis was conducted using the procedure proposed by Hoaglin and Iglewicz (1987). No outliers were found in any of the SAAS subscale data. Two outliers were discovered in the PCURQ data. Subsequent case-by-case investigation of both response sets suggested that in both instances, outliers were not obviously attributable to random responding. Accordingly, it is reasonable to believe that outliers in the data represent true variation within the sample. As normality tests indicated that data for the PCURQ were normally distributed, it was decided that these outliers would be maintained in the dataset. Descriptive statistics for each of the four aforementioned measures, and correlations between these measures, are presented in Table 4.1.

Table 4.1

*Means, Standard Deviations, and Correlations for Scores on the PCURQ, P-SAAS, NM-SAAS, and NS-SAAS*

Measure	<i>M</i>	<i>SD</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
1. PCURQ	16.19	3.09	–	-.34*	-.14	-.26*
2. P-SAAS	31.56	5.13	-.34*	–	.37*	.43*
3. NM-SAAS	34.85	3.72	-.14	.37*	–	.54*
4. NS-SAAS	39.18	4.02	-.26*	.43*	.54*	–

Note. *N* = 123.

\* *p* < .01

Unlike scores on the PCURQ, P-SAAS, NM-SAAS, and NS-SAAS, tests of normality revealed that the distribution of scores on the CUPIT (*M* = 8.41, *SD* = 5.70) was positively skewed (skewness = 2.82) and leptokurtic (kurtosis = 11.70). While non-normal, this distribution is not surprising. Only 44 participants of 123 (specifically, those who endorsed current cannabis use) received the CUPIT; the remaining 79 automatically received scores of 0 on this measure, as

responses on the measure are based on past-year cannabis use. This explains the disproportionate number of 0-value scores, resulting in the leptokurtic distribution observed. Additionally, among those 44 respondents who did complete the CUPIT, the majority of scores were quite low (mode = 5; skewness for distribution of current cannabis users' scores = 2.94, kurtosis = 10.94); this too would be expected, given that higher scores on the CUPIT indicate greater risk of problem cannabis use (a characteristic which one would not expect to be prevalent among doctoral psychology trainees). As the CUPIT was originally developed as a screening measure, the decision was made to dichotomize scores on this measure utilizing the identified cutoff score of 12 (see Bashford et al., 2010), rather than transform the data in order to correct for the non-normal distribution; accordingly, participants who scored 12 or above were categorized as “positive” for problem cannabis use, and those with scores 11 or under categorized as “negative.” Upon deciding to utilize the CUPIT as a categorical variable, proposed linear regression analyses were replaced by independent samples t-tests in the statistical analysis plan as methods of analysis for Hypotheses 1c, 2g, 2h, and 2i, improving the ability to make direct comparisons between the results of these hypotheses and Hypotheses 1a, 1b, and 2a through 2f, all of which were to be tested with independent samples t-tests as per the a priori analysis plan.

Following data screening, demographic data were examined for between-group differences. A series of independent samples t-tests, chi-square analyses and Fisher exact tests revealed no significant between-group differences between individuals who denied history of lifetime cannabis use versus those who endorsed history of cannabis use ( $p = .07$  to  $.80$ ), individuals who endorsed past use versus current use ( $p = .09$  to  $.98$ ), and current cannabis users who screened positive on the CUPIT (indicating problem cannabis use) versus those whose CUPIT scores were unremarkable ( $p = .16$  to  $.79$ ).

After assessing the distribution of demographic variables across cannabis use history conditions, data reduction techniques were implemented to remove variables empirically found to lack association with perceptions of cannabis' risks and attitudes toward substance use, and to group sparse demographic categories into more meaningful subsets. The association of demographic factors with perceptions of cannabis' risks and attitudes toward substance use was examined in order to focus the remaining analyses on only those demographics that were associated with the variables of interest. Prior to conducting these analyses, demographic and training characteristic variables that included less than 10 percent of the sample (less than 12 members) were, when possible, combined into meaningful groupings of sufficient size. As no study hypotheses explored demographic differences among the variables of interest, in instances in which more than three categories in a given variable had more than 12 participants, categories were collapsed based on conceptual similarities between groups when possible, such that demographic variables had no more than three categories per variable; this level of coding detail was deemed sufficient to address the question of whether each of the demographic dimensions surveyed were exerting influence on study results. All categorical demographic variables were subsequently dummy coded, and two-factor interaction terms were generated for all possible combinations of demographic variables. (See Appendix J for a taxonomy demonstrating how demographic variables were collapsed and dummy coded, as well as how interaction terms were generated).

To evaluate the influence of demographic variables on perceptions of cannabis' risks and attitudes toward substance use, a systematic sequence of linear regression models was conducted. In order to increase the likelihood that demographic variables which were potentially influential would be retained as controls, those variables and interaction terms that were significantly

related to PCURQ, P-SAAS, NM-SAAS, and NS-SAAS scores at  $p < .2$  (rather than  $p < .05$ ) were retained from each analysis, as per Hosmer, Lemeshow, and Sturdivant's (2013) recommendations; variables which were not significant at  $p < .2$  were dropped from further analysis. Regression analyses were sequenced as follows: First, a series of linear regressions with partial and semipartial correlations were performed with all dummy coded variables entered as predictors; as noted, demographic variables with  $p < .2$  were retained. Next, a series of four linear regressions with partial and semipartial correlations were conducted with all two-factor interaction terms entered as predictors, with interaction terms with  $p < .2$  retained. Last, the combined list of retained demographic variables and interaction terms were entered as predictors in order to understand the influence of each of the previously retained factors on perceptions of cannabis' risks and attitudes toward substance use; factors with  $p < .2$  were again retained. Finally, collinearity diagnostics were utilized to identify those retained demographic variables that were linear combinations of other variables; these factors were subsequently removed, in accordance with Hosmer et al.'s (2013) recommendations, resulting in a finalized list of demographic controls to be retained in subsequent analyses. Driven by findings suggesting that select demographic variables may be associated with perceptions of cannabis' risks and attitudes toward substance use, partial correlation was selected in place of bivariate correlation for Hypothesis 3 in order to isolate the unique correlations between the PCURQ, P-SAAS, NM-SAAS, and NS-SAAS while controlling the influence of demographic factors.

### **Hypothesis 1**

A series of t-tests were utilized to evaluate the relationship between participants' cannabis use history and their perceptions of cannabis' risks, as defined by scores on the PCURQ. Each of these analyses is described below.

### **Hypothesis 1a**

An independent samples t-test was conducted to evaluate the hypothesis that doctoral psychology trainees who reported history of cannabis use would report lower perceptions of cannabis' risks compared to individuals who denied history of cannabis use. The test was significant,  $t(121) = 3.04, p < .01$ . Results indicate that individuals with no lifetime history of cannabis use ( $M = 17.30, SD = 2.38$ ) on average associated greater physical and psychological risks with cannabis use than those who endorsed history of cannabis use ( $M = 15.59, SD = 3.27$ ). The eta square index indicated that seven percent of the variance in PCURQ scores was accounted for by whether or not someone endorsed history of cannabis use, a medium to large effect. This is a nine percent difference between groups across the range of scores (a 0.56- $SD$  difference).

### **Hypothesis 1b**

An independent samples t-test was conducted to evaluate the hypothesis that doctoral psychology trainees' perceptions of cannabis' risks would be lower among those who currently used cannabis than among past users. The test was significant,  $t(78) = 2.63, p < .05$ . Results indicated that individuals who endorsed current cannabis use ( $M = 14.75, SD = 3.52$ ) perceived recreational cannabis use to carry less risk than those who endorsed history of cannabis use but denied current use ( $M = 16.61, SD = 2.62$ ). The eta square index indicated that eight percent of the variance in PCURQ scores was accounted for by endorsement of current cannabis use among participants. This is a 10% difference between groups across the range of scores (a 0.59- $SD$  difference).



### **Hypothesis 1c**

An independent samples t-test was conducted to evaluate the hypothesis that doctoral psychology trainees who screened positive for problem cannabis use would endorse lower perceptions of cannabis' risks than those current users who screened negative for problem cannabis use on the CUPIT. The test was not significant,  $t(42) = -1.00, p = .32$ . Results indicated that individuals who screened positive for problem cannabis use ( $M = 15.88, SD = 3.23$ ) were no less likely to associate risk with cannabis use than those users whose CUPIT scores were unremarkable ( $M = 14.50, SD = 3.58$ ).

### **Hypothesis 2**

Additional t-tests were utilized to evaluate the relationship between participants' cannabis use history and their attitudes toward substance use, as defined by scores on the P-SAAS, NM-SAAS, and NS-SAAS. Each of these analyses is described below.

### **Hypothesis 2a**

An independent samples t-test was conducted to evaluate the hypothesis that doctoral psychology trainees with histories of cannabis use would endorse more permissive attitudes toward substance use than trainees who denied lifetime history of cannabis use. The test was significant,  $t(121) = -5.15, p < .001$ . Results indicate that individuals who have used cannabis ( $M = 33.15, SD = 4.62$ ) are more permissive of substance use than those who deny history of cannabis use ( $M = 28.60, SD = 4.75$ ). The eta square index indicated that 18% of the variance in P-SAAS scores was accounted for by whether or not someone endorsed history of cannabis use, a large effect. This is a 17% difference between groups across the range of scores (a 0.98- $SD$  difference).

### **Hypothesis 2b**

An independent samples t-test was conducted to evaluate the hypothesis that doctoral psychology trainees who reported history of cannabis use would endorse less moralistic attitudes about substance use than trainees who denied history of cannabis use. The test was significant,  $t(121) = -2.37, p < .05$ . Results indicated that individuals who have used cannabis ( $M = 35.43, SD = 3.50$ ) were less likely to view substance use as immoral than participants who denied history of cannabis use ( $M = 33.79, SD = 3.94$ ). The eta square index indicated that four percent of the variance in NM-SAAS scores was accounted for by whether or not someone endorsed history of cannabis use, a small to medium effect. This is a nine percent difference between groups across the range of scores (a  $0.45$ - $SD$  difference).

### **Hypothesis 2c**

An independent samples t-test was conducted to evaluate the hypothesis that doctoral psychology trainees who reported history of cannabis use would endorse less stereotyped attitudes toward substance use than trainees who denied lifetime history of cannabis use. The test was significant,  $t(121) = -2.49, p < .05$ . Results indicated that individuals who have used cannabis ( $M = 39.83, SD = 3.98$ ) are less likely to hold stereotypical views of substance use and those who use substances than participants who deny history of cannabis use ( $M = 37.98, SD = 3.85$ ). The eta square index indicated that five percent of the variance in NS-SAAS scores was accounted for by whether or not someone endorsed history of cannabis use, a small to medium effect. This is a 10% difference between groups across the range of scores (a  $0.47$ - $SD$  difference).

### **Hypothesis 2d**

An independent samples t-test was conducted to evaluate the hypothesis that non-

moralistic attitudes toward substance use would be higher among current cannabis users than those with a history of prior use. The test was not significant,  $t(78) = -.02, p = .99$ . Results indicate that current cannabis users ( $M = 35.43, SD = 3.71$ ) are no more non-moralistic in their attitudes toward substance use than past cannabis users ( $M = 35.42, SD = 3.26$ ).

### **Hypothesis 2e**

An independent samples t-test was conducted to evaluate the hypothesis that current cannabis users would endorse more permissive attitudes toward substance use than past users. The test was significant,  $t(78) = -4.00, p < .001$ . Results indicate that individuals who currently used cannabis ( $M = 34.86, SD = 4.49$ ) were more permissive of substance use than past cannabis users ( $M = 31.06, SD = 3.91$ ). The eta square index indicated that 17% of the variance in P-SAAS scores was accounted for by whether participants endorsed past or current cannabis use, a large effect. This is a 14% difference between groups across the range of scores (a 0.90-*SD* difference).

### **Hypothesis 2f**

An independent samples t-test was conducted to evaluate whether past cannabis users would hold more stereotyped beliefs toward substance use than current users. The test was significant,  $t(78) = -2.24, p < .05$ . Results indicate that current cannabis users ( $M = 40.70, SD = 4.16$ ) were less likely to hold stereotypical views of substance use and individuals who use substances than past cannabis users ( $M = 38.75, SD = 3.51$ ). The eta square index indicated that six percent of the variance in NS-SAAS scores was accounted for by whether participants endorsed past or current cannabis use, a medium effect. This is a 10% difference between groups across the range of scores (a 0.50-*SD* difference).

### **Hypothesis 2g**

An independent samples t-test was conducted to evaluate the hypothesis that problem cannabis users would endorse higher non-moralism toward substance use than current users whose CUPIT scores were unremarkable. Levene's test was violated for this analysis; accordingly, results of a test not assuming homogeneity of variance are reported. Results of this test were not significant,  $t(8.18) = .57, p = .57$ . Results indicated that individuals who screened positive for problem cannabis use ( $M = 34.50, SD = 5.42$ ) were no more non-moralistic than those users whose CUPIT scores were unremarkable ( $M = 35.64, SD = 3.29$ ).

### **Hypothesis 2h**

An independent samples t-test was conducted to evaluate the hypothesis that trainees with problem cannabis use would endorse more permissive attitudes toward substance use than those whose patterns of cannabis use were not indicative of problem use. Results of this test were not significant,  $t(42) = .25, p = .80$ . Results indicated that individuals who screened positive for problem cannabis use ( $M = 34.50, SD = 5.88$ ) were no more permissive of substance use than current cannabis users whose CUPIT scores were unremarkable ( $M = 34.94, SD = 4.22$ ).

### **Hypothesis 2i**

A final independent samples t-test was utilized to evaluate the hypothesis that doctoral psychology trainees with problem cannabis use would endorse higher non-stereotyping toward substance use than current users whose CUPIT screens were negative. Results of this test were not significant,  $t(42) = .62, p = .54$ . Results indicate that individuals who screened positive for problem cannabis use ( $M = 39.88, SD = 4.94$ ) were no less likely to hold stereotypical beliefs about substance use and substance users than those users whose CUPIT scores were unremarkable ( $M = 40.89, SD = 4.03$ ).

### Hypothesis 3

Partial correlation was utilized to examine the relationship between perceptions of cannabis use risks (operationalized by scores on the PCURQ) and attitudes toward substance use (operationalized by P-SAAS, NM-SAAS, and NS-SAAS scores). It was hypothesized that doctoral psychology trainees' perceptions of cannabis' risks would be negatively correlated with trainee permissiveness, non-stereotyping, and non-moralism. Table 4.2 presents the partial correlation coefficients for Hypotheses 3a through 3c, along with the results of exploratory correlation analyses among the three subscales of the SAAS (P-SAAS, NM-SAAS, and NS-SAAS), after controlling for relevant demographic variables. As indicated on the table, participants' perceptions of cannabis' risks were negatively and significantly correlated with scores on the P-SAAS and NS-SAAS. PCURQ scores were not significantly correlated with scores on the NM-SAAS. Results suggest that psychology trainees who associate cannabis use with greater psychological/physical risk also tend to be less permissive of substance use generally and more likely to hold stereotypical beliefs related to substance use and substance users, though perceptions of cannabis' risks are unrelated to the belief that substance use is morally evil or wrong among doctoral psychology trainees. Results of exploratory partial correlation analyses between scores on the P-SAAS, NM-SAAS, and NS-SAAS revealed that all three of the SAAS subscales explored in the current study were positively and significantly correlated, such that respondents who endorsed more permissive attitudes toward substance use also had more non-moralistic and non-stereotypical beliefs about substance use and users.

Table 4.2

*Summary of Partial<sup>a</sup> Correlation Results for Scores on the PCURQ, P-SAAS, NM-SAAS, and NS-SAAS*

Measure	1	2	3	4
1. PCURQ	–	-.27*	-.04	-.26*
2. P-SAAS	-.27*	–	.30**	.32**
3. NM-SAAS	-.04	.30**	–	.55***
4. NS-SAAS	-.26*	.32**	.55***	–

Note.  $N = 123$ .

<sup>a</sup>Controlled variables included Age, Sex, Race, Non-Religious, Other Religious Affiliation, Republican, Other Political Affiliation, Degree Type, Clinical Psychology, Other Discipline, Years of Training, and Internship. Controlled interactions included Age\*Sex, Age\*Degree Type, Age\*Republican, Sex\*Non-Religious, Sex\*Republican, Sex\*Other Political Affiliation, Sex\*Years of Training, Race\*Internship, Other Religious Affiliation\*Republican, Other Religious Affiliation\*Degree Type, Non-Religious\*Degree Type, Non-Religious\*Years of Training, Other Political Affiliation\*Degree Type, Republican\*Years of Training, Republican\*Internship, Other Political Affiliation\*Internship, Degree Type\*Years of Training, Degree Type\*Internship, and Other Discipline\*Internship.

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

#### Hypothesis 4

In order to test the hypothesis that cannabis use history, perceptions of cannabis' risks, and attitudes toward substance use would predict trainees' ability to identify cannabis use disorder, a series of hierarchical logistic regression analyses were conducted. Of the 123 participants included in the study, 95 (77.2%) correctly diagnosed the hypothetical client portrayed in the vignette with cannabis use disorder, while 28 (22.8%) failed to correctly diagnose the client.

Although the original statistical analysis plan indicated that demographic information was to be entered in Step 1, endorsement of past cannabis use in Step 2, endorsement of current cannabis use and risk of cannabis use problems (scores on the CUPIT) in Step 3, and perceptions of cannabis use risks (scores on the PCURQ) and attitudes toward substance use (scores on the P-SAAS, NM-SAAS, and NS-SAAS) in Step 4, it was ultimately determined that the organizational structure of this model would prevent conclusions from being drawn about the applicability of the Theory of Cognitive Dissonance (Festinger, 1957) as a framework for the

influence of personal behaviors and beliefs on diagnostic decision-making. Accordingly, the a priori logistic regression plan was replaced by a series of three hierarchical logistic regression analyses, which better simulated cognitive dissonance. The first of these analyses (Model 1) models the prediction of diagnostic decision based upon perceptions of cannabis' risks and attitudes toward substance use (scores on the PCURQ, P-SAAS, NM-SAAS, and NS-SAAS). The second logistic model tests the cognitive dissonance hypothesis which has served as the framework for this study; by entering history of cannabis use into the model following scores on the PCURQ, P-SAAS, NM-SAAS, and NS-SAAS, this model will demonstrate whether or not individuals' cannabis use accounted for variation in diagnostic decision above and beyond the influence of perceptions of cannabis' risks and attitudes toward substance use. Finally, in the third logistic model, demographic variables were entered in Step 1 – in advance of perceptions of cannabis' risks and attitudes toward substance use (Step 2), as well as cannabis use history (Step 3) – in order to evaluate whether the predictive model is altered by controlling for these factors.

Given the low number of participants who endorsed patterns of problem cannabis use ( $n = 8$ ), in advance of the logistic regression analyses, a Fisher's exact test was conducted to assess whether the diagnostic decisions of current problem cannabis users differed significantly from those of current cannabis users whose CUPIT screens were unremarkable. Results of this analysis were non-significant ( $p = 1.00$ ); accordingly, cannabis users whose CUPIT scores evidenced problem use and those whose scores were unremarkable were combined for all subsequent regression analyses ( $n = 44$ ).

### **Model 1**

A hierarchical logistic regression analysis was conducted to predict accurate diagnosis of cannabis use disorder using perceptions of cannabis' risks and attitudes toward substance use as

predictors. Scores on the PCURQ, P-SAAS, NM-SAAS, and NS-SAAS were entered simultaneously as predictors. Diagnostic decision – whether participants did or did not diagnose cannabis use disorder in the hypothetical client portrayed in the vignette – was entered as the outcome variable. A test of the model versus a constant only model was not statistically significant,  $\chi^2_{model}(4, N = 123) = 4.83, p = .31$ . Statistical significance of the Wald criteria for the PCURQ, P-SAAS, NM-SAAS, and NS-SAAS ranged from  $p = .17$  to  $p = .95$ , indicating that none of the individual predictors made a statistically significant contribution to the predictive ability of the model. Results indicate that perceptions of cannabis' risks and attitudes toward substance use do not predict participants' diagnostic decisions. Nagelkerke's  $R^2$  of .06 indicated that the model explained six percent of the variance in diagnostic decisions among participants. Prediction success overall was 76% (94/123 participants correctly identified), with Model 1 correctly identifying 99% of participants (94/95 participants) who correctly diagnosed cannabis use disorder, but failing to accurately identify any respondents who failed to diagnose the client portrayed in the vignette. Table 4.3 summarizes the analysis results for Model 1.

Table 4.3

*Results of Logistic Regression Analysis for Hypothesis 4, Model 1 (Prediction of Diagnostic Decision by Perceptions of Cannabis' Risks and Attitudes Toward Substance Use)*

Predictor	$\beta^a$	SE	Wald Statistic	OR <sup>b</sup>	95% CI	
					Lower	Upper
PCURQ	-.01	.07	.05	1.00	.86	1.15
P-SAAS	.04	.05	.72	1.04	.95	1.15
NM-SAAS	-.10	.07	1.92	.90	.78	1.04
NS-SAAS	-.07	.07	.88	.94	.82	1.07

Note.  $N = 123$ . None of the variables entered were significant predictors of diagnostic decision.

<sup>a</sup> $\beta$  values represent estimated unstandardized regression coefficients. <sup>b</sup>OR represents the likelihood of correct diagnosis (a response of "yes" to the question "Does John have cannabis use disorder?").

## Model 2

A second hierarchical logistic regression analysis was conducted to evaluate the extent to



which cannabis use history accounted for variance in diagnostic decision-making above the impact of perceptions of cannabis' risks and attitudes toward substance use alone. Scores on the PCURQ, P-SAAS, NM-SAAS, and NS-SAAS were entered simultaneously in Step 1. History of cannabis use (three levels: denied, past, or current) was entered as a categorical predictor into Step 2. Diagnostic decision was again entered as the outcome variable.

A test of the full model versus a constant only model was not statistically significant,  $\chi^2_{model}(6, N = 123) = 10.41, p = .11$ , indicating that cannabis use history, perceptions of cannabis' risks, and attitudes toward substance use were unable to account for variation in diagnostic decision-making among participants. Likewise, a test of the full model versus Model 1 (including perceptions of cannabis' risks and attitudes toward substance use only, see above) was not significant,  $\chi^2_{block}(2, N = 123) = 5.58, p = .06$ , suggesting that the addition of cannabis use history to the logistic model did not significantly improve predictive ability of the model as a whole. Nagelkerke's  $R^2$  of .12 indicated that the model including cannabis use history explained 12% of the variance in diagnostic decisions among participants. Although overall prediction success in Model 2 remained at 76% (94/123 participants), true positive and true negative prediction success shifted, with the new model accurately identifying 98% of participants (93/95 participants) who accurately diagnosed cannabis use disorder and four percent of participants (1/28 participants) who failed to diagnose cannabis use disorder.

While the overall model was not statistically significant, further examination of the component predictors included in Model 2 revealed that one of seven predictors – current cannabis use – made a statistically significant contribution to the predictive ability of the model, Wald criterion = 4.61,  $p < .05$ . Contrary to study hypotheses, however, rather than reduce the odds of correctly identifying cannabis use disorder, individuals who endorsed current cannabis

use were 4.52 times more likely to correctly identify cannabis use disorder than those who denied history of cannabis use, 95% CI [1.14, 17.93]. While it remains the case that Model 2 was not statistically significant, this finding is intriguing, as it suggests the possibility that other factors may be masking the influence of current cannabis use. Table 4.4 summarizes the analysis results for Model 2.

Table 4.4

*Results of Hierarchical Logistic Regression Analysis for Hypothesis 4, Model 2 (Prediction of Diagnostic Decision by Perceptions of Cannabis' Risks, Attitudes Toward Substance Use, and Cannabis Use History<sup>a</sup>)*

Predictor	$\beta^c$	SE	Wald Statistic	OR <sup>d</sup>	95% CI	
					Lower	Upper
PCURQ	.03	.08	.17	1.03	.88	1.21
P-SAAS	-.01	.06	.03	.99	.89	1.11
NM-SAAS	-.09	.07	1.45	.91	.79	1.06
NS-SAAS	-.09	.07	1.52	.92	.80	1.05
Denied cannabis use <sup>b</sup>	–	–	4.99	–	–	–
Past cannabis use	.26	.54	.22	1.29	.45	3.75
Current cannabis use	1.51	.70	4.61 <sup>*</sup>	4.52	1.14	17.93

Note.  $N = 123$ .

<sup>a</sup>Cannabis use history (three levels: denied history, past history, current use) was entered on PCURQ, P-SAAS, NM-SAAS, and NS-SAAS in Step 2 (PCURQ, P-SAAS, NM-SAAS, and NS-SAAS were entered in Step 1, equivalent to Model 1 as presented in Table 4.3). <sup>b</sup>Denied cannabis use was utilized as a reference group for cannabis use history. <sup>c</sup> $\beta$  values represent estimated unstandardized regression coefficients. <sup>d</sup>OR represents the likelihood of a correct diagnosis (a response of “yes” to the question “Does John have cannabis use disorder?”).

<sup>\*</sup> $p < .05$

### Model 3

A final hierarchical logistic regression analysis was conducted to predict diagnostic decisions using cannabis use history, perceptions of cannabis' risks, and attitudes toward substance use as predictors, with relevant demographic variables controlled. The combined demographic variables were entered in Step 1. Subsequent variables were entered in the same order described in Model 2, with perceptions of cannabis' risks and attitudes toward substance use entered in Step 2, and cannabis use history entered as a categorical predictor in Step 3.

Diagnostic decision was entered as the outcome variable.

A test of the model represented in Step 1 was not significant,  $\chi^2(31, N = 123) = 37.65, p = .19$ , indicating that the demographic variables were not independently predictive of diagnostic decision.

After controlling for demographic variables in Step 1, a test of the model with PCURQ, P-SAAS, NM-SAAS, and NS-SAAS scores entered as predictors was conducted to predict diagnostic decisions from perceptions of cannabis' risks and attitudes toward substance use, controlling for demographic variables. A test of the full model against a constant only model was not significant,  $\chi^2_{model}(35, N = 123) = 41.21, p < .22$ , as was a test of the revised model against the previous model,  $\chi^2_{block}(4, N = 123) = 3.56, p = .47$ , indicating that including perceptions of cannabis' risks and attitudes toward substance use in the model neither predicted diagnostic decisions nor improved model fit substantially. Statistical significance of the Wald criteria for perceptions of cannabis' risks and each of the attitudes toward substance use ranged from  $p = .35$  to  $p = .91$ , indicating that none of these predictors individually made a statistically significant contribution to the predictive ability of the model.

A test of the full model including PCURQ, P-SAAS, NM-SAAS, and NS-SAAS scores, cannabis use history, and demographic variables was conducted to evaluate whether perceptions of cannabis' risks, attitudes toward substance use, and cannabis use behavior predicted diagnostic decisions, controlling for demographic factors. A test of the full model against a constant only model was significant,  $\chi^2_{model}(37, N = 123) = 56.89, p < .05$ . Further, results indicated that the addition of cannabis use history significantly improved model fit,  $\chi^2_{block}(2, N = 123) = 15.68, p < .001$ . Nagelkerke's  $R^2$  of .56 indicated that the model including cannabis use history explained 56% of the variance in diagnostic decisions among participants. Prediction

success overall was 87% (107/123 participants), with the model illustrated by Step 3 correctly identifying 61% of participants who failed to make the correct diagnosis (17/28 participants) and 95% of participants (90/95 participants) who correctly diagnosed cannabis use disorder.

Although none of the demographic factors controlled for in the model made statistically significant contributions to the model independently ( $p$  values ranged from .12 to 1.00 in Step 1, .08 to 1.00 in Step 2, and .07 to 1.00 in Step 3), controlling these variables strengthened the relationship between history of personal cannabis use and diagnostic decision; specifically, when demographic variables were accounted for within the model, the odds that individuals who endorsed current cannabis use would correctly identify cannabis use disorder in the vignette as compared to individuals who denied cannabis use history rose over eleven times, with individuals who endorsed current cannabis use now 51.03 (versus 4.52, as in Model 2) times more likely to correctly identify cannabis use disorder in the vignette than those who denied lifetime history of recreational cannabis use, 95% CI [3.94, 660.64]. Results suggest that controlling for demographic factors unmasked the effect of current cannabis use in predicting participants' diagnostic decisions. Table 4.5 summarizes the analysis results for Model 3.

Table 4.5

*Results of Hierarchical Logistic Regression Analysis for Hypothesis 4, Model 3 (Prediction of Diagnostic Decision by Perceptions of Cannabis' Risks, Attitudes Toward Substance Use, and Cannabis Use History<sup>a</sup>, with Demographic Variables Controlled<sup>b</sup>)*

Predictor	$\beta^c$	SE	Wald Statistic	OR <sup>d</sup>	95% CI	
					Lower	Upper
Step 1						
Control variables	—	—	—	—	—	—
Step 2 <sup>e</sup>						
Control variables	—	—	—	—	—	—
PCURQ	.01	.11	.01	1.01	.82	1.25
P-SAAS	.02	.08	.07	1.02	.89	1.17
NM-SAAS	-.09	.10	.89	.91	.75	1.10
NS-SAAS	-.08	.10	.62	.93	.76	1.12
Step 3 <sup>f</sup>						
Control variables	—	—	—	—	—	—
PCURQ	.16	.14	1.23	1.71	.89	1.55
P-SAAS	-.09	.09	.99	.92	.77	1.09
NM-SAAS	-.06	.11	.33	.94	.76	1.16
NS-SAAS	-.11	.12	.94	.89	.71	1.21
Denied cannabis use <sup>g</sup>	—	—	9.77*	—	—	—
Past cannabis use	.18	.81	.05	1.20	.25	5.83
Current cannabis use	3.93	1.31	9.06*	51.03	3.94	660.64

Note.  $N = 123$ .

<sup>a</sup>Cannabis use history included three levels: denied history, past history, current use. <sup>b</sup>Controlled variables included Age, Sex, Race, Non-Religious, Other Religious Affiliation, Republican, Other Political Affiliation, Degree Type, Clinical Psychology, Other Discipline, Years of Training, and Internship. Controlled interactions included Age\*Sex, Age\*Degree Type, Age\*Republican, Sex\*Non-Religious, Sex\*Republican, Sex\*Other Political Affiliation, Sex\*Years of Training, Race\*Internship, Other Religious Affiliation\*Republican, Other Religious Affiliation\*Degree Type, Non-Religious\*Degree Type, Non-Religious\*Years of Training, Other Political Affiliation\*Degree Type, Republican\*Years of Training, Republican\*Internship, Other Political Affiliation\*Internship, Degree Type\*Years of Training, Degree Type\*Internship, and Other Discipline\*Internship;  $p$  values were non-significant. <sup>c</sup> $\beta$  values represent estimated unstandardized regression coefficients. <sup>d</sup>OR represents the likelihood of a correct diagnosis (a response of "yes" to the question "Does John have cannabis use disorder?"). <sup>e</sup>PCURQ, P-SAAS, NM-SAAS, and NS-SAAS were entered on demographic controls in Step 2. <sup>f</sup>Cannabis use history was entered on PCURQ, P-SAAS, NM-SAAS, NS-SAAS, and demographic controls in Step 3. <sup>g</sup>Denied cannabis use was utilized as a reference group for cannabis use history.

\*  $p < .01$

## Post Hoc Analyses

After concluding all hypothesis-testing analyses, a final question remained: What is the influence of doctoral psychology trainees' training in the diagnosis and treatment of substance use disorders specifically on the likelihood that they will accurately diagnose cannabis use disorder? Although personal experiences and beliefs might understandably influence trainees' clinical judgments in lieu of formalized training in the assessment and treatment of substance use disorders, if doctoral students had completed training – whether didactic or experiential – on substance use disorders, trainees, graduate faculty, and practicum/internship supervisors might reasonably assume that these experiences would inform and improve trainees' ability to identify and diagnose cannabis use disorder.

To evaluate the impact of substance use disorder training on diagnosis of cannabis use disorder, two post hoc hierarchical logistic regression analyses were conducted. In the first, demographic controls as determined in prior analyses were entered in Step 1 in order to control the effects of these variables. Substance use disorder training history (whether or not trainees endorsed any history of graduate training in substance use disorders specifically) was entered as a bivariate predictor in Step 2. Consistent with the order of predictors in prior models, perceptions of cannabis' risks and attitudes toward substance use were entered into Step 3, and cannabis use history was entered in Step 4. Diagnostic decision – whether participants did or did not diagnose cannabis use disorder in the hypothetical client portrayed in the vignette (the same outcome variable used in previous logistic models) – was entered as the outcome variable. (Note: Results of this analysis will be reported beginning with Step 2, as the results of Step 1 have been reported in prior analyses.)

After entering demographic variables in Step 1, a test of the model with endorsement of

substance use disorder training was conducted to predict accurate diagnosis of cannabis use disorder from history of graduate training in addiction. A test of this model against a constant only model was not significant,  $\chi^2_{model}(32, N = 123) = 37.77, p = .22$ , nor was a test of the revised model against the previous model, which included demographic controls only,  $\chi^2_{block}(1, N = 123) = .12, p = .73$ , indicating that endorsement of training in substance use disorders did not reliably distinguish between participants who correctly diagnosed cannabis use disorder and those who failed to diagnose cannabis use disorder. Nagelkerke's  $R^2$  of .40 indicated that the model explained 40% of the variance in diagnostic decisions among participants. Prediction success overall was 81% (99/123 participants), with the model illustrated by Step 2 correctly identifying 96% of participants who correctly diagnosed cannabis use disorder (91/95 participants) and 29% of respondents who failed to diagnose the client portrayed in the vignette (8/28 participants).

Next, a test of the model with PCURQ, P-SAAS, NM-SAAS, and NS-SAAS entered in Step 3 was conducted. A test of the full model against a constant only model was not significant,  $\chi^2_{model}(36, N = 123) = 41.46, p = .25$ , nor was a test of the revised model against the previous model,  $\chi^2_{block}(4, N = 123) = 3.69, p = .45$ . Statistical significance of the Wald criteria for the PCURQ, P-SAAS, NM-SAAS, and NS-SAAS ranged from  $p = .38$  to .94, indicating that the predictive ability of these variables was neither significantly reduced nor enhanced by the addition of substance use disorder training to the model. Nagelkerke's  $R^2$  of .44 indicated that the model explained 44% of the variance in diagnostic decisions among participants. Prediction success overall was 80% (98/123 participants), with the model illustrated by Step 3 correctly identifying 95% of participants who correctly diagnosed cannabis use disorder (90/95 participants) and 29% of respondents who failed to diagnose the client portrayed in the vignette (8/28 participants).

Last, a test of the model with cannabis use history entered in Step 4 was conducted. A test of the full model against a constant only model was significant,  $\chi^2_{model}(38, N = 123) = 57.81$ ,  $p < .05$ , as was a test of the revised model against the previous model,  $\chi^2_{block}(2, N = 123) = 16.36$ ,  $p < .001$ . As in Model 3 (Prediction of Diagnostic Decision by Perceptions of Cannabis' Risks, Attitudes toward Substance Use, and Cannabis Use History, with Demographic Variables Controlled), a review of the Wald criteria revealed that current cannabis use was the only significant predictor of diagnostic decision, Wald criterion = 9.60,  $p < .01$ . Nagelkerke's  $R^2$  of .57 indicated that the model explained 57% of the variance in diagnostic decision among participants. Prediction success overall was 85% (105/123 participants), with the model illustrated by Step 4 correctly identifying 95% of participants who correctly diagnosed cannabis use disorder (90/95 participants) and 54% of respondents who failed to diagnose the client portrayed in the vignette (15/28 participants). Although substance use disorder training in and of itself was not a significant predictor of diagnostic judgments among doctoral psychology trainees, it is apparent that inclusion of this variable in the logistic model enhanced the effect of current cannabis use slightly; review of the odds ratio for current cannabis use in this model indicates that current cannabis users were 58.57 times more likely to correctly identify cannabis use disorder than those who denied lifetime history of recreational cannabis use (compared to 51.03 in Model 3), 95% CI [4.46, 769.14]. Table 4.6 summarizes the descriptive statistics and analysis results for this model.



Table 4.6

*Results of Hierarchical Logistic Regression for Post Hoc Analysis 1 (Influence of Substance Use Disorder Training History on the Predictive Ability of Logistic Regression Model 3)*

Predictor	$\beta^a$	SE	Wald Statistic	OR <sup>b</sup>	95% CI	
					Lower	Upper
Step 1						
Control variables <sup>c</sup>	–	–	–	–	–	–
Step 2 <sup>d</sup>						
Control variables	–	–	–	–	–	–
Training	.25	.71	.12	1.28	.32	5.13
Step 3 <sup>e</sup>						
Control variables	–	–	–	–	–	–
Training	.37	.75	.25	1.45	.34	6.25
PCURQ	.01	.11	.01	1.01	.82	1.25
P-SAAS	.02	.07	.05	1.02	.88	1.17
NM-SAAS	-.09	.10	.78	.92	.76	1.11
NS-SAAS	-.09	.10	.74	.92	.76	1.12
Step 4 <sup>f</sup>						
Control variables	–	–	–	–	–	–
Training	.83	.86	.93	2.30	.42	12.47
PCURQ	.13	.15	.74	1.14	.85	1.52
P-SAAS	-.09	.09	1.13	.91	.77	1.08
NM-SAAS	-.05	.11	.17	.96	.77	1.19
NS-SAAS	-.15	.12	1.49	.86	.68	1.10
Denied cannabis use <sup>g</sup>	–	–	10.28*	–	–	–
Past cannabis use	.19	.82	.06	1.21	.25	6.01
Current cannabis use	4.07	1.31	9.60*	58.57	4.46	769.14

Note.  $N = 123$ .

<sup>a</sup> $\beta$  values represent estimated unstandardized regression coefficients. <sup>b</sup>OR represents the likelihood of a correct diagnosis (a response of “yes” to the question “Does John have cannabis use disorder?”). <sup>c</sup>Controlled variables included Age, Sex, Race, Non-Religious, Other Religious Affiliation, Republican, Other Political Affiliation, Degree Type, Clinical Psychology, Other Discipline, Years of Training, and Internship. Controlled interactions included Age\*Sex, Age\*Degree Type, Age\*Republican, Sex\*Non-Religious, Sex\*Republican, Sex\*Other Political Affiliation, Sex\*Years of Training, Race\*Internship, Other Religious Affiliation\*Republican, Other Religious Affiliation\*Degree Type, Non-Religious\*Degree Type, Non-Religious\*Years of Training, Other Political Affiliation\*Degree Type, Republican\*Years of Training, Republican\*Internship, Other Political Affiliation\*Internship, Degree Type\*Years of Training, Degree Type\*Internship, and Other Discipline\*Internship.

<sup>d</sup>Substance use disorder training (endorsed) was entered on demographic controls in Step 2. <sup>e</sup>PCURQ, P-SAAS, NM-SAAS, and NS-SAAS were entered on substance use disorder training (endorsed) and demographic controls in Step 3. <sup>f</sup>Cannabis use history (three levels: denied, past, and current) was entered on demographic controls, substance use disorder training (endorsed), PCURQ, P-SAAS, NM-SAAS, and NS-SAAS in Step 3. <sup>g</sup>Denied cannabis use was utilized as a reference group for cannabis use history.

\*  $p < .01$

After determining that substance use disorder training was not a significant predictor of diagnostic accuracy among study participants, a final logistic regression analysis was conducted to determine whether more intensive forms of training in substance use disorder treatment might predict increased diagnostic accuracy among study participants. While the initial post hoc analysis included participants whose training in substance use disorders was potentially limited to having completed a graduate-level course on substance use disorder treatment or attended a workshop or conference this topic (among other didactic or less intensive training experiences), the current analysis limited the definition of training to (a) training toward certification or completion of certification as a substance abuse counselor, and/or (b) externship, internship, or similar clinical training experiences in which substance use disorder treatment was a primary focus. These two categories of training were retained because they represent two of the most intensive forms of clinical training in substance use disorders available to doctoral psychology trainees. Although requirements vary by state, substance abuse counselors are typically required to complete thousands of clinical hours (e.g., in New Jersey, Certified Alcohol and Drug Counselors must complete 3,000 supervised clinical hours in substance use disorder treatment settings; New Jersey Department of Human Services, 2012), while doctoral psychology trainees who select to complete externships in addiction treatment settings would be expected to accumulate at least 480 hours of addiction treatment experience over the course of a training year (e.g, see Seton Hall University, 2009).

To evaluate the impact of intensive substance use disorder training (to be referred to subsequently as “intensive training”) on diagnosis of cannabis use disorder, demographic controls as determined in prior analyses were entered in Step 1 in order to control the effects of these variables. Endorsement of history of intensive training was entered as a bivariate predictor in Step

2. Consistent with the order of predictors in previous logistic models, perceptions of cannabis' risks and attitudes toward substance use were entered into Step 3, and cannabis use history was entered in Step 4. Diagnostic decision was entered as the outcome variable. (Note: Results of this analysis will be reported beginning with Step 2, as the results of Step 1 have been reported in prior analyses.)

After entering demographic variables in Step 1, a test of the model with endorsement of intensive training was conducted to predict accurate diagnosis of cannabis use disorder from history of specialized training in addiction. A test of this model against a constant only model was not significant,  $\chi^2_{model}(32, N = 123) = 37.73, p = .22$ , nor was a test of the revised model against the previous model, which included demographic controls only,  $\chi^2_{block}(1, N = 123) = .08, p = .78$ , indicating that endorsement of intensive training did not reliably distinguish between participants who correctly diagnosed cannabis use disorder and those who failed to correctly diagnose cannabis use disorder. Nagelkerke's  $R^2$  of .40 indicated that the model explained 40% of the variance in diagnostic decisions among participants. Prediction success overall was 80% (98/123 participants), with the model illustrated by Step 2 correctly identifying 96% of participants who correctly diagnosed cannabis use disorder (91/95 participants), and 25% of respondents who failed to diagnose the client portrayed in the vignette (7/28 participants).

Next, a test of the model with PCURQ, P-SAAS, NM-SAAS, and NS-SAAS entered in Step 3 was conducted. A test of the full model against a constant only model was not significant,  $\chi^2_{model}(36, N = 123) = 41.43, p = .25$ , nor was a test of the revised model against the previous model,  $\chi^2_{block}(4, N = 123) = 3.71, p = .45$ . Statistical significance of the Wald criteria for the perceptions of cannabis' risks and attitudes toward substance use variables ranged from  $p = .33$  to .86, indicating that the predictive ability of these variables was neither significantly reduced nor

enhanced by the addition of intensive training to the model. Nagelkerke's  $R^2$  of .44 indicated that the model explained 44% of the variance in diagnostic decisions among participants. Prediction success overall was 80% (98/123 participants), with the model illustrated by Step 3 correctly identifying 95% of participants who correctly diagnosed cannabis use disorder (90/95 participants), and 29% of respondents who failed to diagnose the client portrayed in the vignette (8/28 participants).

Last, a test of the model with cannabis use history entered in Step 4 was conducted. A test of the full model against a constant only model was significant,  $\chi^2_{model}(38, N = 123) = 58.90, p < .05$ , as was a test of the revised model against the previous model,  $\chi^2_{block}(2, N = 123) = 17.46, p < .001$ . As in Model 3 (Prediction of Diagnostic Decision by Perceptions of Cannabis' Risks, Attitudes Toward Substance Use, and Cannabis Use History, with Demographic Variables Controlled) and the previously described post hoc logistic model (Influence of Substance Use Disorder Training History on the Predictive Ability of Logistic Regression Model 3), a review of the Wald criteria revealed that current cannabis use was the only significant predictor of diagnostic decision, Wald criterion = 9.47,  $p < .01$ . Nagelkerke's  $R^2$  of .58 indicated that the model explained 58% of the variance in diagnostic decisions among participants. Prediction success overall was 86% (106/123 participants), with the model illustrated by Step 4 correctly identifying 93% of participants who correctly diagnosed cannabis use disorder (88/95 participants) and 64% of respondents who failed to diagnose the client portrayed in the vignette (18/28 participants). Although intensive training in and of itself was not determined to be a significant predictor of diagnostic judgments among doctoral psychology trainees, it is apparent that inclusion of this variable in the logistic model enhanced the effect of current cannabis use; review of the odds ratio for current cannabis use in this model indicated that current cannabis

users were 73.98 times more likely to correctly identify cannabis use disorder than those who denied history of cannabis use (compared to 58.57 in the prior post hoc model), 95% CI [4.77, 1146.37]. Table 4.7 summarizes the descriptive statistics and analysis results for this model.

Table 4.7

*Results of Hierarchical Logistic Regression for Post Hoc Analysis 2 (Influence of Intensive Substance Use Disorder Training History on the Predictive Ability of Logistic Regression Model 3)*

Predictor	$\beta^a$	SE	Wald Statistic	OR <sup>b</sup>	95% CI	
					Lower	Upper
Step 1						
Control variables <sup>c</sup>	–	–	–	–	–	–
Step 2 <sup>d</sup>						
Control variables	–	–	–	–	–	–
Intensive training	.18	.65	.08	1.20	.34	4.24
Step 3 <sup>e</sup>						
Control variables	–	–	–	–	–	–
Intensive training	.32	.69	.22	1.38	.36	5.37
PCURQ	.02	.11	.03	1.02	.82	1.26
P-SAAS	.02	.07	.04	1.02	.88	1.17
NM-SAAS	-.10	.10	.95	.91	.75	1.10
NS-SAAS	-.07	.10	.57	.93	.77	1.13
Step 4 <sup>f</sup>						
Control variables	–	–	–	–	–	–
Intensive training	1.20	.89	1.83	3.32	.58	18.86
PCURQ	.16	.15	1.18	1.18	.88	1.58
P-SAAS	-.10	.09	1.28	.90	.75	1.08
NM-SAAS	-.07	.11	.44	.93	.75	1.16
NS-SAAS	-.13	.12	1.17	.88	.70	1.11
Denied cannabis use <sup>g</sup>	–	–	10.33*	–	–	–
Past cannabis use	-.01	.84	< .001	.99	.19	5.12
Current cannabis use	4.30	1.40	9.47*	73.98	4.77	1146.37

Note.  $N = 123$ .

<sup>a</sup> $\beta$  values represent estimated unstandardized regression coefficients. <sup>b</sup>OR represents the likelihood of a correct diagnosis (a response of “yes” to the question “Does John have cannabis use disorder?”). <sup>c</sup>Controlled variables included Age, Sex, Race, Non-Religious, Other Religious Affiliation, Republican, Other Political Affiliation, Degree Type, Clinical Psychology, Other Discipline, Years of Training, and Internship. Controlled interactions included Age\*Sex, Age\*Degree Type, Age\*Republican, Sex\*Non-Religious, Sex\*Republican, Sex\*Other Political Affiliation, Sex\*Years of Training, Race\*Internship, Other Religious Affiliation\*Republican, Other Religious Affiliation\*Degree Type, Non-Religious\*Degree Type, Non-Religious\*Years of Training, Other Political Affiliation\*Degree Type, Republican\*Years of Training, Republican\*Internship, Other Political Affiliation\*Internship, Degree Type\*Years of Training, Degree Type\*Internship, and Other Discipline\*Internship. <sup>d</sup>Intensive training (endorsed) was entered on demographic controls in Step 2. <sup>e</sup>PCURQ, P-SAAS, NM-SAAS, and NS-SAAS were entered on intensive training (endorsed) and demographic controls in Step 3. <sup>f</sup>Cannabis use history (three levels: denied, past, and current) was entered on demographic controls, intensive training (endorsed), PCURQ, P-SAAS, NM-SAAS, and NS-SAAS in Step 4. <sup>g</sup>Denied cannabis use was utilized as a reference group for cannabis use history.

\* $p < .01$

## Chapter V

### Discussion

Paradoxically, as cannabis use – and in turn, cannabis use disorder – becomes more frequent, it is less likely to be seen as a potential problem by the general public. As such, it is critical that mental healthcare professionals – particularly the next generation of mental healthcare professionals, who will inevitably see increasing rates of cannabis use disorder – be able to accurately identify problem cannabis use. The present study was developed to explore the impact of doctoral psychology trainees' personal cannabis use histories on their perceptions of cannabis' risks and attitudes toward substance use. Additionally, the study sought to explore whether doctoral psychology trainees' personal cannabis use, beliefs about the risk of harm from cannabis, and non-moralistic, permissive, and non-stereotypical attitudes toward substance use predicted their identification of cannabis use disorder in a hypothetical client.

### Results of Hypotheses

#### Hypothesis 1

Hypothesis 1 examined differences in perceptions of cannabis' risks among individuals with varying histories of cannabis use. Consistent with the findings of Kondrad and Reid's 2013 study of family physicians, individuals who denied lifetime history of cannabis use associated greater risk with cannabis use (as defined by scores on the PCURQ) than those who endorsed some period of use, as predicted in Hypothesis 1a. Similarly, participants who identified themselves as past cannabis users associated greater risk with cannabis use than current cannabis users, as predicted by Hypothesis 1b.

Although the current study posits that individuals' attitudes toward cannabis use are biased by their personal cannabis use histories, methodological limitations inherent in cross-

sectional, non-experimental research limit the extent to which causal inferences may be drawn from the findings of Hypothesis 1a. As such, although it is possible that individuals who have used cannabis are less likely to associate medical and mental health risks with cannabis use because doing so would result in psychological discomfort, one could equally argue that individuals who ultimately choose to use cannabis recreationally do so because they believe it to be a low-risk behavior, and conversely, that those who have abstained from cannabis use have done so because of underlying beliefs about the risks associated with cannabis use.

Whereas the results of Hypothesis 1a cannot be utilized to infer that individuals' cannabis use influences their beliefs about the risks of cannabis use, the results of Hypothesis 1b indicate that perceptions of cannabis use's risks vary based on recency of personal cannabis use, lending weight to the proposed cognitive dissonance model. Although the present study cannot definitively rule out the possibility that past and current cannabis users held different attitudes about cannabis' risks prior to the onset of their cannabis use, in light of literature supporting the role of cognitive dissonance in the relationship between substance use and beliefs about substance use (e.g., see Halpern, 1994; McMaster & Lee, 1991; Peretti-Watel, 2006; Tagliacozzo, 1979), it is reasonable to conclude that the variation in beliefs about cannabis use's risks among past versus current cannabis users is evidence that individuals who use cannabis recreationally alter their attitudes toward cannabis in order to align these attitudes with their use, in doing so neutralizing the discomfort of behaving in ways inconsistent with one's beliefs.

Contrary to the prediction put forward in Hypothesis 1c, current cannabis users who screened positive for problem cannabis use did not differ in their perceptions of cannabis use's risks from those who screened negative. Viewed within the context of the cognitive dissonance model which serves as the theoretical foundation of the present study, this finding suggests that

neutralizing or altering one's beliefs about the risks of cannabis use may perpetuate cannabis use, but not in and of itself support the development and maintenance of problem use. While problem cannabis use likely has many other adverse impacts on doctoral psychology trainees' personal and professional lives (as might any other form of problem substance use), results of the current study do not suggest that problem cannabis use places a unique burden on beliefs about cannabis' risks above and beyond that of current cannabis use behavior generally.

While the present study found statistically significant differences in beliefs about the risks associated with cannabis use among doctoral psychology trainees based on trainees' history and recency of cannabis use, it is arguably of greater importance to consider the practical significance of such findings. Trainees who denied history of cannabis use versus those who endorsed lifetime cannabis use demonstrated only a 1.71-point difference in mean PCURQ scores, equivalent to nine percent of the total observed range of scores. Similarly, the difference in mean PCURQ scores between past and current cannabis users was only 1.86 points, equivalent to 10% of the observed range of scores. Whether these arguably slight differences between groups have any meaningful bearing on trainees' clinical work or client outcomes – e.g., via influence on diagnostic decision-making, provision of clinical interventions, etc. – is unknown; this will be considered to some extent further below.

## **Hypothesis 2**

Hypothesis 2 theorized that doctoral psychology trainees' attitudes toward substance use – specifically, whether they held moralistic, stereotypical, or permissive attitudes toward substance use – would vary systematically based on trainees' personal cannabis use histories. Hypotheses 2a through 2c explored attitudinal differences between individuals who denied lifetime history of cannabis use and those who endorsed history of use. Hypotheses 2d through 2f



examined differences in these three attitudes among current versus past cannabis users.

Hypotheses 2g through 2i examined differences between current users with negative CUPIT screens versus problem cannabis users.

Consistent with study hypotheses, statistical analyses for Hypotheses 2a through 2c revealed that individuals who endorsed history of cannabis use held more permissive, non-moralistic, and non-stereotyped attitudes toward substance use than participants who denied history of use.

Surprisingly, the results of statistical analyses for Hypotheses 2d through 2f varied by attitude. While current cannabis users were more permissive of substance use and held less stereotypical beliefs about substances users than past cannabis users, past and current cannabis users did not differ significantly on non-moralism.

Lastly, consistent with the findings of Hypothesis 1c, results of Hypotheses 2g through 2i suggest that current cannabis users tended to have similar attitudes toward substance use, regardless of whether their personal cannabis use patterns were indicative of problem use.

Although Hypotheses 2a through 2i were originally grouped by independent variable, as shown above (with 2a through 2c examining differences in the three attitudes among denied versus endorsed lifetime cannabis users, 2d through 2f examining differences in past versus current users, and 2g through 2i differences in current users with negative versus positive CUPIT screens), for ease of interpretation, they will subsequently be grouped and discussed by dependent variable.

#### **Influence of Cannabis Use History on Permissiveness – Hypotheses 2a, 2e, and 2h.**

As previously noted, the results of Hypothesis 2a indicated that individuals who endorsed history of cannabis use held more permissive attitudes toward substance use than those who denied

history of cannabis use. Likewise, the results of Hypothesis 2b indicated that individuals who identified as current cannabis users endorsed higher permissiveness toward substance use than those who identified as past cannabis users. This pattern of findings parallels the results of Hypotheses 1a and 1b, described above; similar to those results, the findings for trainee permissiveness suggest that variation in the belief that “substance use [exists] within a continuum of normal human behavior” (Linden, 2010, p. 380) among trainees varies by trainee cannabis use history. This in turn indicates that permissive attitudes are maintained by the maintenance of cannabis use, as non-permissiveness toward substance use would be akin to the belief that one’s own behavior was abnormal, a contradiction which would likely result in marked cognitive dissonance.

Likewise, results of Hypothesis 2h, which indicated that trainee permissiveness did not significantly differ among those current users who screened positive versus negative on the CUPIT, parallel the findings of Hypothesis 1c. Consistent with the proposed interpretation of findings for the former hypothesis, the results of Hypothesis 2h suggest that increasing one’s permissiveness toward substance use may perpetuate cannabis use, but not in and of itself support the development and maintenance of problem cannabis use.

#### **Influence of Cannabis Use History on Non-Stereotyping – Hypotheses 2c, 2f, and 2i.**

The findings of Hypotheses 2c, 2f, and 2i replicate the pattern of results found for both trainee perceptions of cannabis use risks (Hypothesis 1) and trainee permissiveness (Hypotheses 2a, e, and h). As with these findings, the results of Hypothesis 2c indicated that individuals who had never used cannabis held more stereotypical beliefs about substance use than those who endorsed history of cannabis use. Likewise, the results of Hypothesis 2f indicated that individuals who reported past cannabis use were more stereotyping in their attitudes toward individuals who use

substances than those who endorsed current cannabis use. Once again, there are no differences in stereotyping between those with positive CUPIT screens and those with negative CUPIT screens.

Thus far, the current study has discussed the impact of doctoral psychology trainees' cannabis use as a risk factor for biased clinical judgment. However, it must be acknowledged that those trainees who have used cannabis may, in fact, possess select attitudes that could reasonably be described as beneficial in the context of clinical work, perhaps largely due to their personal experiences with substance use. The observed group differences in stereotyping seen among individuals who have and have not used cannabis may, for example, indicate that individuals who have used cannabis – particularly if they are current cannabis users – are less likely to make assumptions about individuals' substance use based on their appearance (a frequent theme in items on the NS-SAAS). The implications of this difference will be explored further below.

#### **Influence of Cannabis Use History on Non-Moralism – Hypotheses 2b, 2d, and 2g.**

Diverging from the pattern of results seen in trainee scores on the PCURQ, P-SAAS, and NS-SAAS, the results of scores on the NM-SAAS varied by history of cannabis use, but not by recency of use. Specifically, while individuals who endorsed history of cannabis use were less likely to agree with statements that described substance use as morally wrong or evil than those who denied cannabis use history, there were no significant differences in moralism between past and current cannabis users.

It is unclear why non-moralism, but not permissiveness, non-stereotyping, or beliefs about the risks associated with cannabis use, appears not to be influenced by whether participants currently use cannabis. In keeping with the line of reasoning put forth above, which posits that attitudes which vary by recency of cannabis use may be motivated by cognitive dissonance, non-

moralism may represent an attitude which preceded the onset of cannabis use in the current sample. It is also possible that moralistic attitudes are not logically inconsistent with cannabis use, and therefore, do not activate cognitive dissonance (and subsequent neutralization of moralistic beliefs). Lastly, it is possible that the observed results of the present study indicate that moralistic attitudes are influenced by history of cannabis use behavior, but that in contrast to the other attitudes explored in the current study, are maintained regardless of whether cannabis use is discontinued. Methodological limitations of the present study impede confirmation of any of these causal theories; however, to the extent that moralism among doctoral psychology trainees may potentially influence their work, further exploration of moralism/non-moralism among future psychologists is warranted. Were it the case that history of cannabis use influenced moralistic attitudes, it is possible, as noted above with regard to non-stereotyping attitudes, that history of cannabis use may carry certain benefits for doctoral psychology trainees in their clinical work. The possibility that identifying as someone who has used cannabis – with the unique attitudinal profile such an identity appears to be accompanied by – may have advantages will be explored further later in this chapter.

**Additional considerations for Hypothesis 2: Statistical versus practical significance.**

As with Hypothesis 1, it is apt to consider the practical significance of the findings associated with Hypothesis 2. As described in Chapter III, between-group differences ranged from nine percent of the range of scores (1.64 points) for the difference between the mean score of denied cannabis users versus those with cannabis use histories on the NM-SAAS, to 17% of the range of scores (4.55 points) for the difference between the mean score of denied cannabis users versus those with histories of cannabis use on the P-SAAS. Whether the magnitude of these differences may have any meaningful bearing on clinical judgment or patient care will be explored to some

extent later in this chapter.

### **Hypothesis 3**

Hypothesis 3 examined the relationship between perceptions of cannabis use risks and attitudes toward substance use among doctoral psychology trainees. Results indicated that psychology trainees who associated cannabis use with greater risk also tended to be less permissive of substance use and more likely to hold stereotypical beliefs related to substance use and substance users, though perceptions of cannabis' risks were unrelated to the belief that substance use is morally evil or wrong.

Although the correlational analyses utilized prevent causal inferences from being drawn, the associations between scores on the PCURQ and P-SAAS, as well as the PCURQ and NS-SAAS are notable, as they suggest that doctoral psychology trainees' beliefs about the psychological and physical health risks associated with cannabis use are linked in some manner to their value judgments of substance users, including both (a) whether the trainees believe that substance use at some level exists on a continuum of normal human behavior (or conversely, whether all substance use is pathological), and (b) whether the trainees make assumptions about individuals' substance use based on their physical appearance and other common stereotypes. The implications of this finding should raise concern among mental healthcare professionals: On one hand, these findings suggest that individuals who hold liberal attitudes toward substance use may underestimate the risks associated with their clients' cannabis use, and could in turn fail to provide sufficient psychoeducation or other interventions to cannabis users in treatment. On the other hand, and equally concerning, these findings may indicate that individuals who do associate cannabis use with physical and psychological risk may hold stigmatizing attitudes toward substance users that might harm the relationship between clinician and patient in ways

that prevent the provision and receipt of effective treatment. The link between personal beliefs about substance use/users and acknowledgement of the risks associated with cannabis use among clinicians in training is a concerning one, as it suggests that subjective opinions may be tied to perceptions about the medical risks associated with cannabis use. More optimistic is the lack of significant association between scores on the PCURQ and NM-SAAS, which suggests that doctoral psychology trainees' beliefs about the risks of cannabis use are unrelated to their belief that individuals who use substances are morally corrupt.

#### **Hypothesis 4**

While the findings of the previous three hypotheses arguably have implications for clinical practice, Hypothesis 4 – which posited that doctoral psychology trainees' perceptions of cannabis use's risks, attitudes toward substance use, and cannabis use histories would predict participants' diagnoses of cannabis use disorder in a hypothetical client portrayed in a vignette – is the sole hypothesis which directly examined the impact of trainees' personal beliefs and behavior on the provision of clinical services, namely diagnostic assessment.

A series of three hierarchical logistic models resulted in the following conclusions: (a) none of the attitudes examined in the current study – including permissiveness toward substance use, non-stereotyping toward substance use, non-moralizing toward substance use, and perceptions of the risks of cannabis use – were predictive of participants' diagnostic decisions; and (b) current cannabis use – but not past cannabis use – significantly predicted accurate diagnosis of cannabis use disorder in the presented vignette. Additionally, results of two post-hoc analyses indicated that while graduate training in substance use disorders was not, in and of itself, a significant predictor of diagnostic accuracy, it may modify the relationship between cannabis use history and diagnostic decision-making. Consideration will be given to each of

these findings below.

**Role of perceptions of cannabis' risks and attitudes toward substance use in the prediction of cannabis use disorder diagnosis.** In contrast to Hypothesis 4, none of the attitudes measured in the present study were found to predict participants' diagnostic decisions, whether accurate (operationally defined by diagnosis of the hypothetical client described in the vignette) or inaccurate (operationally defined as failure to diagnose the hypothetical client described). While these results contradicted the predictions initially proposed in the current study, failure to reject the null hypothesis is arguably a positive finding, as it suggests that neither personal beliefs about the risks of cannabis use, nor permissive, non-stereotyping, or non-moralistic attitudes toward substance use are significantly influencing trainees' diagnostic decisions.

While the findings of the current study suggest that trainees' beliefs about the risks of cannabis use (as defined by PCURQ scores), permissiveness (P-SAAS scores), non-moralism (NM-SAAS scores), and non-stereotyping (NS-SAAS scores) appear not to be significant predictors of diagnostic decision, the scope of such results is rather limited. It remains possible that attitudes not measured in the current study, or even variations of attitudes measured in the present study, may indeed influence doctoral psychology trainees' diagnostic decisions. Identifying what such attitudes may bias diagnostic decisions among trainees is a worthwhile undertaking. Given the possibility that an alternative attitude or set of attitudes may be predictive of trainees' diagnostic decisions, the current study is unable to conclusively state that trainees' personal attitudes and beliefs as a whole are unrelated to their diagnostic decisions.

**Role of current cannabis use in the prediction of cannabis use disorder diagnosis.**

Arguably the most surprising result of the current study is the finding that endorsement of

current cannabis use among doctoral psychology trainees increased the likelihood that trainees would accurately make a diagnosis of cannabis use disorder by 4.52 times. Further, rather than reduce the predictive ability of current cannabis use, when demographic variables were entered into the model as controls of perceptions of cannabis use's risks and attitudes toward substance use, current cannabis use became more predictive of accurate decision-making among trainees, with those endorsing current cannabis use now 51.03 times more likely to accurately diagnose cannabis use disorder. Certainly, such findings demonstrate that Festinger's (1957) Theory of Cognitive Dissonance fails to account for the mechanisms underlying diagnostic decision-making in doctoral psychology trainees.

The finding that individuals who have never used cannabis were significantly less likely to correctly diagnose cannabis use disorder is particularly striking in light of the number of diagnostic criteria required to make this diagnosis. In order to make a diagnosis of cannabis use disorder of mild severity (the lowest severity level at which a diagnosis can be made; American Psychiatric Association, 2013), a client must demonstrate two diagnostic criteria at minimum; however, review of the vignette indicates that the hypothetical client met criteria for moderate cannabis use disorder, meeting four criteria. Given the abundance of symptoms portrayed in the vignette – double the number required to make a positive diagnosis – it is notable that doctoral trainees with no history of cannabis use still demonstrated a consistent deficit in their identification of cannabis use disorder.

Notably, the results of the present study contradict the body of previous literature which has concluded that healthcare professionals' personal health-related behaviors – including cannabis use – appear to bias their clinical judgments of related behaviors in their patients (e.g., see Aalto & Seppa, 2007; Geirsson et al., 2009; Lock et al., 2002). Unfortunately, while the



current study is the first to suggest that doctoral psychology trainees' diagnoses of cannabis use disorder are predicted by whether or not they themselves endorse current cannabis use, the study offers little in the way of explaining why doctoral psychology trainees demonstrate this discrepancy. In lieu of data-driven explanations for the finding that current cannabis users are more likely to accurately diagnose cannabis use disorder, theoretical explanations for these findings warrant consideration. Several such theories are offered below.

*“Personal experience as professional advantage” hypothesis.* The current study initially hypothesized that doctoral psychology trainees may be biased by their personal substance use. This was in line with the extant literature on the impact of personal substance use on clinical judgment among healthcare professionals. However, the opposite notion – that mental health professionals' personal experiences may make them more adept clinicians – is also commonly discussed among psychotherapists and the writers and researchers who study psychotherapy; their work suggests that personal experience may enhance psychologists' and other mental health professionals' sensitivity to similar experiences among their patients. The argument that personal experience may be professionally advantageous is frequently found in writings on the concept of wounded healing, as well as multicultural psychology. The benefits of personal experience as discussed in both of these bodies of literature will be considered below.

Within the context of psychology, the term “wounded healer” is used to describe mental health professionals who have themselves faced adversity, typically in the form of personal mental illness, addiction, or trauma. The introduction of the concept to contemporary theories of psychotherapy is generally credited to Carl Jung, who wrote, referring to psychotherapists in his work *Memories, Dreams, Reflections*: “only the wounded physician heals,” (Jung, 1963, p. 134). As Jung's words speak to, wounded healers are theorized to possess unique characteristics that

may inform the process of psychotherapy and facilitate the therapeutic alliance.

Although the majority of research on the wounded healer paradigm has examined how personal experiences with mental illness inform vocational choice among mental health professionals (e.g., see Barnett, 2007; Farber, Manevich, Metzger, & Saypol, 2005), a smaller body of literature has investigated the benefits of woundedness on psychotherapeutic processes. As Zerubavel and O'Dougherty Wright (2012), in a recent review of wounded healer literature, write:

Commonly cited positive effects include a greater ability to empathize with clients, a deeper understanding of painful experiences, heightened appreciation for how difficult therapy can be, more patience and tolerance when progress is slow, and greater faith in the therapeutic process (Gelso & Hayes, 2007; Gilroy, Carroll, & Murra, 2001). Although the therapist's own wounds may be activated during psychotherapy sessions, they can potentially be used to promote self-healing within the client (Miller & Baldwin, 2000; Sedgwick, 2001). Research indicates that the wounded healer's countertransference can have a positive influence on therapy (Fauth, 2006; Gelso & Hayes, 2007; Sedgwick, 1994). Briere (1992) emphasizes that sufficiently recovered wounded healers may make uniquely talented therapists. (p. 483-484)

Of particular relevance to the current study, the concept of wounded healer as uniquely skilled practitioner is perhaps nowhere more popular than in the field of addiction. As White (2000a, 2000b) notes, individuals in recovery from alcohol or other substance use disorders have historically played critical roles in the development and operation of substance use disorder treatment programs, as well as self-help recovery organizations (e.g., Alcoholics' Anonymous); indeed, many practicing addiction treatment providers continue to come to the field by way of

their own recovery today. Speaking specifically of the theorized benefits of woundedness when treating addiction, White (2000b) notes that, among other things, individuals who have personally experienced addiction may benefit from “a knowledge of the physiology, psychology, and culture of addiction that is derived from direct experience,” (p. 17). Applying this logic to cannabis use, it is possible that individuals who have used cannabis themselves may be uniquely adept at identifying problem use, as they may be able to use their personal experiences of cannabis use as a barometer when assessing others’ use for evidence of addiction.

While the benefits of woundedness as described above have long been suggested, research to substantiate these claims is very limited (see Zerubavel and O’Dougherty Wright [2012] for an extensive consideration of barriers to dialogue and research on psychologists as wounded healers). A review of the research on woundedness suggests that what little research does exist typically utilizes survey and/or qualitative methodology, with studies exploring therapists’ own perceptions of the benefits of personal experience, rather than examining objective differences in the course and outcomes of treatment (e.g, see Gilroy, Carroll, & Murra, 2001). Those studies which do compare the therapy outcomes of “wounded” therapists to “unwounded” therapists are prone to their own methodological limitations, which prevent generalization. For example, studies comparing recovering addiction treatment providers to those without personal histories of addiction are typically confounded by the fact that therapists in recovery tend to have less education than those who are not in recovery, suggesting that any differences in efficacy of provided treatment may be attributable to level of education (Gelso & Hayes, 2007). Perhaps most importantly for the purposes of the current study, to the knowledge of the author, no studies have examined the impact of woundedness on diagnostic accuracy or clinical judgment; thus, it is unclear whether the benefits of woundedness described in the

literature are generalizable to the process of assessment and diagnosis.

While no studies to date have explored the impact of woundedness on diagnostic accuracy, clinician factors and their relationship to diagnostic accuracy and clinical judgment have been examined somewhat more within the multicultural psychology literature. A widely cited meta-analysis by López (1989) revealed evidence of biased diagnosis resulting in either under- or over-diagnosis of psychiatric disorders based on socioeconomic status, race, cognitive ability, and sex. Following López's (1989) work, a large-scale analogue study by Russell, Fujino, Sue, Cheung, and Snowden (1996) concluded that therapists who were racially/ethnically matched to clients judged these clients as having higher levels of functioning than non-matched therapists, suggesting that "therapists who are ethnically similar with their clients are better able to understand the behaviors and verbalizations of clients within an appropriate cultural context," (p. 612-13). Were one to think of cannabis use as a subculture, one might reasonably theorize that the same conclusions formulated by Russell et al. (1996) might apply to the cannabis users in the current study, such that the current users, having developed a sense of what constitutes "normal" versus "abnormal" cannabis use through personal experience, would correctly identify someone with cannabis use disorder as differing from the norms of the recreational, casual use cannabis "culture."

Although literature on wounded healers and therapist matching may shed some light on the findings for doctoral psychology trainees in the current study, these three groups – cannabis using psychology trainees, wounded healers, and culturally diverse therapists – have some notable differences which must be considered. For one, as Zerubavel and O'Dougherty Wright (2012) note in their discussion of woundedness, the concept of the wounded healer implies that the therapist has experienced distress from which he or she has "healed, or at least understood

and processed sufficiently,” (p. 482). Contrary to this definition, the majority of trainee participants in the current study – despite endorsing current illicit substance use – did not meet criteria for problem use, nor is it evident (due to study limitations) that the trainees have “processed sufficiently” their use. Indeed, drawing upon the wounded healer paradigm, one might be compelled to hypothesize that past cannabis users would have demonstrated superior diagnostic accuracy to current users and/or those without histories of cannabis use, given their history of cannabis use (providing a diagnostic “barometer,” as described earlier) coupled with current abstinence, which may reduce the potential bias that active use might elicit, as hypothesized based on cognitive dissonance theory. However, this was not the case. Similarly, although it is possible that one may consider their cannabis use an important part of their identity, particularly given the recent politicization of cannabis use, it would seem an oversimplification to liken the identity of cannabis user to components of identity such as race, ethnicity, or sex (indeed, were it the case that participants’ cannabis use played a critical role in their sense of self, this might reasonably be pointed to as an indicator of problem use). Nonetheless, in lieu of research or theory which directly addresses the findings of the present study, both the wounded healer literature and writings in multicultural psychology suggest potential explanations for the results obtained.

*Latent variable hypothesis.* While it is possible that current cannabis use in and of itself predicts diagnostic accuracy among doctoral psychology trainees – perhaps, as suggested above, because of increased sensitivity to problem cannabis use among current users – it may be the case that current cannabis use serves as a proxy for a latent variable not explicitly measured by the current study.

In an exploratory study such as the current project, it is impractical to identify and

examine all potential predictors of a given outcome; accordingly, the current study selected five variables (cannabis use history, and scores on the PCURQ, P-SAAS, NM-SAAS, and NS-SAAS) supported in the literature to examine as predictors of diagnostic judgment. Nonetheless, it is reasonable to suggest that other variables may influence diagnostic decision-making. For example, the present study gathered data on participants' cannabis use histories, but did not ask participants about other substances used, personal history of substance use disorder, or whether participants had family members or friends with addiction histories. It is possible that one of these variables, a combination of these variables, or perhaps variables yet to be identified might be present at a greater frequency in participants who report current cannabis use. For example, one could reasonably hypothesize that participants who themselves use cannabis may be more likely to have friends who have used cannabis or other substances, and in turn, more likely to have friends who have met criteria for substance use disorders, which might make current cannabis users more sensitive to indicators of problem substance use. Unfortunately, the current study lacks the data to support this theory. Further research on variables which may co-occur with current cannabis use among doctoral psychology trainees is warranted in order to identify alternate factors which may modify the relationship between current cannabis use and increased accuracy in diagnosis of cannabis use disorder.

*Minimizing bias hypothesis.* Thus far, the findings of the current study have been conceptualized as evidence of enhanced diagnostic ability among current cannabis users. However, it is possible that the inconsistency in diagnostic accuracy between current cannabis users and those who have never used cannabis may instead indicate impaired clinical judgment in those with no history of cannabis use.

What might lead individuals who deny personal history of cannabis use to fail to

correctly diagnose cannabis use disorder? Unlike doctoral psychology trainees who report current cannabis use, those who deny history of cannabis use have no clear personal incentive to minimize evidence of problem cannabis use in a client, as making a diagnosis of cannabis use disorder would not result in cognitive dissonance for this group of trainees.

Perhaps the answer to this question is good intentions. In his work on multicultural psychology and clinical bias, López (1989) – cited above in discussion of personal therapist characteristics which may be advantageous to clinical work – reported that clinicians may be prone to more than one type of bias:

Investigators in general have assumed that biased evaluations can only occur in one direction, toward the perception of greater disturbance. This assumption may have served as a barrier in finding bias in clinical judgment. In addition to overpathologizing actual symptoms, practitioners may also minimize symptoms of actual pathology; that is, they may judge actual symptoms as representing normative behavior, when in fact the symptoms represent abnormal behavior. Depressive symptomatology, for example, may be judged as normative behavior for mothers of young children (Ginsberg & Brown, 1982), and psychotic symptomatology may be judged as more normative for mentally retarded individuals than for individuals of normal intellectual functioning (Reiss, Levitan, & Szyszko, 1982). Borrowing from Chess, Clark, and Thomas (1953), López (1983b) referred to this type of bias as the minimizing bias. Few clinical investigators have acknowledged this bias in clinical judgment. In fact, evidence in support of the minimizing bias is sometimes interpreted as pro-Black or pro-woman findings and is not interpreted as possible error. (p. 186)

As Snowden (2003) writes in a review of the literature on clinical bias, minimizing bias is likely

“well-intentioned,” (p. 242); in a discipline which has historically pathologized women; racial and ethnic minorities; members of the lesbian, gay, bisexual and transgender (LGBT) community; and others members of non-privileged groups and classes, contemporary clinicians’ may be overly cautious when evaluating members of these groups. Although such minimization is arguably driven by a desire not to marginalize individuals by attributing normal distress and other lived experiences to pathology, such caution may, as López (1989) and Snowden (2003) have argued, have unintentional repercussions, including a failure to diagnose individuals who do meet criteria for mental disorders, resulting in an exacerbation of prevailing mental health treatment disparities in these communities.

In the current political and cultural landscape of which doctoral psychology trainees and their clients are a part, much has been made of the notion that recreational cannabis use has long been wrongly pathologized. As discussed at length in Chapter II of this dissertation, recent surveys have demonstrated that a majority of Americans have begun to dispute cannabis’ risks (e.g., see Galston & Dionne Jr., 2013; Pew Research Center, 2013). In this context, when faced with the task of diagnosing someone with cannabis use disorder, individuals who have never used cannabis might reasonably be influenced by minimizing bias. Fearful that diagnosing a recreational cannabis user with cannabis use disorder might be over-pathologization of normal behavior, these trainees may, to use López’s (1989) words, “judge actual symptoms as representing normative behavior, when in fact the symptoms represent abnormal behavior,” (p. 186). In contrast, current cannabis users would not interpret their decision to make a diagnosis of cannabis use disorder as over-pathologizing recreational cannabis use, as their personal experiences of cannabis use support the argument that recreational cannabis use can exist on a continuum of normal behavior.



As previously noted, the explanations offered for the finding that current cannabis use is predictive of correctly diagnosing cannabis use disorder are not supported with data from the present study. The interpretations which have been offered – including the “personal experience as professional advantage” hypothesis, latent variable hypothesis, and minimizing bias hypothesis – are all theoretical. Additional research examining these hypotheses is essential in verifying any of these theories, and to clarify the nature of the relationship between cannabis use and diagnostic decision-making among doctoral psychology trainees.

**Influence of Graduate Training in Substance Use Disorders.** After identifying current cannabis use as the only significant predictor of diagnostic decisions in a series of logistic regression analyses, training in substance use disorders was examined as a predictor in a series of post hoc analyses; as previously noted, these analyses revealed that although training in substance use disorders in and of itself was not a significant predictor of diagnostic decisions among trainees, when training was accounted for in the logistic model, the influence of current cannabis use as a predictor was unmasked. When the definition of substance use disorders training was limited to intensive training experiences (operationalized as endorsement of (a) training toward certification or completion of certification as a substance abuse counselor, and/or (b) externship, internship, or similar clinical training experiences in which substance use disorder treatment was a primary focus), this effect was magnified. The findings of these analyses are critical, as they suggest that training in substance use disorders may modify the relationship between diagnostic judgment and history of cannabis use; in other words, training in substance use disorders – particularly experiential training – either reduces the diagnostic advantage associated with current cannabis use, or increases non-current users’ diagnostic skill. Accordingly, by accounting for the variance associated with substance use disorder training,

current cannabis use became more predictive of diagnostic decisions.

It is unclear why substance use disorders training (non-intensive or intensive) is not in and of itself a predictor of diagnostic decision-making among doctoral psychology trainees. One possibility which has already been suggested is that unexamined variations of variables measured in the present study be stronger predictors of doctoral psychology trainees' diagnostic decisions than the variables selected. In line with this theory, although the present study requested information from participants regarding whether they had received certain forms of training in substance use disorder diagnosis and treatment, it did not assess participants' competence in these domains of clinical work. It remains possible that operationalizing training using measures of competency, rather than the more basic operationalization utilized in the present study (endorsed versus denied) may have yielded significant results.

### **Implications**

Although the present study is unable to explain the etiology of the discrepancy in diagnosing cannabis use disorder observed among trainees based on their personal history of cannabis use, that a discrepancy at all was observed should be cause for concern. Since the current study was initially proposed in May 2014, epidemiologists have reported that the prevalence of cannabis use in the United States has increased from 4.1% to 9.5% (based on a nationally representative sample of Americans; Hasin et al., 2015). Within the same time period, the prevalence of cannabis use disorder nearly doubled, increasing from 1.5% of the population to 2.9%, with nearly three in 10 cannabis users meeting criteria for cannabis use disorder in 2012-13, an increase which data suggest is attributable not to increased risk of developing cannabis use disorder among those already using cannabis (e.g., due to increasing potency of the cannabis crop), but simply to increased cannabis use in the population (Hasin et al., 2015).

Indeed, as predicted when the current study was initially proposed, Hasin and colleagues (2015) conclude, “the clear risk for marijuana use disorders among users (approximately 30%) suggests that as the number of US users grows, so will the number of those experiencing problems related to such use,” (p. 1240). Without question, if clinician factors, including personal cannabis use (or lack thereof, as the current study suggests) limit accurate identification of cannabis use disorder in even a portion of the nearly three percent of the United States population who meets criteria for cannabis use disorder, the potential impact on public health is substantial.

Thus far, the current study has emphasized that accurate identification of cannabis use disorder is important insofar as the expedient and accurate identification of any medical or psychiatric diagnosis is important: diagnosis leads to intervention, which in turn may reduce or prevent further deterioration of patients’ mental and physical health. Although treating cannabis use disorder and the direct impact it has on those individuals affected by it is, in and of itself, a sufficient rationale for the current study’s interest in identifying barriers to its diagnosis, there are indeed many other reasons that the accurate identification of cannabis use disorder matters; addiction does not occur in a vacuum, and undiagnosed and/or untreated substance use disorders have wide-ranging public health implications. As Hasin et al. (2015) note in their review of this literature, “use or early use of marijuana is associated with increased risk for many outcomes,” (p. 1236). Recent research (as cited by Hasin et al., 2015) has shown associations between cannabis use and reduced educational attainment (Lynskey & Hall, 2000); unemployment (Compton, Gfroerer, Conway, & Finger, 2014); adverse cognitive and neuropsychological outcomes (Meier et al., 2012); reduced quality of life (Lev-Ran et al., 2012); substance-related motor vehicle accidents (Brady & Li, 2014; Hartman & Huestis, 2013; Lenné et al., 2010; Ramaekers, Berghaus, van Laar, & Drummer, 2004); emergency room visits (SAMHSA, 2013a);

psychosis liability (Davis, Compton, Wang, Levin, & Blanco, 2013; Di Forti et al., 2015); comorbid psychiatric disorders, including personality disorders (Stinson, Ruan, Pickering, & Grand, 2006); and progression to other illegal substance use (Secades-Villa, Garcia-Rodriguez, Jin, Wang, & Blanco, 2015). Accordingly, failure to diagnose cannabis use disorder and engage clients in treatment has implications not only for those individuals, but for their families and communities; for healthcare systems; for local, state, and federal governments which designate funding for emergency services, public assistance, and health insurance programs; and for a range of other systems of which those individuals impacted by cannabis use disorder are inherently a part as members of society.

Although the accurate diagnosis of cannabis use disorder is a critical step involved in helping those with cannabis use disorder access treatment, it is ultimately only one of many processes involved in the treatment of problem cannabis use. While the attitudinal variables explored in the current study – permissiveness, non-stereotyping, non-moralizing, and perceptions of cannabis’ risks – were not significant predictors of clinical judgment in the present study, statistically significant differences in attitudinal variables among doctoral psychology trainees based on trainees’ cannabis use histories may have impacts on other clinical behaviors. As described in Chapter II, the work of Charuvastra and colleagues (2005) has previously suggested that physicians who held more non-moralistic and permissive attitudes toward substance use were more likely to support the legalization of medical cannabis, a finding which suggests, as the study’s authors write, “that personal attitudes regarding substance use might influence physicians’ views,” (p. 91). Likewise, the work of Norberg et al. (2012, also reviewed in Chapter II of the current dissertation) found that nurses and physicians who believed that cannabis should not be available for medical use were significantly more likely to report that

they had screened someone for cannabis use disorder in the past month than study participants who supported the legalization of medical cannabis, suggesting that healthcare professionals' personal beliefs about cannabis impact their provision of services to patients. Although the current study focused on the impact of personal beliefs about substance use on diagnostic decisions specifically, it is possible that trainees' attitudes about substance use and perceptions of cannabis' risks might influence other critical components of treatment such as referral to specialty substance use treatment services and provision of motivational interviewing interventions to individuals who evidence problem cannabis use. Clinician stigma toward substance use – as evidenced by endorsement of stereotypical or moralistic beliefs on the NM-SAAS and NS-SAAS – may also have deleterious impacts on the course of treatment for cannabis users, as such biases would be expected to harm the development of therapeutic alliance between provider and client, a factor which has repeatedly been demonstrated to play a key role in studies of psychotherapy efficacy (Horvath, Del Ray, Flückiger, and Symonds, 2011). Having discovered that psychology trainees' attitudes toward substance use and perceptions of cannabis' risks vary with their personal cannabis use histories, future research evaluating the practical significance of these group differences – specifically, whether such differences have implications for clinical practice – is called for.

In addition to the impact that attitudes toward substance use and perceptions of cannabis' risks may have on the treatment of cannabis use disorder, research published since the current study was initially proposed suggests that cannabis use in general (in other words, use which does not necessarily meet criteria for cannabis use disorder), may have implications for the treatment of other psychiatric diagnoses. A 2015 study by Wilkinson, Stefanovics, and Rosenheck based on data from 2, 276 veterans in posttraumatic stress disorder (PTSD) treatment

between 1992 and 2011 found that cannabis use was associated with worse symptom severity and treatment outcomes, as well as violent behavior. The results of this study suggest that cannabis use may, as the authors write, “worsen PTSD symptoms or nullify the benefits of specialized, intensive treatment,” (p. 1179). Although the current study did not examine the impact of trainees’ attitudes on assessment of non-disordered cannabis use, Wilkinson et al.’s (2015) findings highlight the possibility that cannabis use may have a significant influence on the presentation of other psychiatric disorders, and on the efficacy of standard psychotherapeutic treatments for these disorders. Were trainees’ personal beliefs about the risks associated with cannabis use or permissiveness toward substance use to bias professional judgments regarding the safety and/or efficacy of cannabis use for individuals with other mental health concerns – resulting, for example, in failure to address cannabis use with patients being evaluated for PTSD treatment – the time- and cost-intensive treatments psychologists provide might be in vain, and cannabis-using recipients of these treatments might ultimately not receive adequate care.

Finally, although this section has thus far emphasized the implications of the current study’s findings, given the nature of these findings it is equally important to address conclusions which should not be drawn from the reported results. Although the present study suggests that current cannabis users may be more accurate in their assessment of cannabis use disorder, such data should not be misinterpreted as an endorsement of cannabis use for doctoral psychology trainees. Cannabis remains an illegal substance under federal law, and recreational cannabis use remains illegal in most states (“State marijuana laws map,” 2015). Additionally, doctoral psychology trainees are not immune to the risks of cannabis use identified in the general population. The personal and professional consequences of illicit substance use certainly outweigh the possible benefit to diagnostic decision-making evidenced in the current study;

indeed, chronic, recreational cannabis use may have adverse consequences for other areas of clinical practice, though these were not examined in the present study. Further, as this chapter has suggested, it is likely that cannabis use may serve as a proxy for a latent variable not measured in the current study which might better explain improved diagnostic accuracy among current cannabis users, and which may be able to be developed through targeted graduate training experiences, as suggested by the study's findings on the impact of substance use disorder training. Although the current study suggests that many doctoral psychology trainees may choose to use cannabis during their training – a decision which warrants the attention of researchers and graduate training programs to the extent that this decision may have implications for trainees' clinical work – the current study should not be viewed as an endorsement of cannabis use.

### **Strengths and Limitations**

As previously described, the most notable strength of the current study is that it is the first known to examine the influence of doctoral psychology trainees' personal cannabis use, beliefs about the risks of cannabis use, and attitudes toward substance use on diagnosis of cannabis use disorder. Despite the fact that diagnosis is a core competency for psychologists in clinical settings, to date, no studies have examined the impact of psychologists' or doctoral trainees' personal health-related behaviors or beliefs on clinical judgment, including diagnostic assessment. By exploring how the next generation of psychologists' personal cannabis use, perceptions of cannabis' risks, and attitudes toward substance use may impact their clinical judgment, the current study sought to identify factors which may promote or serve as barriers to accurate diagnosis of cannabis use disorder, a substance use disorder which is projected to become increasingly prevalent in the United States as cannabis use itself rises (Hasin et al.,

2015). While the current study was unable to definitively identify a variable or set of variables which predict correct versus incorrect diagnosis of cannabis use disorder with total accuracy, the finding that current cannabis use was a significant predictor of correct diagnosis of cannabis use disorder may be a crucial first step in identifying factors which are (a) associated with improved diagnostic accuracy among trainees, and (b) responsive to training, with the ultimate aim of increasing competency in the diagnosis of cannabis use disorder via targeted graduate training interventions.

Methodologically, the study has several strengths. As Heppner, Wampold, and Kivlighan (2008) report, analogue studies have several benefits, some of which the present study took advantage. For example, by utilizing a vignette devised specifically for the present study – as opposed to transcripts, audiotapes, or video of actual diagnostic interviews – the study was able to control for extraneous and confounding variables which may have threatened its internal validity. This is particularly important in the present study, as individuals with cannabis use disorder often meet criteria for co-occurring substance use and other psychiatric diagnoses (Stinson et al., 2006), which may have imposed unique diagnostic challenges for participants and increased the likelihood that participants' ultimate diagnostic decisions may have been influenced by factors outside of the scope of the present study. Additionally, by utilizing a vignette depicting a hypothetical client, the study was able to evaluate trainees' diagnostic abilities without risking violating the privacy of real-life clients.

One of the primary concerns when the initial study was proposed was that doctoral psychology trainees would be reluctant to report illicit substance use. To reduce participants' hesitation to participate in the study or honestly report their cannabis use, the current study employed anonymous, online-based data collection. While the current study relies on self-report



to measure history and recency of cannabis use (versus objective measures, e.g., urinalysis), and therefore cannot guarantee that participants were truthful in their reporting of cannabis use, it appears that that collecting data anonymously encouraged participants to report their cannabis use candidly, with approximately two-thirds of the current sample endorsing lifetime cannabis use. Although it is possible that endorsing cannabis use is not viewed as a liability by current doctoral psychology trainees, prior studies of healthcare professionals have indicated that this group may underreport cannabis use due to potential professional and legal repercussions (Norberg et al., 2012); accordingly, it is reasonable to conclude that collecting data anonymously increased participants' willingness to be forthcoming in their responses. Given the success of this study's recruitment and data collection procedures, future researchers examining substance use among healthcare professionals and trainees may wish to consider employing the same methods utilized in the current study.

In spite of the study's strengths, it is not without its limitations. Although the current study benefits from the increased internal validity afforded by analogue methodology, this benefit may come at the expense of reduced external validity (Heppner et al., 2008). In other words, while crafting a vignette which depicted cannabis use disorder in the absence of any co-occurring diagnoses strengthens internal validity, this depiction is inherently contrived, potentially reducing the generalizability of study findings to real-world clinical assessment scenarios, in which diagnostic decision-making may be complicated by the fact that individuals with cannabis use disorder may have co-occurring disorders with confounding diagnostic criteria. Additionally, while use of anonymous data collection procedures may have increased participants' willingness to honestly describe their cannabis use, because data was collected anonymously, there is no way to ensure – however unlikely – that participants did not complete

the study more than once, or exit and restart the study to alter their responses once they realized the aims of the study. Accordingly, one might imagine a scenario in which a participant who had strong opinions about cannabis use exited the study upon realizing that the study was exploring the relationship between personal cannabis use and diagnostic judgments in order to change their answer to the question on diagnosis in such a way that would distort the findings relating cannabis use behavior to diagnosis of cannabis use disorder (although the odds of this scenario occurring seem highly unlikely). Similarly, although the study's use of convenience sampling undoubtedly increased the rate of data collection, as noted in Chapter I, the selected data collection method may limit the generalizability of study findings. It is possible that participants who chose to take part in the study self-selected into the study due to their interest in the description of the research, and that those who did not select to participate may differ in certain ways from those who do participate, in a manner which poses a threat to the validity of the results.

In addition to methodological limitations routinely associated with convenience sampling and anonymous data collection, the current study suffered from a lack of respondents whose responses on the CUPIT evidenced problem cannabis use. Of the 123 participants retained following data screening, only eight endorsed patterns of cannabis use resulting in positive CUPIT screens, compared to 36 current cannabis users whose scores on the CUPIT failed to suggest evidence of problem cannabis use. Although it is neither concerning nor surprising that few doctoral psychology trainees met criteria for problem cannabis use, it is possible that statistical analyses which compared individuals with negative screens to those with positive screens were underpowered, and as such were unable to detect hypothesized differences between these groups. Unfortunately, it was neither practical nor possible to gather additional data from

trainees who met criteria for problem cannabis use alone. If recruitment was reopened, many participants who inevitably would not have screened positive for problem cannabis use would have completed the survey, placing an undue burden on the population from which the study sampled. On the other hand, if alternative recruitment methods were implemented to request participation from only trainees who identified as current problem cannabis users, trainees who consented to participate may have selected into the study based on information which was not available to other participants making up the sample; such a change in procedure may ultimately have introduced confounding factors, posing a risk to study validity. In the end, it was felt that the ramifications of reopening data collection outweighed the benefits of increasing the sample of participants who screened positive for problem cannabis use, particularly as it is likely that this is an unusual phenomenon among individuals enrolled in demanding doctoral training programs.

There is little data on the psychometric properties of measures selected to assess trainees' attitudes in the current study – the P-SAAS, NM-SAAS, and NS-SAAS (Chappel et al., 1985), and PCURQ, an experimental questionnaire adapted from the work of Kondrad & Reid (2013); ultimately, these scales were selected based on their use in previous studies of beliefs about cannabis use and substance use among healthcare professionals. More psychometrically robust measures of healthcare professionals' attitudes toward substance use and beliefs about cannabis' risks – while desirable – remain elusive; accordingly, the use of these measures is considered a notable but unavoidable limitation of the present study.

The current study's primary aim was to test a specific hypothesis: that doctoral psychology trainees' histories of cannabis use would impair their diagnostic judgments when tasked with assessing for cannabis use disorder. As previously discussed, this hypothesis was

informed by Festinger's (1957) Theory of Cognitive Dissonance. As has been reported, the findings of the current study contradicted this hypothesis. Although these findings may have many interesting implications, limitations in study design prevent more specific conclusions from being drawn from the findings obtained. In their chapter on analogue methodology, Heppner and colleagues (2008) note that researchers can "achieve a higher degree of specificity in the operational definitions of a variable," (p. 411) by creating vignettes which represent varying levels of a variable of interest. The present study, which utilized one vignette shown to all participants, did not capitalize on this useful feature of analogue design; the need to include alternate vignettes was not foreseen, and would have required an exponential increase in sample size with the addition of each subsequent vignette. Had the results of the present study been consistent with the study's primary hypothesis, the outcome variable – correct diagnosis of cannabis use disorder based on the vignette, versus failure to make this diagnosis – would have provided sufficient evidence that trainees' personal cannabis use biased their clinical judgment. In lieu of this result, additional vignettes – e.g., a vignette depicting recreational cannabis use which did not meet criteria for cannabis use disorder – may have been helpful in establishing the nature of the difference between current cannabis users and past or denied cannabis users. Without the additional specificity afforded by the inclusion of additional vignettes (resulting in a larger range of potential outcomes), the current study is limited in its conclusions.

Finally, it is necessary to acknowledge the limitations inherent in exploratory research. As the present study was the first known to examine the influence of personal beliefs and behaviors on the diagnosis of cannabis use disorder among doctoral psychology trainees, study design was driven by theory and the findings of related research on healthcare professionals in other disciplines. Ultimately, the current study found that many of the variables which were

initially hypothesized to predict diagnosis of cannabis use disorder by doctoral psychology trainees were not significant predictors of diagnostic decisions. In light of the finding that current cannabis use among trainees predicted correct diagnosis of cannabis use disorder based on the vignette employed by the present study, it has been argued that it is likely that current cannabis use may be a proxy for a latent variable not measured in the present study. It is outside the scope of the current study – or any exploratory study – to examine every possible predictor of a given behavior, particularly a behavior as complex as diagnostic decision-making; thus, the current study was unable to definitively determine the factor(s) which predict accurate diagnosis of cannabis use disorder. Nonetheless, the current study is believed to provide critical initial data which may inform the development of subsequent research aimed at identifying predictors of diagnostic decision-making which have yet to be identified.

#### **Future Directions for Research**

The findings of the current, exploratory study have laid the groundwork for a number of additional studies. As previously noted, the current study found that doctoral psychology trainees' beliefs about the risk of cannabis use and attitudes toward substance use varied by history and recency of personal cannabis use. Despite this, and contrary to study predictions, these attitudinal differences were not predictive of differences in diagnostic decisions among trainees. Although the attitudes measured in the current study did not predict diagnosis of cannabis use disorder, the observed differences in these attitudes may have an impact on provision of care in ways which were not explored in the present study. As noted above, diagnostic assessment is only one of many clinical behaviors involved in the treatment of substance use disorders, including cannabis use disorder. Studies exploring the implications of attitudinal differences on other clinician behaviors – i.e. provision of evidence-based

interventions (e.g., use of motivational interviewing) and referral to specialized substance use disorder treatment services – as well as core therapeutic processes, such as the development of therapeutic alliance, would both determine the practical significance of these observed discrepancies, as well as identify those attitudes which may impair the provision of these services and accordingly require remediation. Similar studies exploring the impact of trainees' personal cannabis use on the aforementioned clinical behaviors and therapeutic processes are also called for.

Additionally, as discussed throughout this chapter, the current study found that current cannabis use among doctoral psychology trainees predicted accurate identification of cannabis use disorder. It has been theorized that this finding indicates that current cannabis use may be beneficially linked to another factor which was unmeasured in the current study; for example, it has been posited that current use experiences may serve as a barometer when assessing others' use for evidence of addiction, resulting in increased sensitivity in the identification of cannabis use disorder. Alternatively, it has been suggested that current cannabis use may act as a proxy for a latent variable not explicitly measured in the current study. In contrast, whereas the aforementioned theories posit that current cannabis use is beneficial, the possibility remains that the diagnostic accuracy of current cannabis users is a benchmark, and past or denied cannabis use is associated with latent factors which impair diagnostic accuracy; for example, it has been hypothesized that individuals who do not currently use cannabis may minimize problem cannabis use when assessing cannabis use. Limitations of current study methodology limit the extent to which any of these theories can be verified; as such, future studies should seek to identify latent characteristics of current cannabis using trainees versus past or denied users which may account for the current study's findings.

In addition to clarifying the results of the present study, research targeted at identifying factors which either impair or enhance diagnostic accuracy in the identification of cannabis use disorder has important training implications. As noted in the “Implications” section of this chapter, the results of the current study should not be interpreted as an endorsement of cannabis use; however, it is apparent that individuals who endorsed current cannabis use were indeed more likely to correctly diagnose cannabis use disorder. Identifying latent predictors for which current cannabis use serves as a proxy (or, alternately, predictors of failure to diagnose cannabis use disorder, for which denied or past use are proxies) would ultimately serve as a foundation for the development of graduate training interventions which might enhance trainees’ identification of cannabis use disorder. Indeed, improving training is the ultimate aim of the present study; although the results of the current study shed light on factors which may influence accurate diagnosis of cannabis use disorder, this information is only valuable to the extent to which it can be utilized to improve doctoral psychology trainees’ competence in diagnosis and, in turn, increase diagnosis and subsequent access to care for clients with cannabis use disorders.

Although the current study explored factors which may influence doctoral psychology trainees’ diagnosis of cannabis use disorder, doctoral psychology trainees are only one group of healthcare providers tasked with diagnosing cannabis use disorder; accordingly, consideration should be given to replicating the current study with other healthcare professionals (and trainees in these fields), particularly licensed psychologists, psychiatrists, psychiatric social workers, substance abuse counselors, and mental health counselors, who are responsible for identifying and treating psychiatric disorders including substance use disorders.

Finally, as noted previously, there is little data on the psychometric properties of measures selected to assess trainees’ attitudes in the current study – the P-SAAS, NM-SAAS,

and NS-SAAS (Chappel et al., 1985), and the PCURQ (adapted from Kondrad & Reid, 2013). In light of the limitations of available measures, it is imperative that new or revised instruments be developed, ideally in advance of any further research exploring attitudes toward cannabis use among mental health professionals. Developing validated measures which capture contemporary beliefs about cannabis use and substance use generally will enable researchers to more accurately explore the influence of clinician attitudes on an array of clinical behaviors, including but not limited to diagnosis of cannabis use disorder.

### **Conclusions**

The incidence of cannabis use disorder is increasing across the United States as a function of Americans' increased cannabis use (Hasin et al., 2015). As such, it is critical that mental healthcare professionals – particularly the next generation of mental healthcare professionals, who may continue to witness increasing rates of cannabis use disorder – be able to accurately identify problem cannabis use. In keeping with this imperative, the current study was devised to explore potential barriers to diagnosing cannabis use disorder among one such group of future mental healthcare professionals, doctoral psychology trainees. The goal of the current study was twofold: First, the study examined whether doctoral psychology trainees' personal cannabis use predicted their perceptions of the risks of cannabis use and attitudes toward substance use. Second, the study sought to explore whether doctoral psychology trainees' personal cannabis use histories, perceptions of cannabis' risks, and attitudes toward substance use predicted whether they would correctly diagnose cannabis use disorder. Generally, results suggested that trainees' beliefs about the risks of cannabis use, as well as their permissiveness, stereotyping, and moralism toward substance use, varied with history and recency of personal cannabis use, suggesting that trainees' personal behaviors may bias attitudes which may have



some bearing on clinical judgment. Despite this, the study found that none of the attitudinal factors explored significantly predicted diagnostic decisions among trainees. Perhaps most surprisingly, findings suggest that endorsement of current cannabis use among doctoral psychology trainees increased the likelihood that trainees would accurately make a diagnosis of cannabis use disorder, contrary to study predictions. While it is apparent that diagnostic decisions are complexly determined in ways in which the current study – an exploratory effort – was ultimately unable to fully capture, the study nonetheless represents a crucial first step toward identifying those personal characteristics of doctoral psychology trainees which predict whether or not they will correctly identify and diagnose cannabis use disorder. The results of the present study have numerous implications for graduate training, clinical practice, and public health, and serve as a foundation for future studies to continue to identify those factors which may influence clinical judgment, and ultimately, to develop and test the efficacy of curriculum which may remediate barriers to accurate and efficient diagnosis of cannabis use disorder.

## References

- Aalto, M., & Seppa, K. (2007). Primary health care physicians' definitions on when to advise a patient about weekly and binge drinking. *Addictive Behaviors*, 32, 1321-1330.  
<http://dx.doi.org/10.1016/j.addbeh.2006.09.003>
- Aanavi, M.P., Taube, D.O., Ja, D.Y., & Duran, E.F. (1999). The status of psychologists' training about and treatment of substance-abusing clients. *Journal of Psychoactive Drugs*, 31, 441-444. <http://dx.doi.org/10.1080/02791072.1999.10471774>
- Aboyans, V., Pinet, P., Lacroix, P., & Laskar, M. (2009). Knowledge and management of smoking-cessation strategies among cardiologists in France: A nationwide survey. *Archives of Cardiovascular Disease*, 102, 193-199.  
<http://dx.doi.org/10.1016/j.acvd.2009.01.005>
- Abramson, S., Stein, J., Schaufele, M., Frates, E., & Rogan, S. (2000). Personal exercise habits and counseling practices of primary care physicians: A national survey. *Clinical Journal of Sport Medicine*, 10, 40-48. <http://dx.doi.org/10.1097/00042752-200001000-00008>
- Agresti, A. (2007). *Introduction to categorical data analysis*. Hoboken, NJ: Wiley.
- Al-Doghether, M., Al-Tuwikri, A., & Khan, A. (2007). Obstacles to preventive intervention. Do physicians' health habits and mind-set towards preventive care play any role? *Saudi Medical Journal*, 28, 1269-1274. Retrieved from <http://www.smj.org.sa/index.php/smj>
- Alexander, D. (2003). Clinical pilot experiences using the Marijuana Screening Inventory (MSI-X): Screening guidelines and case illustrations. *Journal of Social Work Practice in the Addictions*, 3, 29-51. [http://dx.doi.org/10.1300/j160v03n04\\_03](http://dx.doi.org/10.1300/j160v03n04_03)
- Allport, G.W. (1935). Attitudes. In C. Murchison (Ed.), *Handbook of social psychology* (pp. 798-844). Worcester, Mass: Clark University Press.

- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4<sup>th</sup> ed.). Washington, DC: Author.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5<sup>th</sup> ed.). Arlington, VA: American Psychiatric Publishing.
- American Psychological Association. (2010). Ethical principles of psychologists and code of conduct. Retrieved from <http://www.apa.org/ethics/code/index.aspx>
- Anthony, J.C. (2006). The epidemiology of cannabis dependence. In R.A. Roffman & R.S. Stephens (Eds.), *Cannabis dependence: Its nature, consequences and treatment* (pp. 58-105). Cambridge, UK: Cambridge University Press.
- Anthony, J.C., Warner, L.A., & Kessler, R.C. (1994). Comparative epidemiology of dependence on tobacco, alcohol, controlled substances, and inhalants: Basic findings from the National Comorbidity Survey. *Experimental and Clinical Psychopharmacology*, 2, 244-268. <http://dx.doi.org/10.1037/1064-1297.2.3.244>
- Barengo, N.C., Sandstrom, H.P., Jormanainen, V.J., & Myllykangas, M.T. (2005). Attitudes and behaviours in smoking cessation among general practitioners in Finland 2001. *Soz Praventimed*, 50, 355-360. <http://dx.doi.org/10.1007/s00038-005-4097-z>
- Barnett, M. (2007). What brings you here? An exploration of the unconscious motivations of those who choose to train and work as psychotherapists and counselors. *Psychodynamic Practice*, 13, 257-274. <http://dx.doi.org/10.1080/14753630701455796>
- Bashford, J., Flett, R., & Copeland, J. (2010). The Cannabis Use Problems Identification Test (CUPIT): Development, reliability, concurrent and predictive validity among adolescents and adults. *Addiction*, 105, 615-625. <http://dx.doi.org/10.1111/j.1360-0443.2009.02859.x>
- Behbehani, N.N., Hamadeh, R.R., & Macklai, N.S. (2004). Knowledge of and attitudes toward

- tobacco control among smoking and non-smoking physicians in 2 Gulf Arab states. *Saudi Medical Journal*, 25, 585-591. Retrieved from <http://www.smj.org.sa/index.php/smj>
- Bem, D.J. (1970). *Beliefs, attitudes, and human affairs*. Belmont, CA: Brooks/Cole.
- Brady, J.E., & Li, G. (2014). Trends in alcohol and other drugs detected in fatally injured drivers in the United States, 1999-2010. *American Journal of Epidemiology*, 179, 692-99.  
<http://dx.doi.org/10.1093/aje/kwt327>
- Brotons, C., Björkelund, C., Bulc, M., Ciurana, R., Godycki-Cwirko, M., Jurgoa, E., ... Vuchak, J. (2005). Prevention and health promotion in clinical practice: The views of general practitioners in Europe. *Preventive Medicine*, 40, 595-601.  
<http://dx.doi.org/10.1016/j.ypmed.2004.07.020>
- Bush, K., Kihlavan, D. R., McConell, M.B., Fihn, S.D., & Bradley, K.A. (1998). The AUDIT alcohol consumption questions (AUDIT-C): An effective brief screening test for problem drinking. *Archives of Internal Medicine*, 158, 1789-1795.  
<http://dx.doi.org/10.1001/archinte.158.16.1789>
- Cerdá, M., Wall, M., Keyes, K.M., Galea, S., & Hasin, D. (2012). Medical marijuana laws in 50 states: Investigating the relationship between state legalization of medical marijuana and marijuana use, abuse, and dependence. *Drug and Alcohol Dependence*, 120, 22-27.  
<http://dx.doi.org/10.1016/j.drugalcdep.2011.06.011>
- Chappel, J.N., Veach, T.L., & Krug, R.S. (1985). The Substance Abuse Attitude Survey: An instrument for measuring attitudes. *Journal of Studies on Alcohol*, 46, 48-52.  
<http://dx.doi.org/10.15288/jsa.1985.46.48>
- Charuvastra, A., Friedmann, P.D., & Stein, M.D. (2005). Physician attitudes regarding the prescription of medical marijuana. *Journal of Addictive Diseases*, 24, 87-93.

[http://dx.doi.org/10.1300/j069v24n03\\_07](http://dx.doi.org/10.1300/j069v24n03_07)

- Chiert, T., Gold, S.N., & Taylor, J. (1994). Substance abuse training in APA-accredited doctoral programs in clinical psychology: A survey. *Professional Psychology: Research and Practice*, 25, 80-84. <http://dx.doi.org/10.1037/0735-7028.25.1.80>
- Cole, J.M. (2013, August 29). *Memorandum for all United States attorneys: Guidance regarding marijuana enforcement*. [Memorandum]. Retrieved from [http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCYQFjAA&url=http%3A%2F%2Fwww.justice.gov%2Fiso%2Fopa%2Fresources%2F3052013829132756857467.pdf&ei=wGBIU9GfLMrOsASkxYCoBQ&usg=AFQjCNHcgeBSr72NLdUcTGl\\_KQmZyX07Lw&bvm=bv.65788261,d.cWc](http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCYQFjAA&url=http%3A%2F%2Fwww.justice.gov%2Fiso%2Fopa%2Fresources%2F3052013829132756857467.pdf&ei=wGBIU9GfLMrOsASkxYCoBQ&usg=AFQjCNHcgeBSr72NLdUcTGl_KQmZyX07Lw&bvm=bv.65788261,d.cWc)
- Compton, W.M., Gfroerer, J., Conway, K.P., & Finger M.S. (2014). Unemployment and substance outcomes in the United States 2002-2010. *Drug and Alcohol Dependence*, 142, 350-53. <http://dx.doi.org/10.1016/j.drugalcdep.2014.06.012>
- Cooke, R., & Sheeran, P. (2004). Moderation of cognition-intention and cognition-behaviour relations: A meta-analysis of properties of variables from the theory of planned behavior. *British Journal of Social Psychology*, 43, 159-186. <http://dx.doi.org/10.1348/0144666041501688>
- Copeland, M.G., Gilmour, S., Gates, P., & Swift, W. (2005). The Cannabis Problems Questionnaire: Factor structure, reliability and validity. *Drug and Alcohol Dependence*, 80, 313-319. <http://dx.doi.org/10.1016/j.drugalcdep.2005.04.009>
- da Silva Cardoso, E., Pruet, S.R., Chan, F., & Tansey, T.N. (2006). Substance abuse assessment and treatment: The current training and practice of APA Division 22 members. *Rehabilitation Psychology*, 51, 175-178. <http://dx.doi.org/10.1037/0090-5550.51.2.175>

- Darke, S. (1998). Self-report among injecting drug users: A review. *Drug and Alcohol Dependence*, 51, 253-263. [http://dx.doi.org/10.1016/s0376-8716\(98\)00028-3](http://dx.doi.org/10.1016/s0376-8716(98)00028-3)
- Davis, G.P., Compton, M.T., Wang, S., Levin, F.R., & Blanco, C. (2013). Association between cannabis use, psychosis, and schizotypal personality disorder: Findings from the National Epidemiologic Survey on Alcohol and Related Conditions. *Schizophrenia Research*, 15, 197-202. <http://dx.doi.org/10.1016/j.schres.2013.10.018>
- Dennis, M., Babor, T., Roebuck, M.C., & Donaldson, J. (2002). Changing the focus: The case for recognizing and treating cannabis use disorders. *Addiction*, 97 (Supplement 1), 4-15. <http://dx.doi.org/10.1046/j.1360-0443.97.s01.10.x>
- Dickinson, C. (2011, July 6). Marijuana shops outnumber Starbucks in Denver. *The Wire*. Retrieved from <http://www.thewire.com/business/2011/07/marijuana-shops-outnumber-starbucks-denver/39649/>
- Di Forti, M., Marconi, A., Carra, E., Fraietta, S., Trotta, A., Bonomo, M., ... Lynskey, M. (2015). Proportion of patients in south London with first-episode psychosis attributable to use of high potency cannabis: A case-control study. *Lancet Psychiatry*, 2, 233-8. [http://dx.doi.org/10.1016/s2215-0366\(14\)00117-5](http://dx.doi.org/10.1016/s2215-0366(14)00117-5)
- Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes*. Fort Worth, TX: Harcourt Brace Jovanovich.
- Earlywine, M. (2002). *Understanding marijuana: A new look at the scientific evidence*. New York: Oxford University Press.
- Farber, B. A., Manevich, I., Metzger, J., & Saypol, E. (2005). Choosing psychotherapy as a career: Why did we cross that road? *Journal of Clinical Psychology/In Session*, 61, 1009–31. <http://dx.doi.org/10.1002/jclp.20174>

- Faul, F., Erdfelder, E., Buchner, A., & Lang, A.G. (2009). Statistical power analyses using G\*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, 41, 1149-1160. <http://dx.doi.org/10.3758/brm.41.4.1149>
- Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford, CA: Stanford University Press.
- Frank, E., Bhat Schelbert, K., & Elon, L. (2003). Exercise counseling and personal exercise habits of US women physicians. *Journal of the American Medical Women's Association*, 58, 178-184. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed>
- Frank, E., Brogan, D., Mokdad, A.H., Simoes, E., Kahn, H.S., & Greenberg, R.S. (1998). Health-related behaviors of women physicians vs. other women in the United States. *Archives of Internal Medicine*, 158, 342-348. <http://dx.doi.org/10.1001/archinte.158.4.342>
- Frank, E., Carrera, J.S., Elon, L., & Hertzberg, V.S. (2007). Predictors of US medical students' prevention counseling practices. *Preventive Medicine*, 44, 76-81. <http://dx.doi.org/10.1016/j.yjpm.2006.07.018>
- Frost-Pineda, K., VanSusteren, T., & Gold, M.S. (2004). Are physicians and medical students prepared to educate patients about alcohol consumption? *Journal of Addictive Diseases*, 23, 1-13. [http://dx.doi.org/10.1300/j069v23n02\\_01](http://dx.doi.org/10.1300/j069v23n02_01)
- Galston, W.A., & Dionne, E.J., Jr. (2013, May). *The new politics of marijuana legalization: Why opinion is changing*. Washington, D.C.: Brookings Institute.
- Geirsson, M., Hensing, G., & Spak, F. (2009). Does gender matter? A vignette study of general practitioners' management skills in handling patients with alcohol-related problems. *Alcohol and Alcoholism*, 44, 620-625. <http://dx.doi.org/10.1093/alcalc/agg071>
- Gelso, C. J., & Hayes, J. A. (2007). *Countertransference and the Therapist's Inner Experience:*

- Perils and Possibilities*. Mahwah, NJ: Erlbaum.
- Gilroy, P. J., Carroll, L., & Murra, J. (2001). Does depression affect clinical practice? A survey of women psychotherapists. *Women & Therapy, 23*, 13–30.  
[http://dx.doi.org/10.1300/j015v23n04\\_02](http://dx.doi.org/10.1300/j015v23n04_02)
- Glasman, L.R., & Albarracín, D. (2006). Forming attitudes that predict future behavior: A meta-analysis of the attitude-behavior relation. *Psychological Bulletin, 132*, 778-822.  
<http://dx.doi.org/10.1037/0033-2909.132.5.778>
- Gorman, D.M., & Huber, C., Jr. (2007). Do medical cannabis laws encourage cannabis use? *International Journal of Drug Policy, 18*, 160-167.  
<http://dx.doi.org/10.1016/j.drugpo.2006.10.001>
- Gunes, G., Karaoglu, L., Genc, M.F., Pehlivan, E., & Egri, M. (2005). University hospital physicians' attitudes and practices for smoking cessation counseling in Malatya, Turkey. *Patient Education and Counseling, 56*, 147-153.  
<http://dx.doi.org/10.1016/j.pec.2004.02.002>
- Hall, S., Vogt, F., & Marteau, T.M. (2005). A short report: Survey of practice nurses' attitudes toward giving smoking cessation advice. *Family Practice, 22*, 614-616.  
<http://dx.doi.org/10.1093/fampra/cmi082>
- Hall, W., & Pacula, R.L. (2003). *Cannabis use and dependence: Public health and public policy*. Melbourne, Australia: Cambridge University Press.
- Halpern, M.T. (1994). Effect of smoking characteristics on cognitive dissonance in current and former smokers. *Addictive Behaviors, 19*, 209-217. [http://dx.doi.org/10.1016/0306-4603\(94\)90044-2](http://dx.doi.org/10.1016/0306-4603(94)90044-2)
- Harper, S., Strumpf, E.C., & Kaufman, J.S. (2012). Do medical marijuana laws increase



- marijuana use? Replication study and extension. *Annals of Epidemiology*, 22, 207-212.  
<http://dx.doi.org/10.1016/j.annepidem.2011.12.002>
- Hartman, R.L., & Huestis, M.A. (2013). Cannabis effects on driving skills. *Clinical Chemistry*, 59, 478-92. <http://dx.doi.org/10.1373/clinchem.2012.194381>
- Hasin, D.S., Saha, T.D., Kerridge, B.T., Goldstein, R.B., Chou, P., Zhang, H., ... Grant, B.F. (2015). Prevalence of marijuana use disorders in the United States between 2001-2002 and 2012-2013. *JAMA Psychiatry*, 72, 1235-42.  
<http://dx.doi.org/10.1001/jamapsychiatry.2015.1858>
- Healy, J. (2012, November 7). Voters ease marijuana laws in 2 states, but legal questions remain. *The New York Times*. Retrieved from  
[http://www.nytimes.com/2012/11/08/us/politics/marijuana-laws-eased-in-colorado-and-washington.html?\\_r=0](http://www.nytimes.com/2012/11/08/us/politics/marijuana-laws-eased-in-colorado-and-washington.html?_r=0)
- Heath, J., Andrews, J., Kelley, F.J., & Sorrell, J. (2004). Caught in the middle: Experiences of tobacco-dependent nurse practitioners. *Journal of the American Academy of Nurse Practitioners*, 16, 396-401. <http://dx.doi.org/10.1111/j.1745-7599.2004.tb00389.x>
- Heppner, P.P, Wampold, B. E., & Kivlighan, D. M., Jr. (2008). *Research design in counseling* (3<sup>rd</sup> ed.). Belmont, CA: Thomson Brooks/Cole.
- Hoaglin, D. C., & Iglewicz, B. (1987), Fine tuning some resistant rules for outlier labeling. *Journal of American Statistical Association*, 82, 1147-1149.  
<http://dx.doi.org/10.1080/01621459.1987.10478551>
- Hogg, M., & Vaughan, G. (2005). *Social Psychology (4th ed.)*. London: Prentice-Hall.
- Horvath, A. O., Del Re, A. C., Fluckiger, C., & Symonds, D. (2011). Alliance in individual psychotherapy. *Psychotherapy Special Issue: Evidence-based Psychotherapy*

- Relationships*, 48, 9-16. <http://dx.doi.org/10.1037/a0022186>
- Hosmer, D.W., Lemeshow, S., & Sturdivant, R.X. (2013). *Applied Logistic Regression* (3<sup>rd</sup> ed.). Hoboken, NJ: Wiley.
- Johnson, T.P., Booth, A.L., & Johnson, P. (2005). Physician beliefs about substance misuse and its treatment: Findings from a U.S. survey of primary care practitioners. *Substance Use & Misuse*, 40, 1071-1084. <http://dx.doi.org/10.1081/ja-200030800>
- Jung, C. G. (1963). *Memories, Dreams, Reflections*. New York, NY: Pantheon Books.
- Kawahara, K., Ohida, T., Osaki, Y., Mochizuki, Y., Minowa, M., Yamaguchi, N., & Kusaka, Y. (2000). Study of the smoking behavior of medical doctors in Fukui, Japan and their antismoking measures. *Journal of Epidemiology*, 10, 157-162. <http://dx.doi.org/10.2188/jea.10.157>
- Khatapoush, S., & Hallfors, D. (2004). 'Sending the wrong message': Did medical marijuana legalization in California change attitudes about and use of marijuana. *Journal of Drug Issues*, 34, 751-770. <http://dx.doi.org/10.1177/002204260403400402>
- Kondrad, E., & Reid, A. (2013). Colorado family physicians' attitudes toward medical marijuana. *Journal of the American Board of Family Medicine*, 26, 52-60. <http://dx.doi.org/10.3122/jabfm.2013.01.120089>
- Kraus, S.J. (1995). Attitudes and the prediction of behavior: A meta-analysis of the empirical literature. *Personality and Social Psychology Bulletin*, 21, 58-75. <http://dx.doi.org/10.1177/0146167295211007>
- Krech, D., & Crutchfield, R.S. (1948). *Theory and problems of social psychology*. New York: MacGraw-Hill.
- Lenné, M.G., Dietze, P.M., Triggs, T.J., Walmsley, S., Murphy, B., & Redman, J.R. (2010). The

- effects of cannabis and alcohol on simulated arterial driving: Influences of driving experience and task demand. *Accident Analysis & Prevention*, 42, 859-66.  
<http://dx.doi.org/10.1016/j.aap.2009.04.021>
- Lev-Ran, S., Imtiaz, S., Taylor, B.J., Shield, K.D., Rehm, J., & Le Foll, B. (2012). Gender differences in health-related quality of life among cannabis users: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Drug and Alcohol Dependence*, 123, 190-200. <http://dx.doi.org/10.1016/j.drugalcdep.2011.11.010>
- Linden, I.A. (2010). The effect of personal use and family history on the attitudes of medical students toward alcohol and drug users. *Journal of Substance Use*, 15, 377-389.  
<http://dx.doi.org/10.3109/14659890903580458>
- Linn, L.S., Yager, J., & Leake, B. (1989). Physicians' attitudes toward the legalization of marijuana use. *Western Journal of Medicine*, 150, 714-717. Retrieved from  
<http://www.ncbi.nlm.nih.gov/pmc/journals/183/>
- Lobelo, F., Duperly, J., & Frank, E. (2009). Physical activity habits of doctors and medical students influence their counseling practices. *British Journal of Sports Medicine*, 43, 89-92. <http://dx.doi.org/10.1136/bjism.2008.055426>
- Lock, C.A., Kaner, E., Lamont, S., & Bond, S. (2002). A qualitative study of nurses' attitudes and practices regarding brief alcohol intervention in primary health care. *Journal of Advanced Nursing*, 39, 333-342. <http://dx.doi.org/10.1046/j.1365-2648.2002.02294.x>
- López, S.R. (1989). Patient variable biases in clinical judgment: Conceptual overview and methodological considerations. *Psychological Bulletin*, 106, 184-203.  
<http://dx.doi.org/10.1037/0033-2909.106.2.184>
- Lubin, B., Brady, K., Woodward, L., & Thomas, E.A. (1986). Graduate professional psychology

- training in alcoholism and substance abuse: 1984. *Professional Psychology: Research and Practice*, 17, 151-154. <http://dx.doi.org/10.1037/0735-7028.17.2.151>
- Lynskey, M., & Hall, W. (2000). The effects of adolescent cannabis use on educational attainment: a review. *Addiction*, 95, 1621-30. <http://dx.doi.org/10.1046/j.1360-0443.2000.951116213.x>
- MacCoun, R., & Reuter, P. (2001). Evaluating alternative cannabis regimes. *The British Journal of Psychiatry*, 178, 123-128. <http://dx.doi.org/10.1192/bjp.178.2.123>
- Madson, M.B., Bethea, A.R., Daniel, S., & Necaise, H. (2008). The state of substance abuse treatment training in counseling and counseling psychology programs: What is and is not happening. *Journal of Teaching in the Addictions*, 7, 164-178. <http://dx.doi.org/10.1080/15332700802269177>
- Martin, M. (Host). (2009, October 15). In California, marijuana dispensaries outnumber Starbucks [Radio broadcast]. In M. Nelson (Producer), *Tell Me More*. Retrieved from <http://www.npr.org/templates/story/story.php?storyId=113822156>
- McKenna, H., Slater, P., McCance, T., Bunting, B., Spiers, A., & McElwee, G. (2001). Qualified nurses' smoking prevalence: Their reasons for smoking and desire to quit. *Journal of Advanced Nursing*, 35, 769-775. <http://dx.doi.org/10.1046/j.1365-2648.2001.01909.x>
- McMaster, C., & Lee, C. (1991). Cognitive dissonance in tobacco smokers. *Addictive Behaviors*, 16, 349-353. [http://dx.doi.org/10.1016/0306-4603\(91\)90028-g](http://dx.doi.org/10.1016/0306-4603(91)90028-g)
- Meier, M.H., Caspi, A., Ambler, A., Harrington, H., Houts, R., Keefe, R.S.E., ... Moffitt, T.E. (2012). Persistent cannabis users show neuropsychological decline from childhood to midlife. *Proceedings of the National Academy of Sciences of the United States of America*, 109, E2657-64. <http://dx.doi.org/10.1073/pnas.1206820109>

National Institute of Alcohol Abuse and Alcoholism. (2004). NIAAA council approves definition of binge drinking. *NIAAA Newsletter*, 3, 3.

NBC News & The Wall Street Journal. (2014). *NBC News/Wall Street Journal survey*. Retrieved from [http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=4&ved=0CEgQFjAD&url=http%3A%2F%2Fonline.wsj.com%2Fpublic%2Fresources%2Fdocuments%2FWSJNBCpoll03052014.pdf&ei=UxBCU\\_n2KdfLsQTIpIHIBg&usg=AFQjCNGiehtjRI-eAqhZFR8660CCaJRcA&sig2=ZaZgluOZMqvnUA8\\_0ZN5Gg&bvm=bv.64125504,d.cWc](http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=4&ved=0CEgQFjAD&url=http%3A%2F%2Fonline.wsj.com%2Fpublic%2Fresources%2Fdocuments%2FWSJNBCpoll03052014.pdf&ei=UxBCU_n2KdfLsQTIpIHIBg&usg=AFQjCNGiehtjRI-eAqhZFR8660CCaJRcA&sig2=ZaZgluOZMqvnUA8_0ZN5Gg&bvm=bv.64125504,d.cWc)

New Jersey Department of Human Services. (2012, January). *Becoming a licensed clinical alcohol and drug counselor (LCADC) or certified alcohol and drug counselor (CADC): Frequently asked questions regarding the LCADC/CADC process*. Retrieved from [http://www.nj.gov/humanservices/dmhas/initiatives/workforce/FAQs\\_Becoming\\_LCADC\\_CADC.pdf](http://www.nj.gov/humanservices/dmhas/initiatives/workforce/FAQs_Becoming_LCADC_CADC.pdf)

Norberg, M.M., Gates, P., Dillon, P., Kavanagh, D.J., Manocha, R., & Copeland, J. (2012). Screening and managing cannabis use: Comparing GP's and nurses' knowledge, beliefs, and behavior. *Substance Abuse Treatment, Prevention, and Policy*, 7, 1-10.  
<http://dx.doi.org/10.1186/1747-597x-7-31>

Office of National Drug Control Policy. (n.d.). *Marijuana myths & facts: The truth behind 10 popular misperceptions*. Washington, DC: Author.

Pacula, R.L., Powell, D., Heaton, P., & Sevigny, E.L. (2013, August). *Assessing the effects of medical marijuana laws on marijuana and alcohol use: The devil is in the details*. Cambridge, MA: National Bureau of Economic Research.

Parna, K., Rahu, K., Barengo, N.C., Rahu, M., Sandstrom, P.H., Jormanainen, V.J., &

- Mylykangas, M.T. (2005). Comparison of knowledge, attitudes and behaviour regarding smoking among Estonian and Finnish physicians. *Soz Praventimed*, 50, 378-388.  
<http://dx.doi.org/10.1007/s00038-005-4089-z>
- Peduzzi, P., Concato, J., Kemper, E., Holford, T.R., & Feinstein, A.R. (1996). A simulation study of the number of events per variable in logistic regression analysis. *Journal of Clinical Epidemiology*, 49, 1373-1379. [http://dx.doi.org/10.1016/s0895-4356\(96\)00236-3](http://dx.doi.org/10.1016/s0895-4356(96)00236-3)
- Peretti-Watel, P. (2006). Cognitive dissonance and risk denial: The case of cannabis use in adolescents. *The Journal of Socio-Economics*, 35, 1032-1049.  
<http://dx.doi.org/10.1016/j.socec.2005.11.023>
- Pew Research Center. (2013, April 4). *Majority now supports legalizing marijuana*. Washington, D.C.: Author.
- Pew Research Center. (2014, April 2). *America's new drug policy landscape: Two-thirds favor treatment, not jail, for use of heroin, cocaine*. Washington, D.C.: Author.
- Pipe, A., Sorensen, M., & Reid, R. (2009). Physician smoking status, attitudes toward smoking, and cessation advice to patients: An international survey. *Patient Education and Counseling*, 74, 118-123. <http://dx.doi.org/10.1016/j.pec.2008.07.042>
- Pizzo, A.M., Chellini, E., Grazzini, G., Cardone, A., & Badellino, F. (2003). Italian general practitioners and smoking cessation strategies. *Tumori*, 89, 250-254. Retrieved from <http://www.tumorijournal.com/>
- Procon.org. (2014, February 26). *20 legal medical marijuana states and DC: Laws, fees, and possession limits*. Retrieved from <http://medicalmarijuana.procon.org/view.resource.php?resourceID=000881>

- Ramaekers, J.G., Berghaus, G., van Laar, M., & Drummer, O.H. (2004). Dose related risk of motor vehicle crashes after cannabis use. *Drug and Alcohol Dependence*, 73, 109-19.  
<http://dx.doi.org/10.1016/j.drugalcdep.2003.10.008>
- Remnick, D. (2014, January 27). Going the distance: On and off the road with Barack Obama. *The New Yorker*. Retrieved from [http://www.newyorker.com/reporting/2014/01/27/140127fa\\_fact\\_remnick?currentPage=all](http://www.newyorker.com/reporting/2014/01/27/140127fa_fact_remnick?currentPage=all)
- Rogers, L.Q., Gutin, B., Humphries, M.C., Lemmon, C.R., Waller, J.L., Baranowski, T., & Saunders, R. (2006). Evaluation of internal medicine residents as exercise role models and associations with self-reported counseling behavior, confidence, and perceived success. *Teaching and Learning in Medicine*, 18, 215-221.  
[http://dx.doi.org/10.1207/s15328015tlm1803\\_5](http://dx.doi.org/10.1207/s15328015tlm1803_5)
- Russell, G. L., Fujino, D. C., Sue, S., Cheung, M.-K., & Snowden, L. R. (1996). The effects of counselor-client ethnic match in the assessment of mental health functioning. *Journal of Cross-Cultural Psychology*, 27, 598-615. <http://dx.doi.org/10.1177/0022022196275007>
- Salomonsen-Sautel, S., Sakai, J.T., Thurstone, C., Corley, R., & Hopper, C. (2012). Medical marijuana use among adolescents in substance abuse treatment. *Journal of the American Academy of Child and Adolescent Psychiatry*, 51, 694-702.  
<http://dx.doi.org/10.1016/j.jaac.2012.04.004>
- Saunders, J.B., Aasland, O.G., Babor, T.F., de la Fuente, J.R., & Grant, M. (1993). Development of the Alcohol Use Disorders Screening Test (AUDIT). WHO collaborative project on early detection of persons with harmful alcohol consumption. *Addiction*, 88, 791-804.  
<http://dx.doi.org/10.1111/j.1360-0443.1993.tb02093.x>
- Schwarz, N., & Boehner, G. (2001). The construction of attitudes. In A. Tesser & N. Schwarz

- (Eds.), *Blackwell handbook of social psychology: Intrapersonal processes* (Vol. 1, pp. 436–457). Oxford, England: Blackwell.
- Secades-Villa, R., Garcia-Rodríguez, O., Jin, C.J., Wang, S., & Blanco, C. (2015). Probability and predictors of the cannabis gateway effect: A national study. *International Journal of Drug Policy*, 26, 135-42. <http://dx.doi.org/10.1016/j.drugpo.2014.07.011>
- Selin, J.A., & Svanum, S. (1981). Alcoholism and substance abuse training: A survey of graduate programs in clinical psychology. *Professional Psychology*, 12, 717-721. <http://dx.doi.org/10.1037/0735-7028.12.6.717>
- Selway, W. (2014, March 4). Pot decriminalization approved by Washington city council. *Bloomberg*. Retrieved from <http://www.bloomberg.com/news/2014-03-05/marijuana-decriminalization-approved-by-washington-d-c-.html>
- Seton Hall University. (2009). *Guide to practicum training, 2009-10*. Retrieved from <https://www13.shu.edu/academics/education/phd-counseling-psychology/upload/PracGuide0910NewAgreement.pdf>
- Slaughter, J.B. (1988). Marijuana prohibition in the United States: History and analysis of a failed policy. *Columbia Journal of Law and Social Problems*, 51, 417-74. Retrieved from <http://www.columbia.edu/cu/jlsp/>
- Snowden, L. R. (2003). Bias in mental health assessment and intervention: Theory and evidence. *American Journal of Public Health*, 93, 239-42. <http://dx.doi.org/10.2105/ajph.93.2.239>
- Squier, C., Hesli, V., Lowe, J., Ponamorenko, V., & Medvedovskaya, N. (2006). Tobacco use, cessation advice to patients and attitudes to tobacco control among physicians in Ukraine. *European Journal of Cancer Prevention*, 15, 458-463. <http://dx.doi.org/10.1097/00008469-200610000-00012>



- State marijuana laws map. (2015, June 19). *Governing*. Retrieved from <http://www.governing.com/gov-data/state-marijuana-laws-map-medical-recreational.html>
- Stinson, F.S., Ruan, W.J., Pickering, R., & Grant, B.F. (2006). Cannabis use disorders in the USA: Prevalence, correlates and co-morbidity. *Psychological Medicine*, 36, 1447-60. <http://dx.doi.org/10.1017/s0033291706008361>
- Stoltzfus, J.C. (2011). Logistic regression: A brief primer. *Academic Emergency Medicine*, 18, 1099-1104. <http://dx.doi.org/10.1111/j.1553-2712.2011.01185.x>
- Substance Abuse and Mental Health Services Administration [SAMHSA]. (2013a). *Drug Abuse Warning Network, 2011: National Estimates of Drug-Related Emergency Department Visits*. Rockville, MD: Author.
- Substance Abuse and Mental Health Services Administration [SAMHSA]. (2013b). *Results from the 2012 National Survey on Drug Use and Health: Summary of National Findings*. Rockville, MD: Author.
- Szalavitz, M. (2010, October 19). Is marijuana addictive? It depends how you define addiction. *Time*. Retrieved from <http://healthland.time.com/2010/10/19/is-marijuana-addictive-it-depends-how-you-define-addiction/>
- Tagliacozzo, R. (1979). Smokers' self-categorization and the reduction of cognitive dissonance. *Addictive Behaviors*, 4, 393-399. [http://dx.doi.org/10.1016/0306-4603\(79\)90010-8](http://dx.doi.org/10.1016/0306-4603(79)90010-8)
- Wall, M, Poh, E., Cerdá, M, Keyes, K.M., Galea, S., & Hasin, D.S. (2011). Adolescent marijuana use from 2002 to 2009: Higher in states with medical marijuana laws, cause still unclear. *Annals of Epidemiology*, 21, 714-716. <http://dx.doi.org/10.1016/j.annepidem.2011.06.001>
- White, W. (2000a). The history of recovered people as wounded healers: I. From Native America

- to the rise of the modern alcoholism movement. *Alcoholism Treatment Quarterly*, 18, 1-23. [http://dx.doi.org/10.1300/j020v18n01\\_01](http://dx.doi.org/10.1300/j020v18n01_01)
- White, W. L. (2000b). The history of recovered people as wounded healers: II. The era of professionalization and specialization. *Alcoholism Treatment Quarterly*, 18, 1-25. [http://dx.doi.org/10.1300/j020v18n02\\_01](http://dx.doi.org/10.1300/j020v18n02_01)
- Wilkinson, S.T., Stefanovics, E., & Rosenheck, R.A. (2015). Marijuana use is associated with worse outcomes in symptoms severity and violent behavior in patients with posttraumatic stress disorder. *Journal of Clinical Psychiatry*, 76, 1174-80. <http://dx.doi.org/10.4088/jcp.14m09475>
- World Health Organization. (1992). *International classification of diseases* (10<sup>th</sup> ed.). Geneva, Switzerland: Author.
- Yan, J., Xiao, S., Ouyang, D., Jiang, D., He, C., & Yi, S. (2008). Smoking behavior, knowledge, attitudes and practice among health care providers in Changsha City, China. *Nicotine & Tobacco Research*, 10, 737-744. <http://dx.doi.org/10.1080/14622200801901930>
- Zerubavel, N., & O'Dougherty Wright, M. (2012) The dilemma of the wounded healer. *Psychotherapy*, 49, 482-91. <http://dx.doi.org/10.1037/a0027824>
- Zhu, D., Norman, I.J., & While, A.E. (2011). The relationship between doctors' and nurses' own weight status and their weight management practices: A systematic review. *Obesity Reviews*, 12, 324-337. <http://dx.doi.org/10.1111/j.1467-789x.2010.00821.x>

## Appendix A

## Letter of Solicitation (for Snowball Sampling Distribution)

Dear fellow doctoral student,

Hello, my name is Alexandra Stratyner, and I am a student in Seton Hall University's Counseling Psychology Ph.D. program. I am currently collecting data for my dissertation. My research examines possible factors that influence clinical judgment among doctoral psychology trainees. **As part of this research, I am seeking psychology trainees enrolled in doctoral programs in clinical, counseling, or school psychology or related disciplines** (e.g., clinical developmental psychology, clinical forensic psychology, clinical neuropsychology, etc.). The results of this study will hopefully help psychology trainees and psychologists to better understand the role that select individual qualities may play in case conceptualization and diagnosis.

Participation is a simple process: The study consists of an online survey that is easy to fill out and which you can complete at your convenience from any device with internet access. The survey should take no more than **15 minutes** to complete. After consenting to participate, you will be asked to answer a series of demographic questions. Next, you will read a brief vignette about a hypothetical client and be asked to answer questions based on your opinions about the vignette. You will then be asked to complete three brief questionnaires. These questionnaires will ask you about your behavior, as well as your thoughts and beliefs about yourself, others, and different situations and issues. It is possible that some of the questions will ask you about sensitive topics. If completing these questionnaires causes you any distress, you can find a psychologist in your area at <http://locator.apa.org>. Participants will not be required to answer any questions that they do not want to answer; however, I anticipate that the study questions will be interesting to fellow doctoral psychology trainees. At the conclusion of the study, participants will have the option of being entered into a drawing for one of six \$50 Amazon e-gift cards as a token of my appreciation for their help with my dissertation research.

**Participation in this study is completely voluntary.** You do not have to answer any questions that you do not wish to answer, and you are free to withdraw at any time.

**Additionally, participation in this study is anonymous.** The survey will not ask you for any identifying information, nor will any identifying information be collected by the survey platform (e.g., IP addresses). If you choose to enter the drawing at the conclusion of the study, you will be taken to a separate survey; no contact information provided for these purposes will be associated with study data. Additionally, the study will look at participants as a group, and no information you provide will be evaluated or compared on an individual basis.

All survey data will be collected via Qualtrics, a secure server-based survey platform. All data **collected online will be subject to Qualtrics security and private policies to**

**ensure that all information collected is encrypted and made available only to authorized users.** While the researchers take every reasonable step to protect your privacy, there is always the possibility of interception or hacking of the data by third parties that is not under the control of the research team.

To ensure the security and privacy of all information collected, all data will be kept on a USB flash drive in a locked filing cabinet, which can only be accessed by Ms. Stratyner and her academic advisor, Dr. Laura Palmer.

If you are at least 18 years old, are currently a doctoral student in a Ph.D., Psy.D., or Ed.D. program, and are willing to participate in this study, please click on the following link: [https://shucehs.co1.qualtrics.com/SE/?SID=SV\\_0SVdlwnqQv6WBNz](https://shucehs.co1.qualtrics.com/SE/?SID=SV_0SVdlwnqQv6WBNz). Your completing the survey will serve as your consent to participate in the study. **The survey will be open between April 1, 2015 and June 30, 2015.** If you choose to participate, please visit the website between those dates.

**Students at any phase in their doctoral training, including current interns and students who have already completed internship are eligible to participate. In addition, I would greatly appreciate it if you would forward this e-mail to any other doctoral students who you think might be interested in participating.**

If you have any questions or concerns about this study, please feel free to contact me (914-715-9346 or [alexandra.stratyner@student.shu.edu](mailto:alexandra.stratyner@student.shu.edu)) or my advisor, Dr. Laura Palmer (973-275-2740 or [laura.palmer@shu.edu](mailto:laura.palmer@shu.edu)). If you have questions regarding your rights as a research participant, please contact Dr. Mary F. Ruzicka, Director of the Seton Hall University Institutional Review Board (IRB), at [irb@shu.edu](mailto:irb@shu.edu) or (973) 313-6314.

Thank you for your consideration!

*You may print this information for your personal records.*

## Appendix B

## Letter of Solicitation (for Distribution to Doctoral Program Training Directors)

Dear [TRAINING DIRECTOR],

Hello, my name is Alexandra Stratyner, and I am a student in Seton Hall University's Counseling Psychology Ph.D. program. I am currently collecting data for my dissertation. My research examines possible factors that influence clinical judgment among doctoral psychology trainees. As part of this research, I am seeking psychology trainees enrolled in doctoral programs in clinical, counseling, or school psychology or related disciplines (e.g., clinical developmental psychology, clinical forensic psychology, clinical neuropsychology, etc.). The results of this study will hopefully help those involved in the training of psychologists to better understand the role that select individual qualities may play in trainees' approaches to case conceptualization and diagnosis.

As a training director, I would greatly appreciate it if you would forward information about my research to your current students who may be interested in participating. I have enclosed detailed information about the study below. *In an effort to avoid potential coercion, please ask your department secretary, graduate assistant, or an equivalent staff member to distribute the information included below.*

Thank you very much for your consideration. Should you have any questions about this request or about my dissertation research, please do not hesitate to contact me (914-715-9346 or alexandra.stratyner@student.shu.edu) or my advisor, Dr. Laura Palmer (973-275-2740 or laura.palmer@shu.edu).

Again, my sincerest thanks,

Alexandra G. Stratyner, MA

---

Dear [UNIVERSITY] students,

Hello, my name is Alexandra Stratyner, and I am a student in Seton Hall University's Counseling Psychology Ph.D. program. I am currently collecting data for my dissertation. My research examines possible factors that influence clinical judgment among doctoral psychology trainees. **As part of this research, I am seeking psychology trainees enrolled in doctoral programs in clinical, counseling, or school psychology or related disciplines** (e.g., clinical developmental psychology, clinical forensic psychology, clinical neuropsychology, etc.). The results of this study will hopefully help psychology trainees and psychologists to better understand the role that select individual qualities may play in case conceptualization and diagnosis.

Participation is a simple process: The study consists of an online survey that is easy to fill out and which you can complete at your convenience from any device with internet access. The survey should take no more than **15 minutes** to complete. After consenting to participate, you will be asked to answer a series of demographic questions. Next, you will read a brief vignette about a hypothetical client and be asked to answer questions based on your opinions about the vignette. You will then be asked to complete three brief questionnaires. These questionnaires will ask you about your behavior, as well as your thoughts and beliefs about yourself, others, and different situations and issues. It is possible that some of the questions will ask you about sensitive topics. If completing these questionnaires causes you any distress, you can find a psychologist in your area at <http://locator.apa.org>. Participants will not be required to answer any questions that they do not want to answer; however, I anticipate that the study questions will be interesting to fellow doctoral psychology trainees. At the conclusion of the study, participants will have the option of being entered into a drawing for one of six \$50 Amazon e-gift cards as a token of my appreciation for their help with my dissertation research.

**Participation in this study is completely voluntary.** You do not have to answer any questions that you do not wish to answer, and you are free to withdraw at any time.

**Additionally, participation in this study is anonymous.** The survey will not ask you for any identifying information, nor will any identifying information be collected by the survey platform (e.g., IP addresses). If you choose to enter the drawing at the conclusion of the study, you will be taken to a separate survey; no contact information provided for these purposes will be associated with study data. Additionally, the study will look at participants as a group, and no information you provide will be evaluated or compared on an individual basis.

All survey data will be collected via Qualtrics, a secure server-based survey platform. All data **collected online will be subject to Qualtrics security and private policies to ensure that all information collected is encrypted and made available only to authorized users.** While the researchers take every reasonable step to protect your privacy, there is always the possibility of interception or hacking of the data by third parties that is not under the control of the research team.

To ensure the security and privacy of all information collected, all data will be kept on a USB flash drive in a locked filing cabinet, which can only be accessed by Ms. Stratyner and her academic advisor, Dr. Laura Palmer.

If you are at least 18 years old, are currently a doctoral student in a Ph.D., Psy.D., or Ed.D. program, and are willing to participate in this study, please click on the following link: [https://shucehs.co1.qualtrics.com/SE/?SID=SV\\_0SVdlwnqQv6WBNz](https://shucehs.co1.qualtrics.com/SE/?SID=SV_0SVdlwnqQv6WBNz). Your completing the survey will serve as your consent to participate in the study. **The survey will be open between April 1, 2015 and June 30, 2015.** If you choose to participate, please visit the website between those dates.

**Students at any phase in their doctoral training, including current interns and students who have already completed internship are eligible to participate. In addition, I would greatly appreciate it if you would forward this e-mail to any other doctoral students who you think might be interested in participating.**

If you have any questions or concerns about this study, please feel free to contact me (914-715-9346 or alexandra.stratyner@student.shu.edu) or my advisor, Dr. Laura Palmer (973-275-2740 or laura.palmer@shu.edu). If you have questions regarding your rights as a research participant, please contact Dr. Mary F. Ruzicka, Director of the Seton Hall University Institutional Review Board (IRB), at irb@shu.edu or (973) 313-6314.

Thank you for your consideration!

*You may print this information for your personal records.*

## Appendix C

## Demographic Information

For each of the items below, please select the response that best describes you.

1. Age: [Drop down menu with ages beginning at 18]
2. Sex: Male, Female, Other
3. Racial or Ethnic Background:
  - African American, Caribbean American, or Black
  - Asian American
  - Latina/Latino
  - Native American
  - White (non-Hispanic)
  - Biracial/Multiracial (Please specify: \_\_\_\_\_)
  - International Student (Please specify your national origin: \_\_\_\_\_)
  - Other (Please specify: \_\_\_\_\_)
4. Religious Preference:
  - Buddhist
  - Catholic/Christian
  - Hindu
  - Jewish
  - Muslim
  - Native American
  - Pagan
  - Sikh
  - Spiritualist
  - Unitarian/Universalist
  - Wiccan
  - Atheist
  - Agnostic
  - Humanist
  - No Religion
  - Multifaith (Please specify: \_\_\_\_\_)
  - Other (Please specify: \_\_\_\_\_)
5. Political Affiliation:
  - Democrat
  - Republican
  - Independent
  - Other (Please specify: \_\_\_\_\_)



## 6. Doctoral Program Type:

Ed.D.  
Ph.D.  
Psy.D.

## 1. Doctoral Program Discipline:

Counseling Psychology  
Clinical Psychology  
Other (e.g., Clinical Developmental Psychology, Clinical Forensic Psychology,  
Clinical Neuropsychology, etc. Please specify: \_\_\_\_\_)

## 2. Year in Doctoral Program:

1<sup>st</sup>  
2<sup>nd</sup>  
3<sup>rd</sup>  
4<sup>th</sup>  
5<sup>th</sup>  
6<sup>th</sup>  
7<sup>th</sup> year and beyond

3. Are you currently completing, or have you completed your pre-doctoral internship?  
(Yes/No)

## Appendix D

## Vignette Depicting Cannabis Use Disorder

John is a 21-year-old college junior who is majoring in psychology. He presents at the counseling center, where you are an extern, after the resident assistant assigned to his dormitory noticed the smell of marijuana coming from his room last Thursday and reported him for a violation of the college's drug and alcohol policy; as a condition of this violation, he is required to meet with a therapist for a drug and alcohol use assessment.

John reports that he first tried marijuana when he was 18. John says that he has been smoking marijuana most days of the week for "about a year," although he notes that he always waits to smoke until he is done with classes for the day. When you ask John what he likes about using marijuana, he reports that marijuana helps him relax; he says that after he smokes, he spends the rest of the afternoon and evening listening to music or watching television shows on Netflix with friends who live in his dormitory, who sometimes smoke with him. John reports that his marijuana use hasn't impacted his grades or his relationships with his friends or family; however, he notes that he doesn't speak with his parents often anymore, because he will not answer his cell phone if they call him when he is high. John also reports that his girlfriend of six months broke up with him three months ago because she was unhappy with his marijuana use. John stated that he sometimes gets into arguments with his roommate, who complains that John neglects to clean up after himself and worries that their dorm room smells of marijuana. John is not involved in any extracurricular activities. He reports that he is considering applying for internships this summer, but is concerned because many employers require drug testing. John reports that he consumes alcohol infrequently, stating that he "has a couple beers, maybe every few weeks, but I don't like drinking much." He denies smoking cigarettes or using any other substances. John has no history of significant medical illness or injury.

Does John have cannabis use disorder?

Yes

No

## Appendix E

## Questions about Cannabis Use

1. Have you ever used cannabis? (Yes/No)
2. Have you used cannabis in the past 12 months? (Yes/No)

## Appendix F

## Cannabis Use Problems Identification Test (CUPIT)

(Bashford et al., 2010)

The CUPIT is available as a free, downloadable PDF from the National Cannabis Prevention and Information Centre (NCPIC) of Australia.

NCPIC

PO Box 684

Randwick NSW 2031

Australia

Telephone: +61 2 9385 0208

Website: <https://ncpic.org.au>Direct Link to CUPIT PDF: <https://ncpic.org.au/media/1591/updated-cupit-tool-may-2010.pdf>

## Appendix G

## Perceptions of Cannabis Use Risks Questionnaire (PCURQ)

(Adapted from Kondrad &amp; Reid, 2013)

Please rate the extent to which you agree or disagree with the following statements.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

1. Marijuana can be addictive.
2. Using marijuana poses serious physical health risks.
3. Using marijuana poses serious mental health risks.
4. There are significant physical health benefits to using marijuana.\*
5. There are significant mental health benefits to using marijuana.\*

\* = Reverse-scored item.

## Appendix H

## Substance Abuse Attitude Survey (SAAS)

(Chappel et al. 1985)

The SAAS is available from the Ralph G. Connor Research Reference Files (CARRF) at Rutgers University.

Ralph G. Connor Research Reference Files (CARRF)  
Center of Alcohol Studies, Rutgers University  
607 Allison Road  
Piscataway, NJ 08854  
Telephone: 848-445-2190  
Fax: 732-445-3500  
Website: <http://library.alcoholstudies.rutgers.edu/resources/special/carrf>

## Appendix I

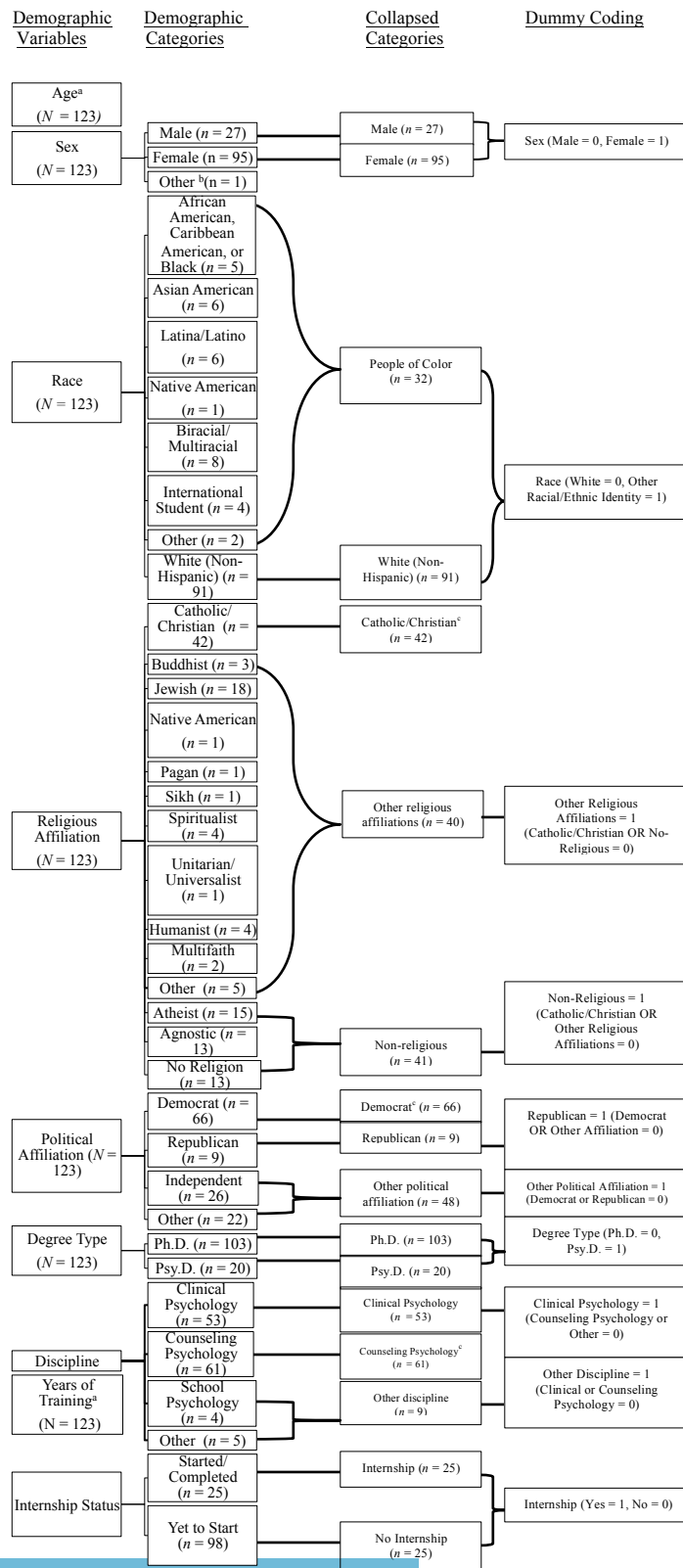
## Substance Use Disorders Training Survey Question

Which of the following substance use disorder treatment training experiences have you received?  
(Please select all that apply.)

- I have taken a graduate-level course (or multiple courses) on addiction or substance use disorder treatment.
- I have attended a workshop or conference on addiction or substance use disorder treatment.
- I am currently completing, or have previously completed, an externship, internship, or similar clinical training experience in which substance use disorders treatment was a primary focus.
- I have worked with clients with problem substance use or substance use disorder diagnoses.
- I have conducted research on substance use/addiction.
- I have completed training toward certification as a substance abuse counselor, or am certified as a substance abuse counselor.
- Other (Please specify: \_\_\_\_\_)
- I have never received training in the treatment of substance use disorders.

Appendix J

Demographic Variable Taxonomy



Combinations of continuous and/or dummy coded collapsed categorical variables generated, resulting in first-order interactions for combinations of all demographics (e.g., Age\* Counseling Psychology).

<sup>a</sup>Continuous variable. <sup>b</sup>Variable could not be meaningfully collapsed with other categories; due to low sample size (n = 1), this demographic category was removed from further analysis. <sup>c</sup>Reference group for category.



## Appendix K

## Permission to Adapt Questionnaire Originally Used in Kondrad &amp; Reid (2013)

RE: Request to Utilize Survey Items from "Colorado Family Physicians' Attitudes Toward Medical Marijuana" in Dissertation Research

Kondrad, Elin C. &lt;[EMAIL REDACTED]&gt;

to Alexandra &lt;&gt;

Hi Alexandra,

It would be fine for you to use part of the survey. I have attached a copy of the original questions for your reference. Please just appropriately reference this article if you end up using the survey questions. Good luck with your dissertation.

Elin

Elin Kondrad  
 Clinic Medical Director  
 St. Anthony North Family Medicine Residency  
 [CONTACT INFORMATION REDACTED]

From: Alexandra G Strzyner

Sent: Friday, April 25, 2014 5:40 PM

To: Kondrad, Elin C.

Subject: Request to Utilize Survey Items from "Colorado Family Physicians' Attitudes Toward Medical Marijuana" in Dissertation Research

Dear Dr. Kondrad,

Hello, my name is Alexandra Strzyner and I am a counseling psychology doctoral student at Seton Hall University. I am writing to ask if you would be willing to allow me to use a selection of survey items which you originally included in your study, "Colorado Family Physicians' Attitudes Toward Medical Marijuana." Specifically, I would like to use the items listed in Table 2 of your article, "Comparison of Survey Respondents Who Have Recommended Medical Marijuana for a Patient With Those Who Have Not", which address participants' personal attitudes toward medical and recreational marijuana and their perceptions of the risks and benefits of marijuana use. I am currently in the process of developing my dissertation, which will examine the effects of psychology doctoral students' attitudes toward marijuana and personal marijuana use on their ability to identify cannabis use disorder, and I found your article extremely helpful in my research.

For the purposes of my research, I would like to utilize the statements included in your article in an online survey. I will be utilizing Qualtrics, an internet-based secure survey platform, to administer my survey. I would be extremely grateful if you would allow me to use your survey items in this manner. If you would like any additional information about my administration procedures in order to ensure that your survey items will be secure, I would be glad to provide this.

When I have completed my dissertation, I would, of course, be happy to communicate the results to you.

Thank you for your consideration. I look forward to hearing from you.

Sincerely,

Alexandra G. Strzyner, MA  
 Doctoral Student, Seton Hall University  
 Counseling Psychology PhD Program

.....  
 This communication is for the use of the intended recipient only. It may contain information that is privileged and confidential. If you are not the intended recipient of this communication, any disclosure, copying, further distribution or use thereof is prohibited. If you have received this communication in error, please advise me by return e-mail or by telephone and delete/destroy it.  
 .....



## Appendix L

## Permission to Reprint Items from Kondrad &amp; Reid (2013)

On May 26, 2016, at 5:08 PM, Kondrad, Elin, C < EMAIL REDACTED > wrote:

Hi Alexandra,

[REDACTED – UNRELATED TEXT] I am fine with you reprinting these items. I'm glad that you were able to use them.

Best of luck with the last stages of your doctorate!

Elin

## Appendix M

## Permission to Use the Substance Abuse Attitude Survey (SAAS; Chappel et al., 1985)

SAAS instrument ▶ Inbox x

📧 4/29/14 ☆ ↩️ ▾

---

**William Bejarano** <[EMAIL ADDRESS REDACTED]> >  
to Alexandra ▾

Good morning Ms. Stratyner,

We can provide the SAAS survey, but we do charge \$30 as a processing fee. You will receive five files in pdf format: (1) the full SAAS survey, (2) the Brief SAAS survey, (3) a handout explaining the brief survey, (4) The SAAS/BSAAS Information Sheet, and (5) the article "The Substance Abuse Attitude Survey: An Instrument for Measuring Attitudes" from the Journal of Studies on Alcohol

If you are still interested, please fill out the attached form and we can speak over the phone for credit card information.

Thank you for your interest and have a wonderful day.

-----  
Bill Bejarano, M.A.  
Information Specialist  
Center of Alcohol Studies  
Rutgers, The State University of New Jersey  
[CONTACT INFORMATION REDACTED]

> To Whom It May Concern,  
>  
> Hello, my name is Alexandra Stratyner and I am a counseling psychology  
> doctoral student at Seton Hall University. I am currently in the process  
> of developing my dissertation, and I am interested in using the Substance  
> Abuse Attitude Survey (SAAS) According to Chappel, Veach, & Krug's (1985)  
> article on the assessment, it is available from the Ralph G. Connor  
> Alcohol Research Reference Files at the Rutgers' Center of Alcohol  
> Studies. If you could please assist me in locating a copy of this  
> assessment, I would greatly appreciate it. I am hoping to utilize this  
> measure in a web-based survey run through Qualtrics, and accordingly do  
> not anticipate that I will need access to machine-scorable forms. If it is  
> possible to access a digital copy of the assessment (e.g., a PDF) this  
> would be ideal.  
>  
> Thank you very much for your assistance. I look forward to speaking with  
> you.  
>  
> Sincerely,  
> Alexandra Stratyner, MA  
> Doctoral Student, Counseling Psychology  
> Seton Hall University  
>