INCREASING SUPPORT FOR ALTERNATIVES TO INCARCERATION FOR DRUG

USE: IS THE BRAIN DISEASE MODEL OF ADDICTION EFFECTIVE?

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by

Mia M. Ricardo

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DEDICATION

To 2009, 2011, 2015 and 2017 versions of me.

ABSTRACT

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The National Institute of Drug Addiction (NIDA) has promoted the Brain Disease Model of Addiction (BDMA) for several decades under the premise that its acceptance will have a positive impact on a variety of drug-related social policies. Considerable research has suggested that neither understanding nor accepting the BDMA positively influences social behavior and decision making as it relates to decreasing stigma or increasing support for treatment and funding for substance use disorders. An alternative model (deemed here the Malleability Model; MM) focuses on the changeability of the underlying psychopathology associated with psychiatric disorders. This model has shown to decrease hopelessness and increase prognostic optimism. The current study sought to identify whether MM values are more predictive of willingness to vote for harm reduction policies than BDMA values (H1), and if agreement with MM values are more predictive of willingness to fund such policies than agreement with BDMA values (H2). Results indicated that the MM failed to predict placement of votes and donated funds, while agreement with morally based perspectives and conservative political affiliation were predictive of a reduction in harm reduction donations. Agreement with the BDMA predicted increased donations to harm reduction policies but not votes to harm reduction policies. Results of this study indicate that although the MM did not increase votes and donations to harm reduction policies, unexpectedly, the BDMA may appeal to individuals willing to donate funds on a personal rather than governmental level.

KEY WORDS: Brain disease model; Harm reduction; Malleability; Drug use

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CHAPTER I

Introduction

In 2017, the acting Health and Human Services Secretary publicly announced that America is in the midst of a nationwide health emergency due to the opioid crisis (US Department of Health and Human Services, 2017). In the US, approximately 116 people die every day due to opioid overdoses (Seth et al., 2018). In an attempt to address this issue, the Attorney General of the United States enacted policy changes that increased punitive responses to drug crimes, including "strong encouragement" to seek capital punishment for some drug offenses (Office of the Attorney General, 2017, 2018a, 2018b), despite capital punishment for drug offenses violating international laws (Lines, 2009). In 2018, the federal government passed the Substance Use Disorder Prevention that Promotes Opioid Recovery and Treatment for Patients and Communities Act (SUPPORT for Patients and Communities Act; U.S. Congress, 2018). This act expanded Medicaid provisions to help address the opioid crisis in a variety of ways, including allowing increased access to treatment for those with opioid use disorders; however, embedded within the act is the right for the Drug Enforcement Agency to create a new schedule of illicit drugs and create criminal penalties associated with possession and distribution of such substances classified under that schedule (U.S. Congress, 2018). This stark contrast in policy within a single congressional act underscores the persistent nature of punitive drug policy within the United States.

As an alternative to correctional policies, harm reduction has been defined as "strategies, grounded in public health and human rights, that aim to reduce the adverse health and social consequences of drug use without necessarily decreasing drug

consumption" (McGinty et al., 2018, p. 73). Harm reduction initiatives, such as needle exchange programs, have received an increase in state and local funding (Des Jarlais et al., 2009). Federal funding for such programs can only be awarded once an eligible state, local, tribal, or territorial health department provides evidence their jurisdiction is at risk for a significant increase in communicable diseases due to injection drug use (Center for Disease Control, 2018). Such policy implies that federal funding is only available when a problem can be proven as occurring or impending, rather than used proactively. Backing by the American public for needle exchange programs has decreased over time from 58% in 2000, to 39% in 2017 (McGinty et al., 2018). Other data suggests majority public support for harm reduction policies, such as alternatives to incarceration for drug offenses (Giordano, 2014), underscoring variability in public backing for harm reduction policies. Taken together, research and recent public policy changes indicate vacillating opinions with respect to harm-reduction and alternatives to incarceration as strategies to address the opioid epidemic.

Disease Model

The Brain Disease Model of Addiction (BDMA) is a model used to explain the development of substance use addiction and has been proposed to increase support for humanistic approaches to the treatment of addiction for several decades (Leshner, 1997). For the purpose of this study, "addiction" is defined according to Volkow, Koob and McLellan (2016), who delineate recreational use from more severe forms of physical dependence/problematic use. According to Volkow and colleagues (2016), "addiction" can be used interchangeably with "substance-use disorder" (SUD) only when the severity of the SUD meets the diagnostic criteria for a "severe" specifier (6 or more symptoms).

Further inquiry regarding these diagnostic criteria can be found in the 5th edition of the

Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric

Association, 2013).

Regarding the BDMA, this model posits that addiction is a disease of the brain

and develops biologically at the cellular, structural, molecular, and functional levels, at

which time physical dependence emerges (Hall et al., 2015; Volkow et al., 2016).

Proponents of the BDMA assert that addiction is an acquired chronic, relapsing disease of

the brain that occurs when drug use, "essentially hijack[s] brain circuits that exert

considerable dominance over rational thought, leading to progressive loss of control over

drug intake…" (Dackis & O'Brien, 2005, p. 1432). Scientific support for the BDMA

indicates that brain changes associated with the process of addiction impair one's ability

to discontinue substance use regardless of intention or significant negative consequences

secondary to use. Further, these changes inhibit one's ability to remain abstinent once

sobriety is achieved (Leshner, 1997; National Institute of Drug Abuse, 2016; Volkow et

al., 2016). Although there is considerable debate in the field regarding the accuracy of

the neurobiological evidence in support of the BDMA (Hall et al., 2015; Lewis, 2017,

2018), the purpose of this study is not to question the neurobiology of the BDMA but to

critically evaluate the efficacy of the model's use to increase public and sociopolitical

support for alternatives to incarceration of those with SUDs.

Promotion of the Model

In 1997, the director of the NIDA wrote a seminal article detailing his support for

the BDMA. Presently, both the NIDA and the American Society of Addiction Medicine

(ASAM) agree with this perspective and define drug and alcohol addiction as a chronic,

relapsing disease of the brain (ASAM, 2011; NIDA, 2016). Leshner (1997) emphasized that should the BDMA be broadly accepted by policy makers and health professionals, there would be a significant, positive impact on public health strategies, treatment of addiction, the criminal justice system, and perceptions of those with SUDs. The current director of the NIDA has discussed a belief that public knowledge on the neurobiology of drug use and understanding of the adaptive changes associated with substance use will lead to new strategies for prevention and treatment of addiction (Volkow & Li, 2004).

Conceptually, agreement with the BDMA would result in increased public acceptance of addiction as an acquired medical rather than behavioral condition, increased access to medical treatment, and increased funding for treatment through the medical field. Further, it purportedly would lead to a reduction in stigma, increased treatment-seeking and compliance in treatment, and a reduction in incarceration associated with substance use (Bell et al., 2014; Heather, 2017; Meurk et al., 2014). Both the NIDA and the National Institute of Alcohol Abuse and Alcoholism (NIAAA) have made it a priority to fund studies that investigate questions regarding substance use from the perspective of the BDMA (Hall et al., 2017). In an effort to disseminate research and support for the BDMA, these same institutes have conducted "well-funded, high public profile education and advocacy efforts in favour of the BDMA over the past 20 years" (Hall et al., 2017, p. 104). Research on the efficacy of the BDMA to deliver on its promises has been variable, with studies suggest the model is largely ineffective at increasing public support for a variety of purposes (Hall et al., 2015), as discussed in the following sections.

Public Attitudes and Impact

In the general public, attitudes towards those with SUDs are overwhelmingly negative (Blum et al., 1989; Meurk et al., 2014). The stigma associated with SUDs is greater when compared to attitudes expressed by the general public regarding other mental health disorders (Barry et al., 2014). As of 2014, 90% of individuals were unwilling to allow those with a SUD to marry into the family, compared to 59% of individuals being unwilling to allow someone with general mental illness to marry into the family (Barry et al., 2014). Individuals are more likely to agree that employers should be allowed to deny jobs to those with SUDs (64%) compared to those with general mental illness (25%; Barry et al., 2014). In the work environment, individuals are significantly less likely to be willing to work with someone that has a SUD, compared to general mental illness (Barry et al., 2014). In other Westernized countries, individuals exhibit stronger stigmatizing beliefs towards those with illicit drug use disorders than those with alcohol use disorders, seemingly conceptualizing the addictive nature of the substances differently (Meurk et al., 2014).

Across the United States and Westernized countries, there has been an increase in public acceptance of the BDMA and neurobiological factors associated with mental illness, but without a subsequent reduction in stigmatizing beliefs (Pescosolido et al., 2010). Notably, holding a neurobiological perspective of a variety of mental illnesses, including substance use disorders, has been associated with either no reduction in stigma or an increase stigmatizing attitudes (Lebowitz et al., 2013; Pescosolido et al., 2010). Meurk and colleagues (2013) conducted qualitative interviews with members of the Australian general public in an effort to capture deliberations regarding the concept of

addiction as a brain disease. They ultimately found that although 58% of their sample agreed that knowledge of the BDMA would change their views on those with SUDs to be more empathetic, this understanding did not actually increase empathy for those with addiction. Their participants expressed that, regardless of the definition or origins of addiction, a person's responsibility for the development of drug addiction is not nullified (Meurk et al., 2013). When this concept was examined in a forensic capacity, agreement with the BDMA did not predict that participants would select shorter sentence lengths on a hypothetical mock juror sentencing task, providing further data to support that agreement with the BDMA is not related to empathy or a lessening of culpability (Ricardo et al., 2020).

Practitioner, Student, and Academic Perspectives

Arguably, it would be expected that medical and mental health practitioners would be a subset of the general public more likely to endorse the BDMA and subsequently express empathy towards those with SUDs; however, research has suggested this is not the case (Bell et al., 2004; Kloss & Lisman, 2003; Lawrence et al., 2003). In 2014, Lebowitz and Ahn conducted a study to identify the degree of impact a biological explanation for patient mental health symptoms would have on mental health clinician empathy. The results of their study indicated that mental health clinicians were significantly less empathetic towards patients when a biological explanation was employed to explain patient symptoms, as compared to when a psychosocial explanation was provided (Lebowitz & Ahn, 2014). In 2003, Kloss and Lisman found a moderate to high (78%) endorsement of the disease model by mental health clinicians, while simultaneously finding high rates of blame attribution (the responsibility for causing their

problem) towards individuals with co-occurring diagnoses. General practice mental health clinicians were significantly more likely to attribute blame to those with co-occurring disorders than clinicians that practiced only in the area of substance use (Kloss & Lisman, 2003). Skepticism towards the importance of the BDMA has also been found among practitioners and neuroscientists in Australia (Bell et al., 2014). A qualitative analysis of the opinions of practitioners and neuroscientists in Australia regarding the utility of the BDMA resulted in less than one third of the participants strongly endorsing the model (Bell et al., 2014).

Similar results are found on data collected from medically trained mental health and primary care physicians (PCPs; Lawrence et al., 2003). This study identified that 11% of psychiatrists and PCPs believed that moral failings play a significant role in the development of addiction (Lawrence et al., 2003). Attempts to intervene and reduce stigma during the academic learning phase of graduate medical programs were found to be largely unsuccessful (Crapanzano et al., 2014). In a multipart educational intervention, physician's assistant graduate students attended didactics about basic neurobiological factors associated with the development and maintenance of addiction, among other learning modules. When assessed post-intervention, participants reported improved attitudes toward those that use illicit drugs; however, results exhibited small effect sizes and attitudes remained negative overall. In addition to students' continued struggle to accept a biological basis for addiction, the investigators noted their greatest disappointment was that "half of the students continued to express stigmatizing beliefs with factual errors" (Crapanzano et al., 2014). This may partially be a reflection of the

poor support that BDMA receives from addiction educators, with less than 20% endorsing the BDMA as of 2010 (Broadus et al., 2010).

Treatment and Essentialism

A cursory search for studies that examined the interaction between agreement with the BDMA and support for harm reduction initiatives returned a scarcity of published studies. Murphy (2017) identified that holding a "medical-social framework" (e.g., the BDMA) of addiction was predictive of support for a proposition in California that would expand financial resources allocated for the purpose of diverting first- and second-time drug offenders from jail and into treatment. Although Murphy (2017) stated that participants' support of the proposition directly implied willingness to finance the expansion, it is unclear that participants consciously drew the connection between supporting the proposition and paying for it.

Overall, the general public tends to believe those with substance use disorders should be forced into treatment; simultaneously, they disagree with increased funding for treatment. In a 2014 study, Giordano demonstrated that although support for treatment in lieu of incarceration for individuals with drug offenses could be predicted by agreement with the BDMA, no such association was found when examining willingness to fund that treatment. Over half of all participants agreed that treatment is a better approach to manage individuals with low-level drug offenses than incarceration, while simultaneously supporting a reduction in money spent on drug treatment (Giordano, 2014). Timberlake, Lock and Rasinksi (2003) reported that believing addiction is developed secondary to a physiological process in the brain does not predict support for drug control spending in a variety of policies, including drug treatment programs and healthcare services for those

with SUDs. Research by Barry and colleagues (2014) indicated participants were significantly more likely to be opposed to SUDs receiving equivalent insurance benefits compared to other mental health disorders and were significantly more likely to be opposed to increased government spending on treatment for SUDs compared to other mental health disorders.

For individuals with SUDs seeking treatment, agreement with the BDMA is associated with a reduction in a perceived sense of control over their substance use and their ability to change their substance use behaviors (Wiens & Walker, 2014). This effect persists over time rather than representing an initial response (Wiens & Walker, 2014). Individuals who perceive disorders as immutable and biological in nature (essentialism), are significantly more likely to hold stigmatizing beliefs (Howell et al., 2011). As an alternative, Lewis (2018) suggests reinterpreting the neurobiology of the BDMA to include the potential for change after the development of neurobiological addiction. In the current study, I refer to this alternative model as the "Malleability Model" of addiction (MM). Support for this reinterpretation has begun to emerge, as research indicates that exposure to malleability-focused psychoeducation on the neurobiology of mental health disorders can reduce pessimism regarding treatability (Lebowitz et al., 2013), and increase participants' confidence in their ability to effectively respond to depressive symptoms (Lebowitz & Ahn, 2018). This optimism is reflected six weeks after intervention, suggesting lasting impacts (Lebowitz et al., 2015). Zimmerman and colleagues (2020) established that the more an individual internalizes a malleability perspective of their depression, the more likely they are to perceive their symptoms as being shorter in expected duration. Individuals with stronger beliefs consistent with the

MM also endorse lower symptom severity, reduced stigma, and lower psychological

inflexibility (Zimmerman et al., 2020). The MM has also been validated in individuals

with eating disorders, as psychoeducational messages emphasizing malleable biology

resulted in greater prognostic optimism and self-efficacy in recovery than did biological

messages (Farrell et al., 2015). In a similar direction, when employing a biopsychosocial

explanation for the development of obsessive-compulsive disorder (OCD), as opposed to

a strictly biological explanation, individuals endorsing a stronger belief in the

biopsychosocial model reported stronger expectancy that behavioral changes would

reduce their own OCD symptoms (Gershkovich et al., 2018). The current study will be

the first to employ the MM in a substance use context and among the general public,

rather than with individuals targeted for the study due to symptomology.

Current Study

Proponents of the BDMA, including current and previous directors of the NIDA,

have asserted that an understanding of, and agreement with, the biological explanation for

the development of addiction will increase support for advanced public policy, such as

alternatives to incarceration and funding for treatment of substance use disorders (Hall &

Carter, 2013). Research within the last 10 years has identified that increased acceptance

of a biological explanation of addiction and other mental health disorders is associated

with either no decrease in stigma, or an increase in stigmatizing beliefs (Pescosolido et

al., 2010). Stigmatizing attitudes are associated with lower support for harm reduction,

funding for treatment, alternatives to incarceration, insurance parity, and an increase in

support for punitive public policies (Barry et al., 2014; Kennedy-Hendricks, et al., 2017;

Kulesza et al., 2015; Matheson et al., 2014; McGinty et al., 2018; Timberlake et al.,

2003). The lack of positive change in attitudes and stigma following a biological explanation for the development of addiction indicates that wider dissemination of the BDMA may counterintuitively impede treatment expansion and funding for treatment and has the potential to unintentionally reinforce stigmatizing beliefs. Alternative explanatory models that aim to increase public and sociopolitical support have been scarcely researched, as most data on SUD policy has critically evaluated the utility of the BDMA only.

Given the United States is a democratic society, its citizens often engage in behavior such as voting and donating funds to express their policy-relevant values; therefore, this study aimed to address how individuals' values regarding substance use influence voting and donating patterns. For this study, we propose to evaluate the association between agreement with the Malleability Model, and support for harm reduction policies and funding. Specifically, we hypothesize that agreement with the MM will more strongly predict willingness to vote for harm reduction policies than agreement with the BDMA (H1), and that agreement with the MM will more strongly predict willingness to fund harm reduction policies than agreement with BDMA (H2).

CHAPTER II

Method

Participants

Participants were recruited via Amazon Mechanical Turk (MTurk), a means by which to collect research data in an online forum. Collecting data on the Internet reduces sampling bias compared to more traditional methods of data collection (Gosling et al., 2004). The MTurk participant populations are more diverse than other internet populations in a variety of ways, including gender, race, age, and residential region (Buhrmester et al., 2011). Reducing sampling bias by increasing generalizability is important as this study is evaluating the influence of public attitudes on public policy decision-making, which is not an issue constrained to any one demographic but rather the entire country. The project parameters on MTurk were set such that only participants with approval (paid) percentage rate for all surveys completed on MTurk was greater than or equal to 90, were permitted to see and complete the study. The keywords, "survey," "voting," and "drug policy" were included in the study advertisement on MTurk. Participant location was set within the United States and participants had be a minimum of 18 years old, with no upper age limit, as there is no upper age limit to vote in the United States. Upon completion of the study, each participant was compensated $0.75 for their participation.

Upon concluding data collection, 452 participants completed the study. Due to an error in the text entry in the survey of one of the attention check questions, this item was excluded from evaluation of the quality of the data. This resulted in participants being required to pass two of three attention checks, rather than three of four. After excluding

all participants who did not pass the attention checks, a total of 222 participants were included in the analyses.

The participants were primarily 24-30 years old (33%), male (57%), and European American (69%). Most participants had earned a bachelor's degree (53%) and were residing in the southern region of the United States (36%). Eighty-eight percent of the participants perceived the drug use problem, across the country, as a crisis/serious problem. Regarding the drug use problem within their own neighborhood and schools, 58% of participants believed it to be a crisis/serious problem.

Politically, 50% of participants self-identified as Democratic, 27% as Republican, 19% as Independent, and 2% as something else. Of the Republican-identifying participants, 73% considered themselves "strong" Republicans, whereas among those identifying as Democratic, 60% thought of themselves as "strong" Democrats. Those that self-identified as Independent, reported being closer to the Democratic party 75% of the time. Nearly all participants were registered to vote (91%).

Fifteen percent of participants endorsed a personal history of problematic drug use, whereas 19% reported a problematic personal history of alcohol use. Forty-one percent of the participants reported knowing someone else with a problematic history of drug use, and 44% knew someone else with a problematic history of alcohol use. Slightly less than one-third (32%) of participants indicated never having experienced a problematic history of alcohol/drug use, nor knowing anyone else with a problematic history of alcohol/drug use. See Appendix A for full demographics distributions.

Procedures

Once participants selected the study on MTurk, they were linked to Qualtrics to complete the study. After reviewing the purpose of the study and risks and benefits of participation, they electronically signed a consent form. Participants first read a brief paragraph about the MM, BDMA, and the Moral Weakness Model (MWM) and rated their agreement with each model on a 5-point Likert-type scale, ranging from "strongly disagree" to "strongly agree" (Ricardo et al., 2020). The models were counterbalanced across participants. See Appendix B for the statements participants read about the models. The MWM was included in the current study as previous qualitative literature on attitudes towards substance use have indicated that participants report endorsing themes related to morality. Specifically, individuals consistently discuss beliefs that substance use occurs in those with bad morals and poor decision making, and thus are responsible for their own circumstances and addiction (Meurk et al., 2013; Meurk et al., 2014; Meurk et al., 2016). Given the frequency at which these ideas are reported in discussions about the attribution of substance use, the MWM was included as a model endorsement option. After rating the various model endorsements, participants then responded to a series of questions that evaluate their degree of stigmatizing beliefs associated with individuals with SUDs. These questions have been modeled after similar questions used in previous research (Pescosolido et al., 2010; Ricardo et al., 2020).

Participants were then presented with a series of 10 questions aimed to assess each person's willingness to vote for the implementation of substance use harm reduction initiatives within their state, as well as punitive policies in response to substance use within their state. Each question was dichotomized with "yes," and "no," options to

mimic that of a voter ballot. These questions were counterbalanced across participants. See Appendix C for an example of these voter ballot questions. Following this, participants were informed that for the next portion of the study, they were to select where they would "donate" $100 in hypothetical money. They were instructed to "donate" the entire $100 to any of the initiatives or programs of their choosing given the options provided, using $10 increments. Participants were informed they had complete control over where the $100 is "donated," and that as much or as little of the $100 can be "donated" to any initiatives or programs, as long as it is in $10 increments (i.e., $10, $20, $30…). There were 10 possible "donation" options, ranging from harm reduction policies to punitive policies in response to substance use. Needle exchanges, supervised injection sites, opioid replacement therapy, heroin maintenance, and Narcan access for the public are the five harm-reduction donation options. Mandatory incarceration for all drug convictions, enforcement of all drug convictions as felonies, capital punishment for possession with intent to distribute, capital punishment for drug manufacturing, and elimination of insurance benefits for drug treatment were the five punitive donation options, and were modeled after proposed federal policy changes (Office of the Attorney General, 2017, 2018a, 2018b).

Throughout the study, participants responded to attention check items embedded within survey items, such as, "The sun rotates around the earth," as well as an instructional attention check. Please see Appendix D for the instructional attention check. These attention checks follow the standard set forth by Kees and colleagues (2017) to ensure the quality of the data. Although all participants were paid for the completion of the study, only data from participants that could correctly answer at least

three of the four attention check items were intended to be included in the analyses. As noted previously, due to a text entry on the survey for one of the attention check items, this question was excluded, and participants were required to pass correctly answer two of the remaining three questions.

Lastly, participants were asked to complete basic demographic questions, including age, gender, race, residential region, highest level of education, and the extent of their own personal experience with substance use. They were also asked to provide information on the political party with which they identified, as well as whether they were a registered voter, and their perception of the substance use problem both within their residential area and across the country. At completion of the study, participants were prompted to enter a unique code on Qualtrics before they were linked back to MTurk where they entered the same unique code to verify their completion of the study before payment was authorized, as suggested by Burhmester (2018).

Measures

The demographic information collected for this study asked participants to identify their age, as well as the gender with which they identify. Gender responses included "male," "female," "non-binary," and "prefer not to answer." Participants also selected the race(s)/ethnicity(ies) with which they identify. The response options provided to participants mirrored that of the United State Census Bureau and include "White/European," "Black or African American," "Native American or Alaskan Native," "Asian American," "Hawaiian or other Pacific Islander," (United States Census Bureau, 2010) and also included options of "Hispanic or Latinx" and "two or more races." Participants were asked their current residential region, with response options mirroring

that of the United States Census Bureau's four-region breakdown: Northeast, Midwest, South, and West (United States Census Bureau, 2017). Participants were asked to report their highest level of educational attainment, consistent with the United States Census Bureau (2019), and were provided the following options: less than high school, high school graduate, some college/no degree/technical degree, associate's degree, bachelor's degree, master's degree, doctoral degree.

To evaluate participants' degree of personal exposure to problematic substance use, they were asked to select from the following multiple-choice options: "I personally have a history of problematic drug use," "I personally have a history of problematic alcohol use," "I know someone personally who has a history of problematic drug use," "I know someone personally who has a history of problematic alcohol use," and "none of the above." To evaluate the degree to which participants perceive drug use as a problem both broadly and in their residential area, they were asked, "How would you describe the problem of drug use across the country" and "in your neighborhood and schools" separately, and responded by selecting one of the following answers for each question: "crisis," "serious problem," "minor problem/not a problem," and "don't know," modeled after Pew Research Center (2014). At the conclusion of the study, participants were prompted to report how they identify politically, by asking "Generally speaking, do you usually think of yourself as a Republican, a Democrat, an Independent, or something else?" If they select either Republican or Democrat, they were prompted, "Would you call yourself a strong (party affiliation) or a not very strong (party affiliation)." Should they select, "Independent," they were asked, "Do you think of yourself as closer to the Republican or Democratic party?" These questions are modeled after The American

National Election Studies, and Harvard University's Cooperative Congressional Election

Study (see Ramseyer & Rasmusen, 2016).

CHAPTER III

Results

Age, education, gender, residential region, race, political affiliation, voter

registration, perception of the problem, and personal/other experiences with problematic

alcohol and drug use were evaluated as potential covariates. Based on preliminary

inspection of the data, education was collapsed from seven to three groups (less than high

school/high school, undergraduate, graduate), and perception of the problem was

collapsed from four categories to two (crisis/serious problem, minor problem/don't

know). With the exception of perception of the problem, which was treated as

continuous, all other covariates were categorical in nature; therefore, they were dummy

coded prior to conducting any analyses. Overall, individuals endorsed the BDMA to a

greater extent ($M = 4.05$, $SD = 1.00$) than the Malleability Model ($M = 3.81$, $SD = 1.00$),

and the Moral Weakness Model ($M = 2.94$, $SD = 1.40$).

To evaluate the degree of associations between the covariates and the outcome

variables (votes and donations to various policies), correlations were conducted among

the potential covariates to assess whether any were equal to or exceeded a correlation of r

$= 0.3$ (moderate relationship). Any exceeding this threshold were included in the models

testing H1 and H2. The only covariate that exceeded this threshold was identification

with the Republican party; therefore, it was included as a covariate in all subsequent

models. Affiliation with the Republican party was positively correlated with total

punitive policy votes, $r = .42$, $p < .01$, total punitive policy donations, $r = .33$, $p < .01$,

and total harm reduction policy donations, $r = .33$, $p < .01$.

Participants voted for harm reduction policies ($M = 3.64$, $SD = 1.36$) significantly more often than punitive policies ($M = 1.59$, $SD = 1.75$), $t(221) = 39.70$, $p < .001$, $d = 1.30$. Similarly, participants donated to harm reduction policies ($M = 74.44$, $SD = 28.58$) significantly more often than punitive policies ($M = 25.56$, $SD = 28.58$), $t(219) = 38.64$, $p < .001$, $d = 1.71$.

Hypothesis 1:

Total harm reduction policy votes were summed and are represented on a scale of 0-5 ($M = 3.64$, $SD = 1.36$). To evaluate the influence of addiction model endorsement on harm reduction votes, I conducted a negative binomial regression analysis. Endorsement of the moral weakness model (MWM), the brain disease model of addiction (BDMA), and the malleability model (MM), and affiliation with the Republican party served as the predictor variables. Total votes for harm reduction policies served as the criterion variable. The Omnibus Test results provide a test of the overall model and is reported as a Chi-Square value. Where there is a significant Chi-Square value, we used the Wald Chi-Square values within the parameter estimates to evaluate the strength and direction of the association between individual outcomes and the criterion variable.

The results of the regression analysis indicated the overall model was non-significant $X^2 (13) = 4.64$, $p = .98$, suggesting that the predictors variables were not significantly associated with harm reduction votes.

Total punitive policy votes were summed and are represented on a scale of 0-5 ($M = 1.59$, $SD = 1.75$). To evaluate the influence of addiction model endorsement on punitive policy votes, we conducted a negative binomial regression analysis. MWM,

BDMA, MM, and Republican party affiliation served as the predictor variables. Total votes for punitive policies served as the criterion variable.

The results of the regression analysis indicated that the predictors as a whole were associated with voting for punitive policies, X^2 (13) = 90.50, $p < .001$, indicating that the predictor variables were significantly associated with punitive policy votes. Results of the regression model are presented in table 1. Strongly disagreeing with the BDMA was significantly associated with an increase in punitive policy votes (X^2 (1) = 3.73, $p = .05$, B = 1.10). Strongly (X^2 (1) = 28.96, $p < .01$, B = -2.17) to slightly (X^2 (1) = 14.43, $p < .01$, B = -1.24) disagreeing with the MWM were significantly associated with a decrease in punitive policy votes. Additionally, endorsing less affiliation with the Republican party was significantly associated with a decrease in punitive policy votes (B = -.750, $p < .01$).

Table 1

Regression Analysis Summary of Addiction Model and Republican Affiliation Predicting Punitive Policy Votes

Variable	B	Wald X^2	p
Intercept	1.05	9.70	.00
BDMA Strongly Disagree	1.10	3.72	.05
BDMA Slightly Disagree	-.42	1.13	.29
BDMA Neutral	.37	.60	.44
BDMA Slightly Agree	.13	.30	.58

(continued)

Variable	B	Wald X^2	p
BDMA Strongly Agree (Constant)	0^a	.	.
MWM Strongly Disagree	-2.17	28.95	.00
MWM Slightly Disagree	-1.24	14.43	.00
MWM Neutral	-.27	.78	.38
MWM Slightly Agree	-.07	.07	.80
MWM Strongly Agree (Constant)	0^a	.	.
MM Strongly Disagree	-.79	.99	.32
MM Slightly Disagree	.40	1.08	.30
MM Neutral	.43	1.78	.18
MM Slightly Agree	.32	1.48	.22
MM Strongly Agree	0^a	.	.
Not-Republican	-.75	13.26	.00
Republican	0^a	.	.

[a] Set to zero because this parameter is redundant

Hypothesis 2:

     Total harm reduction policy donations were summed and are represented on a scale of 0-100 ($M = 74.44$, $SD = 28.58$). Total punitive policy donations were summed and are represented on a scale of 0-100 ($M = 25.56$, $SD = 28.58$). We evaluated the influence of addiction model endorsement on placement of donated funds among harm reduction and punitive policy options. Endorsement of the MWM, BDMA, MM, and affiliation with the Republican party served as the predictor variables. Total donations for harm reduction and punitive policies were summed separately and served as the criterion variables. Because placement of donated funds for harm reduction policies perfectly predicted placement of donated funds for punitive policies ($r = 1.00$), the models were identical to one another, with opposite positive and negative values; therefore, one model accounts for both criterion variables.

     The overall model was significant, $F (4, 211) = 23.84$, $p < .01$, $R^2 = .32$, indicating that model endorsement and political affiliation accounted for a significant proportion of variance in the criterion variable. Results of the regression model are presented in Table 2. Endorsement of the MWM added significantly to the prediction, accounting for 16% of the variance ($r^2_{sp} = -.40$, $p < .01$), such that as endorsement of MWM increases by 1, total harm reduction donations decreases by \$8.77 ($B = -8.77$). Affiliation with the Republican party was significantly predictive of placement of donated funds, accounting for 5.30% of the variance ($r^2_{sp} = -.23$, $p < .01$), such that being a member of the Republican party decreased donations to harm reduction policies by \$14.93 ($B = -14.93$). Finally, endorsement of the BDMA accounted for 1.40% of the

variance (r^2_{sp} = .12, p = .038). As endorsements of the BDMA increase by 1, donations

to harm reduction policies increase by $3.53 ($B$ = 3.53).

Table 2

Regression Analysis of Model and Republican Affiliation Predicting Placement of

Donations

Variable	B	95% CI	β	t	p	r^2_{sp}
(Constant)	93.11	[72.70, 113.52]	.	8.99	.00	.
Republican Affiliation	-14.93	[-22.25, -7.61]	-.23	-4.02	.00	-.29
BDMA	3.53	[.19, 6.88]	.12	2.09	.04	.12
MWM	-8.77	[-11.18, -6.35]	-.43	-7.15	.00	-.41
MM	-.75	[-3.98, 2.48]	-.03	-.46	.65	-.03

To evaluate the possibility that significant interaction between addiction model
endorsement and harm reduction votes and donations was driven by the two policy options
that included the term "therapy" (medication assisted therapy, heroin assisted therapy),
total votes and donations for these "therapy" options were summed separately and
correlated with model endorsements. No correlation coefficients were r = 0.3 or above;
therefore, it was concluded that these specific "therapy" policies were not influence the
relation between model endorsement and harm reduction votes and donations.

CHAPTER IV

Discussion

I examined whether agreement with an alternative explanatory model for the development of addiction, the Malleability Model, could predict support for harm reduction policies via voting and donation-based funding. With respect to harm reduction policy votes, neither model endorsement nor political affiliation were associated with total harm reduction votes; however, strong disagreement with the BDMA was associated with an increase in punitive policy votes, while slight to strong disagreement with the MWM predicted decreases in punitive policy votes. Less affiliation with the Republican party also predicted a decrease in punitive policy votes. Regarding harm reduction and punitive policy donations, increases in endorsement of the MWM as well as affiliation with the Republican party were associated with a reduction in donations to harm reduction policies. Endorsement of the BDMA was associated with a small increase in donations to harm reduction policies.

Notably, the alternative model proposed in this study failed to predict placement of any funds or donations. This study was the first to introduce the MM into the context of addiction to alcohol and drugs. Previous literature has evaluated its utility for the purpose of explaining less stigmatized disorders, such as depression and eating disorders. These studies also employed a mixture of media platforms to provide detailed explanations of the MM. For instance, Lebowitz and colleagues (2015) had participants watch a 7-minute video detailing the model, and in an effort to deepen comprehension of the model, asked participants to write a "short letter to a depressed individual, using information from the video they watched, to persuade the person to see depression 'in a

new light'" (pg. 4). Farrell and colleagues (2015) provided their participants with a video describing the MM before having them answer a series of questions about the video they watched. For the purposes of the current study, participants only read a brief paragraph highlighting the important points of the model before endorsing their degree of agreement. As such, participants had less detailed information and needed to strictly rely on their reading comprehension. Although it limits the ability to compare results of this study with previous literature that used more information across multiple platforms, it is a more ecologically valid means of evaluating the utility of the model be providing a concise paragraph of information, such as might be found on a voter ballot.

This was also the first study to evaluate the utility of this explanation in the general public, rather than strictly to an audience with a specific disorder. The US is considered an individualistic society, with values placed on personal success and achievement above that of the larger group or society (Pokhrel et al., 2018). Individualistic orientation may partially account for the success of this model on a personal level with participants that are themselves symptomatic, and its failure at a broader cultural level that would rely on empathy and perspective-taking. Citizens of individualistic rather than collectivistic societies tend to score lower on measures of empathic concern for others (Chopik et al., 2016). Similarly, although participants voted for and donated to harm reduction policies significantly more often than punitive policies, this appeared to be related to a general aversion to punitive policies rather than attraction to, and agreement with, harm reduction policies. For example, across all possible covariates and model endorsements, agreement with the BDMA was the only variable positively associated with harm reduction donations, and no variables were associated

with an increase in harm reduction votes. Instead, all significant interactions associated

with voting behavior were related to punitive policy votes, and the remaining significant

interactions associated with donating behavior were negatively correlated with harm

reduction policies. These patterns would suggest that our participants may have only

endorsed harm reduction policy votes and donation options out of avoidance of endorsing

punitive policies and may not freely vote for or donate to these harm reduction policies in

the real world if there is not an aversive alternative presented as a dichotomy.

Of the possible demographic variables, political affiliation with the Republican

party was the only covariate to emerge as being significantly associated with the outcome

variables. This is consistent with previous literature indicating that political affiliation is

more predictive of individual values than other demographic variables, such as age,

gender, or race (Sheldon & Nichols, 2009). This is likely due to political affiliation being

a complex and multidimensional representation of a set of personal beliefs and values,

rather than a single perspective (Sheldon & Nichols, 2009). Notably, the exact same

interactions between Republican party affiliation and the outcome variables was observed

between endorsement of the MWM and outcome variables. That is, as Republican

affiliation decreased, as did votes for punitive policies and as agreement with the MWM

decreased, as did votes for punitive policies. Again, as Republican affiliation and MWM

endorsement increased, donations to harm reduction policies decreased. Endorsement of

the MWM and holding Republican political values have some similarities that can

account for both endorsements following exactly the same interaction patterns. The

defining features of the MWM are the beliefs that individuals are solely responsible for

their circumstances due to their moral compass, and as such, should be held accountable

for any decisions they make, both good and bad (Meurk et al., 2014). By this account, persons with substance use disorders are seen as morally weak and blame is attributed to the individual for their inability to improve their life circumstances (Meurk et al., 2013; Meurk et al., 2014; Meurk et al., 2016). Generally speaking, individuals identifying with the Republican party make more internal and controllable attributions for others' misfortune and need for help, and are subsequently more punitive, as demonstrated by greater willingness to withhold help as a form of punishment for violating societal standards compared to their more liberal counterparts (Skitka & Tetlock, 1993; Skitka, 1999). Additionally, affiliation with the Republican party has been linked to higher extrinsic value orientations, including a greater likelihood of aggressiveness towards others, and lower values in helping others (Sheldon & Nichols, 2009). Taken together, it is likely that the underlying value that drives the consistency of the interactions between these two variables and the outcome measures is the internal attribution of responsibility and blameworthiness assigned to the individual with substance use disorders.

Although the MM failed to predict placement of votes and donations for various harm reduction and punitive policies, it is both surprising and promising that higher endorsement of the BDMA was associated with greater donations to harm reduction policies. This finding was unexpected given the body of research indicating the essentialism perspectives across various disorders is associated with treatment pessimism (Wiens & Walker, 2014), stigmatizing beliefs (Howell et al., 2011), and most importantly, a reduction in support for treatment funding expansion (Barry et al., 2014; Giordano, 2014). This study is the first to evaluate willingness to fund harm reduction and punitive policies on an individual-level, rather than state or federal-level. This

difference may account for these disparate findings, as individuals generally tend to provide little support for increased governmental spending on substance use treatment and insurance coverage irrespective of substance use model endorsement (Barry et al., 2014; McGinty et al., 2018). Thus, it is possible that on an individual-level, citizens are more likely to provide support via small monetary donations than through voter support for large federal or state spending increases to address substance use disorders, explaining why the BDMA only predicted donation but not voter support for harm reduction policies.

Limitations and Future Directions

The means by which the current study presented the MM to participants was considerably different than previous studies that have validated its use. In particular, it only used a short paragraph to describe the model, rather than a several minute-long video, among other mediums. It is possible that if such a platform had been utilized, participants may have been more actively engaged and comprehended the information on a deeper level, possibly endorsing it to a greater extent. Because of the brevity of the model presentations, it is also likely that participants may not have readily understood the difference between the MM and the BDMA, as the differences could be considered nuanced to a layperson.

The current study did not discuss the treatability of substance use disorders. Previous studies have indicated that substance use treatment seeking individuals are perceived as less blameworthy in some contexts (Macdonald et at., 1999; Monterosso et al., 2005). As discussed at length, blame attribution is a pivotal issue with respect to substance use disorders, as well as personal values that guide political affiliation and

subsequent voting and donating behavior. When an individual with a history of substance use disorder is presented as rehabilitated (e.g., sober), those that identify with the Republican party are actually more willing to help this individual than those that do not identify with this party (Skitka & Tetlock, 1993), suggesting a means by which to increase empathic responses within individuals most likely to be punitive towards those with SUDs. Future research should consider presenting both the treatability of SUDs and a vignette of a rehabilitated individual with a history of SUDs, when evaluating ways of increasing voter support for alternatives to incarceration.

Participants were recruited for this study via the online platform, MTurk. By nature of the survey recruitment occurring online, this introduces bias into the participant pool, as individuals must have the means to access the survey first, by having access to a computer, second, by having stable internet connection, and third, having the knowledge and understanding of technology to be able to effectively engage in online survey taking. Unsurprisingly, this likely led to the overrepresentation of college-educated participants in the current study, as 53% of participants endorsed earning at least bachelor's degree. According the US Census Bureau (2018), only 31.5% of the population of the US have earned a bachelor's degree or higher, limiting the generalizability of the current results.

Several of the harm reduction policies employed in this study do not come without significant controversy and political push-back in regions that have attempted to adopt such programming (Gartry et al., 2009). Considering the hotly debated nature of the harm reduction policies provided here, future research may consider incorporating less contentious policies to gain support for alternatives to incarceration, as the current

policies unto themselves may account for some overall lack of enthusiasm for harm reduction in the present study.

Unexpectedly, endorsement of the BDMA was positively associated with funds donated to harm reduction policies. As discussed above, this finding may be representative of willingness to personally provide financial support by means of small donations as an alternative to voting for governmental expansion of treatment funding. It is worthwhile for future research to attempt to verify the veracity of this finding through replication and explore means by which to extrapolate this finding in meaningful way that influences policy change.

Conclusion

In summary, this research indicates that the MM is not, in the form presented in the current study, an effective alternative to the BDMA as it relates to increasing political and financial support for alternatives to incarceration in a voting and donating paradigm. Overall, agreement with the BDMA could effectively predict increases in donations to, but not votes for, harm reduction policies. Agreement with the MWM and affiliation with the Republican party could readily predict more punitive approaches to voting and donating.

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APPENDIX A

Demographics Table

Demographic Variables

Variable	*N*	*%*
Gender		
Female	89	40.1
Male	126	56.8
Non-binary	2	.9
Missing	5	2.3
Age	*N*	*%*
18-23	13	5.9
24-30	71	32.0
31-40	60	27.0
41-50	35	15.8
51-60	25	11.3
61-70+	13	5.9
Missing	5	2.3
Education	*N*	*%*
High school/GED	21	9.5
Some college/trade/vocational	30	13.5
Associates degree	16	7.2
Bachelors degree	116	52.3
Graduate degree	34	15.3

Missing	5	2.3
Race	*N*	**%**
Native American/Alaskan Native	11	5
Asian American/Native Hawaiian/Pacific Islander	15	6.8
Black/African American	26	11.7
Latinx/Hispanic	12	5.4
White/Caucasian	150	67.6
Two or more races	1	.5
Other	2	.9
Missing	5	2.3
Residential Region	*N*	**%**
North East	38	17.1
Midwest	41	18.5
South	79	35.6
West	59	26.6
Missing	5	2.3
Problem of Drug Use Across the Country	*N*	**%**
Crisis	58	26.1
Serious Problem	138	62.2
Minor Problem/Not a Problem	16	7.2

	N	%
Don't Know	4	1.8
Missing	6	2.7
Problem of Drug Use in Neighborhood/Schools	*N*	**%**
Crisis	26	11.7
Serious Problem	100	45.0
Minor Problem/Not a Problem	68	30.6
Don't Know	22	9.9
Missing	6	2.7
Political Affiliation	*N*	**%**
Republican	60	27.0
Strong Republican	44	19.8
Not Strong Republican	16	7.2
Democrat	110	49.5
Strong Democrat	66	29.7
Not Strong Democrat	19.8	19.8
Independent	42	19.4
Independent/Republican	1	.5
Independent/Democrat	3	1.4
Something Else	4	1.8
Missing	6	2.7
Voter Registration	*N*	**%**
Registered	203	91.4

	N	%
Not Registered	13	5.9
Missing	6	2.7
Experience with Substance Use	*N*	*%*
Personal Experience/Drugs	34	15.3
Personal Experience/Alcohol	42	18.9
Other's Experience/Drugs	92	41.4
Other's Experience/Alcohol	97	43.7
None of the Above	72	32.4
Missing	0	0

APPENDIX B

Model Endorsement Statements

Brain Disease Model Statement

One view of drug addiction is that it is different from social use and is caused by changes in the brain that make it difficult to stop using drugs, even when bad things happen due to drug use. These changes also interfere with someone's ability to stay sober for long periods of time. This view considers drug addiction to be a brain disease.

Moral Weakness Model Statement

One view of addiction is that it happens because people have bad morals, make bad decisions, and make the choice to continue using. They are at fault for their situation and are responsible for their addiction. This view suggests that even if someone is physically dependent on drugs, they are at fault because they decided to start using drugs and they can make the decision to stop at any time.

Malleability Model Statement

One view of addiction is that it happens due to a combination of factors influencing the brain and the body. These factors include genes that can be "turned on" or "turned off" by the environment and personal experiences. For instance, not getting enough sunlight can change brain chemistry. This view suggests that biology can influence someone's chance of developing an addiction, but those factors are changeable and addiction does not have to be permanent.

APPENDIX C

Ballot Voting Examples

Harm Reduction

Needle Exchange Programs provide access to sterile needles and syringes free of cost and facilitate safe disposal of used needles and syringes for all that use needles and syringes, including those that use injection drugs. The purpose of these programs is to reduce the rates of infectious diseases such as HIV and Hepatitis B.

Do you approve of your state opening a Needle Exchange Program? Please cast your vote "yes" or "no."

☐ Yes

☐ No

Punitive

Some believe that if you impose the death penalty for a drug charge of Possession with Intent to Distribute, drug dealers will be less likely to possess and sell drugs, reducing drug use and crime.

Do you approve of your state imposing the death penalty for a drug charge of Possession with Intent to Distribute? Please cast your vote "yes" or "no."

☐ Yes

☐ No

APPENDIX D

Instructional Attention Check

Research shows that people, when answering questions, prefer not to pay attention and minimize their effort as much as possible. If you are reading this question, please select "none of the above" on the next question

What was this study about?

☐ Voting

☐ Drug addiction

☐ Donations

☐ None of the above

VITA

_____

Mia M. Ricardo, M.A.
Sam Houston State University
Department of Psychology and Philosophy
Huntsville, TX 77340

EDUCATION

Candidate	**Doctor of Philosophy (Clinical Psychology, Forensic Emphasis)**
	Sam Houston State University, Huntsville, Texas
	Dissertation: Increasing Support for Alternatives to Incarceration for Drug Use: Is the Brain Disease Model of Addiction Effective?
	Chair: Craig E. Henderson, Ph.D.
	Final Defense: 08/17/2020
	Grant-funded: APA Div. 50 Student Research Grant Award – $450
2017	**Master of Arts (Clinical Psychology)**
	Sam Houston State University, Huntsville, Texas
	Thesis: The Effect of the Brain Disease Model of Addiction on Juror Perceptions of Culpability
	Chair: Craig E. Henderson, Ph.D.
2015	**Bachelor of Arts (Psychology)**
	University of Southern Maine, Portland, Maine
2013	**Associate of Applied Sciences (Behavioral Health & Human Services)**
	Southern Maine Community College, South Portland, Maine

STUDENT CLINICAL EXPERIENCE

8/2020 – Present	**Harris County Juvenile Probation Department Forensic Unit –** Houston, TX
	Practicum Student
Population:	Justice-involved adolescents detained at the Harris Detention Center, in the community while on probation, and in the community pre-adjudication.

Supervisors: (clinical)	Nichole Dorsey, Ph.D., Uche Chibueze, Psy.D., ABPP

8/2019 – Present	**Team Forensic Services** – Huntsville, TX Student Clinician and Co-therapist
Population:	Primarily low-income, rural, multi-ethnic adult males on probation or parole for sexual offenses
Supervisor:	Holly Miller, Ph.D., LSOTP

7/2019 – 6/2020	**Harris County Psychiatric Center** The University of Texas Health Science Center – Houston, TX Student Clinician and Co-Therapist
Population:	Adult in inpatient care for those with severe mental illness, hospitalized for voluntary commitment, involuntary commitment, and competency restoration. Justice-involved, mentally ill youth placed in a mental health treatment setting in lieu of incarceration.
Supervisors:	Elaheh Ashtari, Psy.D., Alia Warner, Ph.D., Kendra Anderson, Ph.D.

6/2018 – 7/2019	**Rebecca J. Hamlin, Ph.D. (private practice)** – Spring, TX Student Clinician and Co-Therapist
Population:	Ethnically and diagnostically diverse outpatient clients, children, teens, adults, couples, and family co-therapy
Supervisor:	Rebecca J. Hamlin, Ph.D.

6/2018 – 9/2018	**Walker County Adult Probation** – Huntsville, TX Student Clinician
Population:	Ethnically diverse, male and female, adults on probation for felony and misdemeanor charges in multiple rural counties
Supervisor:	Wendy Elliott, Ph.D., ABPP (forensic)

8/2017 – Present	**Psychological Services Center** Sam Houston State University – Huntsville, TX Assistant Forensic Evaluator
Population:	Ethnically diverse, male and female, adults and adolescents involved in the justice system in multiple rural counties; evaluations conducted in jails, outpatient clinics, and remotely via videoconferencing technology
Supervisors:	Mary Alice Conroy, Ph.D., ABPP (forensic), Wendy Elliott, Ph.D., ABPP (forensic), Darryl Johnson, Ph.D.

8/2017 – 12/2018	**Psychological Services Center**

Sam Houston State University – Huntsville, TX
Student Clinician

Population: Diverse, low-income, multi-ethnic population of children, adolescents, families and adults with diagnoses including serious mental illness, substance use history, mood disorders, personality disorders, family, and academic stress

Supervisors: Darryl Johnson, Ph.D., Craig Henderson, Ph.D., Chelsea Ratcliff, Ph.D.

1/2017 – 5/2017 **Bureau of Prisons – Federal Detention Center** – Houston, TX
Master's Practicum Student

Population: Ethnically diverse incarcerated male and female adults from the United States and Mexico

Supervisor: Daniel J. Fox, Ph.D.

8/2016 – 12/2016 **Texas Department of Criminal Justice – Ferguson Unit**
University of Texas Medical Branch – Midway, TX
Master's Practicum Student

Population: Ethnically diverse incarcerated male and female adults
Supervisor: Sheri Nichols, LPC-S

NON-PRACTICUM CLINICAL EXPERIENCE

10/2016 – present **Applied Psychology Services, PLLC** – The Woodlands, TX
Psychological Technician

6/2018 – 6/2019 **HOPE Group Co-Therapist/Researcher**
Montgomery County Adult Probation – Conroe, TX

5/2016 – 08/2016 **Management and Training Corporation – Hamilton Unit**
Texas Department of Criminal Justice –Bryan, TX
Licensed Chemical Dependency Counselor

1/2013 – 8/2015 **Day One, Inc**. – South Portland, ME
Licensed Alcohol and Drug Counselor

PUBLICATIONS, PERIODICALS & BOOK CHAPTERS

Christensen, M. R., Anderson-White, A., Ryan, L. J., **Ricardo, M. M.,** Krembuszewski, B. A., Sze, C. & Henderson, C. E. (in press). Substance Use Disorders. In Venta, A., Sharp, C., Fonagy, P. & Fletcher, J. (Eds.). *Developmental Psychopathology.* Hoboken, NJ: Wiley-Blackwell.

Ricardo, M. M. & Henderson, C. E. (2021). The Effect of the Brain Disease Model of Addiction on Juror Perceptions of Culpability. *Translational Issues in Psychological Science.* http://doi.org/10.1037/tps0000237

Ricardo, M. M. & Kurus, S. J. (2021). Kahler v. Kansas: A New Challenge to the Insanity Defense. *Texas Psychologist, 79*(3), 20-22.

Reinhard, E., Trupp, G., **Ricardo, M. M.** & Johnson, D. (2020). Competent to Work from Home? Forensic Evaluations in the Midst of a Global Pandemic. *Texas Psychologist, 79* (2), 8-10.

Ricardo, M. M. (2020; Invited Article). Solving Supervisory Snags in Secure Settings. *The Gavel.* *https://www.apadivisions.org/division18/publications/newsletters/gavel/2020/05/advice-for-interns*

Ratcliff, C.G., Deavers, F.E., Tullos, E.A., **Ricardo, M. M.,** Christensen, M., Dindo, L., Cully, J. A. (2020). Brief behavioral intervention for distressed patients undergoing cancer surgery: A case series. *Cognitive and Behavioral Practice, 27(3), 306-320.* http://doi.org/10.1016/j.cbpra.2020.02.002

Ricardo, M. M., Henderson, C. E., & Christensen, M. R. (2020). The Opioid Crisis and the Brain Disease Model of Addiction: Is the Science Sufficient for Public Support? *Counselor, 20* (4), 22-26. https://www.counselormagazine.com/en/article/the-opioid-crisis-and-the-disease-model-of-addiction-is-science-sufficient-for-public-support

Ricardo, M. M., Henderson, C. E., & Christensen, M. R. (2018). Impact of the Brain Disease Model of Addiction: The Opioid Crisis, Public Policy, and Incarceration. *Texas Psychologist, 77* (4)*, 7-10.*

CONFERENCE PAPER AND POSTER PRESENTATIONS

Ricardo, M. M., Boccaccini, M. T., Gardner, B. O., Murrie, D. C. & Torres, A. N. (2021). Association Between Formal Forensic Training and Adherence to Governing Laws and Professional Guidelines in Sanity Reports. *Poster to be presented at the annual convention of the American Psychology – Law Society, Virtual.*

Ricardo, M. M. & Henderson, C. E. (2020). Drug Policy: Harm Reduction, Punitive Policies, and Capital Punishment in a Voting Paradigm. *Poster presented at the annual convention of the Texas Psychological Association, Virtual.*

Ricardo, M. M., Boccaccini, M. T., Gardner, B. O., Torres, A. N. & Murrie, D. C. (2020). Association Between Formal Forensic Training and Adherence to

Statutory Requirements in Competency to Stand Trial Reports. *Poster presented at the annual convention of the American Psychology – Law Society, New Orleans, LA.*

Engelken, C., Boland, G., **Ricardo, M. M.** & Salami, T. (2019). An Exploration of Gender as a Moderator in the Relationship Between Supervisor Support and PTSD in Law Enforcement. *Poster presented at the annual convention of the Texas Psychological Association, San Antonio, TX.*

Ricardo, M. M., Henderson, C. E., Anderson-White, E., Christensen, M. R., Krembuszewski, B. & Kurus, S. J. (2019) Assumptions of Defendant Identity at the Intersection of Crime and Substance Use. *Poster presented at the annual convention of the American Psychological Association, Chicago, IL.*

Ratcliff, C. G., Tullos, E., Deavers, F., **Ricardo, M. M.,** Christensen, M., Dindo, L., Cully, J. (2019). Development and Pilot Test of a Brief Behavioral Intervention for Distressed Patients Undergoing Surgery for Gastrointestinal Cancer. *Poster presented at the annual meeting of the American Psychosomatic Society, Vancouver, BC.*

Formon, D. L., Harmon, J., **Ricardo, M. M.,** Henderson, C., & Johnson, D. (2019). Effectiveness of Positive Psychology on a Substance-Abusing Probation Population. *Paper presented at the annual convention of the American Psychology – Law Society, Portland, OR.*

Ricardo, M. M., Henderson, C. E., & Christensen, M. R. (2018). Public Perceptions on the Development of Addiction: Brain Disease Model versus Moral Weakness Model. *Poster presented at the annual convention of the Texas Psychological Association, Frisco, TX.*

Ricardo, M. M., Henderson, C. E. & Christensen, M. R. (2018). The Effect of the Brain Disease Model of Addiction (BDMA) on Juror Perceptions of Culpability: Covariates of Endorsement, BDMA Education, and Race. *Poster presented at the annual convention of the American Psychology – Law Society, Memphis, TN.*

Figueroa, M. M. & Henderson, C. E. (2017). The Effect of the Brain Disease Model of Addiction on Juror Perceptions of Culpability. *Paper presented at the annual convention of the Texas Psychological Association, Houston, TX.*

Henderson, C. E., Yenne, E., Sledd, M., Schiafo, M., Mena, C., **Figueroa, M. M.,** Missimo, C., Goodson, A. & Langemeier, D. (2016). Don't Drink and Exercise: New Research On Exercise and Alcohol Use Among College Students. *Symposium conducted at the annual convention of the Texas Psychological Association, Austin, TX.*

Falgout, R., Goodson, A., Mena, C., Manning, J. A., Yenne, E. M., Schiafo, M., Sledd, M., **Figueroa, M. M.**, Missimo, C., Langemeire, D. A., Henderson, C. (2016). Drinking and Physical Activity. *Poster presented at the annual Sam Houston State University Undergraduate Research Symposium, Huntsville, TX.*

Ricardo, M., Magyar, M., Abate, A. C., Camins, J., & Edens, J. (2016). Personality Assessment Inventory-Adolescent (PAI-A) Substance Use-Related Scales' Predictive Validity Within A Justice Involved Youth Sample. *Paper presented at the annual convention of the American Psychology – Law Society, Atlanta, GA.*

Abate, A. C., Magyar, M., Ball, E., **Ricardo, M.,** Hart, J., & Edens, J. (2016). Use of the Personality Assessment Inventory-Adolescent to Assess Trauma-Related Symptoms In Justice-Involved Youth. *Paper presented at the annual convention of the American Psychology – Law Society, Atlanta, GA.*

MANUSCRIPTS UNDER REVIEW

Trupp, G., **Ricardo, M. M.**, Boccaccini, M. T. & Murrie, D. C. Forensic Evaluators' Opinions on the use of Videoconferencing Technology for Competency to Stand Trial Evaluations After the Onset of COVID-19.

Vella, E. J. & **Ricardo, M. M.** Predictors of Cardiovascular Reactivity to the Trier Social Stress Test: Public Self-Consciousness and Gender.

MANUSCRIPTS IN PROGRESS

Henderson, C.E., **Ricardo, M. M.** & Dakof, G. Sustainability of Evidence Based Practices in Community Behavioral Health Settings; The Multidimensional Family Therapy (MDFT) Experience.

FEATURES

The Addictions Newsletter, American Psychological Association, Division 50, Society of Addiction Psychology. Fall 2020 Issue. https://www.addictionpsychology.org/soap-box/2020/fall/show-and-tell

RESEARCH EXPERIENCE

8/2017 – present	**Research Assistant**
	Sam Houston State University
	Exercise and Substance Abuse Lab
	Supervisor: Craig E. Henderson, Ph.D.
9/2018 – 5/2019	**Research Assistant – Grant Funded**

Institute of Law, Psychiatry and Public Policy at the University of Virginia
Sam Houston State University
Supervisors: Daniel Murrie, Ph.D., Angela Torres, Ph.D., Brett Gardner, Ph.D., & Marc Boccaccini, Ph.D.

8/2017 – 8/2019   **Research Assistant**
Sam Houston State University
Integrative Health Lab
Supervisor: Chelsea Ratcliff, Ph.D.

8/2015 – 8/2017   **Graduate Lab Assistant - Volunteer**
Sam Houston State University
Exercise and Substance Abuse Lab
Supervisor: Craig E. Henderson, Ph.D.

8/2015 – 5/2016   **Graduate Lab Assistant - Volunteer**
Sam Houston State University
Supervisor: Melissa S. Magyar, Ph.D.

1/2015 – 5/2015   **Undergraduate Research Assistant**
University of Southern Maine
Supervisor: Elizabeth J. Vella, Ph.D.

SUPERVISORY EXPERIENCE

5/2020   **Mock Trial Crossing Attorney**
Forensic Assessment II (PSYC 8361)
Sam Houston State University
Supervisor: Mary Alice Conroy, Ph.D., ABPP (forensic)

8/2018 – 6/2019   **Peer Supervisor**
Capstone Practicum (PSYC 8382)
Sam Houston State University
Supervisor: Wendy Elliott, Ph.D., ABPP (forensic psychology)

5/2018 – 8/2018   **Peer Supervisor**
Introduction to Doctoral Practicum Course (PSYC 8381)
Sam Houston State University
Supervisor: Mary Alice Conroy, Ph.D., ABPP (forensic)

TEACHING EXPERIENCE

8/2020 – Present	**Graduate Teaching Assistant**
	Doctoral Clinical Practicum I & II (PSYC 8382)
	Sam Houston State University
	Supervisor: Craig E. Henderson, Ph.D.

-

8/2018 – 5/2019	**Graduate Teaching Assistant**
	Assessment of Intelligence and Achievement (PSYC 5395)
	Sam Houston State University
	Supervisor: Amanda Venta, Ph.D.

PROFFESIONAL SERVICE, LEADERSHIP, AND PROJECTS

| 8/2019 – 8/2020 | **Campus Representative – Sam Houston State University** |
| | Division 41 American Psychology – Law Society |

2/2019 – Present	**Remote Trial Consultant**
	Scientific Resources for the Law
	University of Nebraska – Lincoln
	Lincoln, Nebraska
	Supervisor: Casey Tisdale, M.A.; Joshua Haby, M.A., MLS; Eve Brank, J.D., Ph.D.

12/2018 – Present	**Volunteer**
	Huntsville Walker County Animal Shelter
	Huntsville, Texas

9/2018	**Clinician Actor**
	Trauma Assessment Training with Diverse, High Risk Clients
	Funded by The American Psychological Association Committee on Diversity/American Psychological Association Relations (CODAPAR) Grant
	Co-sponsored by The American Psychological Association Division 56: Trauma Psychology

7/2018 – 7/2019	**Secretary**
	Graduate Student Psychology Organization
	Sam Houston State University, Huntsville, Texas

| 4/2018 | **Volunteer Assistant Event Coordinator** |

American Academy of Forensic Psychology, Continuing Education Workshops, New Orleans, Louisiana

INVITED LECTURES

2020   **Substance Use Policy in the United States**
Honors 3375 02
Honors Dialogues Seminar
Sam Houston State University, Huntsville, Texas

2019   **Research Process and Design**
AP Research
Sanford High School, Sanford, Maine

LICENSES

2016   Licensed Chemical Dependency Counselor – State of Texas
Inactive

2014   Licensed Alcohol and Drug Counselor – State of Maine
Inactive

CERTIFICATIONS

2016   Advanced Emergency Medical Dispatcher – International

2012   Mental Health & Rehabilitation Technician/C – Maine

2011   Behavioral Health Professional –Maine

AWARDS AND GRANTS

2020   APA Division 50 – Society of Addiction Psychology – Student Research Grant Award
$450

2020   Sam Houston Area Psychological Association Travel Award
$50

2020/2021   Texas Public Educational Grant
$2,500

2020   Sam Houston State University CARES Grant
$2,750

2020   Expert Testimony Training Program – Concept Professional Training in Forensic Mental Health
$250

2020   AP-LS Travel Award – Sam Houston State University
$1,000

2019/2020	College of Humanities and Social Sciences Scholarship *$4,000*
2018/2019	Graduate Student Organization of the Year: Graduate Student Psychology Organization (*Secretary*)
2019	AP-LS Travel Award – Sam Houston State University *$1,000*
2019	College of Humanities and Social Sciences Scholarship *$2,000*
2018	College of Humanities and Social Sciences Scholarship *$7,000*
2018	AP-LS Travel Award – Sam Houston State University *$1,000*
2017	Sam Houston Area Psychological Association Travel Award *$60*
2017	College of Humanities and Social Sciences Scholarship *$2,000*
2016	Sam Houston Area Psychological Association Travel Award *$75*
2016	National Military Family Association Scholarship - Fisher House *$1,500*
2015	College of Humanities and Social Sciences Scholarship *$3,000*
2014	Next Step Maine Scholarship *$2,000*
2012/2013	Vincent B. and Barbara G. Welch Scholarship *$1,000*

PROFESSIONAL MEMBERSHIPS

2019	Society of Addiction Psychology (APA Division 50)
2017	Sam Houston Area Psychological Association
2015	American Psychological Association
2015	American Psychology – Law Society (APA Division 41)
2014	Psi Chi