

MOTIVATION FOR TREATMENT ENGAGEMENT IN A METHADONE
MAINTENANCE TREATMENT PROGRAM FROM A SELF-DETERMINATION
THEORY FRAMEWORK

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MAINTENANCE TREATMENT PROGRAM FROM A SELF-DETERMINATION
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DEDICATION

This thesis is dedicated to my husband, Jack, for the love and support he has given me; to my work-wife, Beata, for the companionship and laughter; to my lab-dad, Craig, for the validation and guidance; and to my four-legged children, Beethoven, Atlas, and Augustus, for the entertainment and comfort.

ABSTRACT

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Over 2 million people in the United States have an opioid use disorder (OUD) (Alderks, 2017). However, only 19% of people with an OUD in the U.S. are in medication-assisted treatment, such as methadone maintenance treatment (MMT; SAMHSA, 2018). A drawback of MMT is the effort and motivation required from opioid users to engage in this form of treatment. The theory of self-determination posits that the basic needs driving motivation are relatedness, competence, and autonomy (Deci & Ryan, 1985; Deci & Ryan, 2000). Self-determination theory (SDT) has been applied to addiction in previous research (Groshkova, 2010; Kennedy & George, 2009; Simoneau & Bergeron, 2003), but has rarely been applied to the population of MMT patients (Zeldman et al., 2004; Groshkova, 2010). The objective of this study was to examine the association of relatedness (conceptualized as perceived social support), competence (conceptualized as self-efficacy), and autonomy (conceptualized as autonomous functioning) with treatment engagement (conceptualized as treatment attendance) and number of positive drug screenings in individuals receiving MMT for opioid dependence.

It was expected that the relation between perceived social support and substance use-related outcomes would be explained in part by increased feelings of autonomous functioning and increased self-efficacy. Results of the present study suggest that increased relatedness to others indirectly decreases the positive drug screenings one has in methadone treatment by way of increasing feelings of autonomy.

KEY WORDS: Opioid use disorder, Methadone, Self-determination theory, Motivation.

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CHAPTER I

Introduction

Over 2 million people in the United States have an opioid use disorder (OUD; Alderks, 2017). Methadone has been used as a treatment for OUD for over 50 years, as it is a fast, cheap, and effective form of treatment (Alderks, 2017; D'Aunno, Park, & Pollack, 2019). Methadone itself is an opioid, however, is medically useful to people with OUDs because it prevents the cravings and withdrawal symptoms without the same level of euphoric “high” that their drugs of choice cause. The most typical course of methadone maintenance treatment (MMT) involves the patient coming to a clinic daily for their medication. As they progress through treatment, their dosage lessens, and they may be given take-home prescriptions in order to decrease frequency of visits. As of 2017, methadone treatment accounts for 28% of all substance abuse treatment per year (Substance Abuse and Mental Health Services Administration [SAMHSA], 2018). The availability of methadone treatment has increased over the past decade, making it easier for people needing treatment to receive it (Alderks, 2017). However, only 19% of people with an OUD in the U.S. are in medication-assisted treatment, such as methadone maintenance (SAMHSA, 2018). A possible explanation for this discrepancy is that MMT requires a large amount of effort and motivation from the patients themselves. Peterson and colleagues (2010) interviewed people with OUDs who decided not to attend MMT and found many barriers and justifications, including disinterest in long-term treatment and dissatisfaction with the demanding schedule.

SUDs and Perceived Social Support

Not only do people with substance use disorders (SUDs)—especially for those with OUD—struggle with the chronic nature of their disorder through physical symptoms of withdrawal and cravings, they also deal with the social rejection and stigma that comes with the disease of addiction, leading to decreased overall well-being (Birtel, Wood, & Kempa, 2017; Hyman, Hong, Chaplin, Dabre, Comegys, Kimmerling, & Sinha, 2009). People with SUDs perceive having less social support than people without SUDs, which is particularly unfortunate because higher levels of perceived social support (PSS) have been shown to predict more positive substance use-related outcomes (e.g., less substance use, higher treatment retention) and better psychological well-being (Andersen, 2018; Birtel et al., 2017; Schmitt, 2003; Zhou, Li, Wei, & Zhuang, 2017). However, this association between social support and substance use has not been consistent throughout the literature (Goehl, Nunes, Quitkin, & Hilton, 1993; Moore, Seavey, Ritter, McNulty, Gordon, & Stuart, 2014; Smith, 2002).

In addition to the lack of social support, many people with SUDs lack the motivation to change their behavior due to the nature of the disorder (Zeldman, Ryan, & Fiscella, 2004). Repeated drug use alters the mesolimbic system of the brain that is responsible for rewards and motivation, as well as decreasing the prefrontal cortex's control over executive functioning, thus leading to a state of hypo-frontality and decreased motivation for all non-drug related affairs (Volkow, Wang, Fowler, & Tomasi, 2012). In other words, people with OUDs have less ability to direct their motivation toward decreasing substance use partially due to the impact it has had on their brain

functioning. This issue, in addition to the lack of social support overall, adds to the obstacles that diminish motivation and maintain opioid use for so many.

Self-Determination Theory and Substance Use Treatment

The theory of self-determination posits that the basic needs driving motivation are relatedness, competency, and autonomy (Deci & Ryan, 1985; Deci & Ryan, 2000).

Relatedness is defined as feelings of acceptance from others, competence is defined as feelings of effectiveness and confidence, and autonomy is defined as feelings of volition (Ryan & Deci, 2000; Deci & Ryan, 2014). When these three needs are satisfied, intrinsic motivation and mental health flourishes, and contrastingly when thwarted, leads to decreased motivation and well-being (Ryan & Deci, 2000). Research on the self-determination theory (SDT) as applied to relationships has found that having strong, influential relationships may cover all three needs (Deci & Ryan, 2014; La Guardia, Ryan, Couchman, & Deci, 2000). Thus, as proposed by the relationships motivation theory (a sub-theory of SDT), the need for relatedness (or social support) is likely the most influential driver of motivation (Deci & Ryan, 2014).

SDT has been applied to addiction in previous research (Groshkova, 2010; Kennedy & Gregoire, 2009; Simoneau & Bergeron, 2003; Wild, Cunningham, & Ryan, 2006), but has rarely been applied to the population of MMT patients (Zeldman et al., 2004). Continuing outpatient treatment, such as methadone, requires immense intrinsic motivation for people with OUDs. Within outpatient treatment samples, those with higher reported internal motivation were more involved in treatment and had higher attendance (Ryan, Plant, & O'Malley, 1995). Additional research has demonstrated that if people with substance use disorders possess internal motivation, they will be driven to engage in

treatment regardless of external pressures (Wild, Cunningham, & Ryan, 2006). Primarily, research has focused on the impact of clinical staff or counselors' autonomy-supportive behavior on the motivation of people in SUD treatment (Groshkova, 2010; Zeldman et al., 2004). The SDT framework has been shown to be useful for clinicians within SUD treatment by demonstrating that SDT explains a large portion of variance within the dynamic motivations for change in treatment for SUDs (Simoneau & Bergeron, 2003). In addition, the degree to which each of the three needs affects someone may depend on the social context, therefore it may be hypothesized that relatedness may be the most salient for people with OUDs because of the already diminished PSS and increased social isolation (Ryan & Deci, 2000; Zhou, Ji, Li, Fu, & Zhao, 2009). The present study measured overall motivation via a SDT framework among patients with OUDs who are receiving MMT rather than specifically substance use-related motivation in order to capture a more holistic view of their motivation, as well as specifically within an MMT sample rather than a broader spectrum of clients receiving other types of SUD treatment.

The Present Study

The objective of this study is to examine the association of relatedness (conceptualized as PSS), competence (conceptualized as self-efficacy), and autonomy (conceptualized as autonomous functioning) with motivation to engage in treatment (conceptualized as treatment attendance) and number of positive drug screenings in individuals receiving MMT for opioid dependence. The primary aim of the present study was to examine the relation between PSS and two substance use-related outcomes (treatment attendance and drug screening results). Previous research has had mixed findings on the strength of this relation, which may be due to the population of people

with SUDs having lower PSS than those who do not (Zhou et al., 2009). This study measured only general PSS rather than abstinence-related social support, as previous studies of MMT samples have found general PSS to be a stronger predictor of positive substance use-related outcomes (Havassy, Wasserman, & Hall, 1995; Schmitt, 2003). Because of limitations regarding the number of drug screenings collected, the hypotheses including drug screenings are exploratory and marked with asterisks.

Hypothesis 1: Based on self-determination theory, it was hypothesized that perceiving more social support will fulfill the need for relatedness, which in turn will increase motivation to remain in treatment and decrease substance use.

H1a: Perceived social support will be positively correlated with treatment attendance.

H1b: Perceived social support will be negatively correlated with positive drug screening results.*

The secondary aim of the present study was to examine the mediating role of autonomous functioning and self-efficacy in substance use outcomes. Self-efficacy has been shown to mediate treatment effects in substance use populations previously (Kadden & Litt, 2011), while other studies have not found support for this association (Franckowiak & Glick, 2015). Despite the inconsistent findings, Kadden and Litt (2011) provided a recent and comprehensive review of the literature, with the bulk of the evidence supporting the importance of self-efficacy. Within a MMT sample, those with higher perceived support for autonomy had better treatment outcomes (Zeldman, Ryan, & Fiscella, 2004).

Hypothesis 2: Based on self-determination theory, it was hypothesized that fulfillment of the need for relatedness (i.e., PSS) will be associated with increased competence (i.e., self-efficacy) and increased autonomy (i.e., autonomous functioning), which in turn will increase motivation to continue treatment without positive drug screenings. In other words, PSS will indirectly effect substance use-related outcomes via increased feelings of autonomous functioning and increased self-efficacy.

H2a: Self-efficacy will mediate the association between perceived social support and treatment attendance.

H2b: Self-efficacy will mediate the association between perceived social support and drug screening results.*

H2c: Autonomous functioning will mediate the association between perceived social support and treatment attendance.

H2d: Autonomous functioning will mediate the association between perceived social support and drug screening results.*

CHAPTER II

Method

Participants

This study used a community sample of adults from a chain of MMT clinics in a large Midwestern U.S. city and its surrounding areas. An a priori power analysis was conducted via G*Power software to estimate sample size (Erdfelder, Faul, & Buchner, 1996). With five predictors entered—one independent variable, one mediator, and three potential covariates—a sample size of 196 participants was needed to detect a small-to-medium effect size ($f = .26$) as statistically significant at .05 alpha, and .80 power. To allow for attrition as well as other possible variables that will need to be controlled, the goal was 300 participants. In total, 298 individuals participated in the study.

Table 1
Participant Demographics (n = 298)

Demographic	M ± SD or Frequency	Percentage
Age	49.43 ± 11.32	
Gender		
Male	169	56.7%
Female	129	43.3%
Ethnicity		
Hispanic/Latino	33	11.1%
Not Hispanic/Latino	262	87.9%
Other	3	1%
Race		
Black/African American	184	61.7%
White/Caucasian	111	37.2%
Pacific Islander	1	.3%
Native American	1	.3%
Other	1	.3%

The selection criteria for participants was that they are patients of the MMT clinics, are over 18 years old, have been in treatment for at least three weeks, not have a

mental disorder that may impact ability to consent (i.e., learning disorder, psychotic disorder) and speak, read, and write English. Fifteen participants were excluded on the basis of length of time in treatment, yielding a final sample of 283.

Measures

The study included individual scales to measure perceived social support, self-efficacy, and autonomous functioning. The remaining information for outcome variables, demographic information, and potential covariates including clinic location, age, gender, length of drug use, previous attempts to discontinue drug use, and length of time in treatment, was extracted from the participants' records.

Perceived social support. The Multidimensional Scale of Perceived Social Support (MSPSS) was used to measure PSS (Zimet, Dahlem, Zimet, & Farley, 1988). It consists of 12 items (e.g., "I have a special person who is a real source of comfort to me") and uses a 7-point Likert scale from 1 (*Very strongly disagree*) to 7 (*Very strongly agree*) with the statements about PSS. The MSPSS can be scored as a total or with subscales of *Significant Other*, *Family*, and *Friends*. For this study, the overall score was used. The need for relatedness is captured by this measure of PSS because it asks about close, personal relationships that fulfill the need for relatedness. The subscales were validated through confirmatory factor analysis and were shown to have good construct validity (Zimet et al., 1990). This measure had an overall internal reliability score of $\alpha = .94$ in the present sample.

Self-efficacy. The Generalized Self-Efficacy scale (GSE) was used to measure self-efficacy (Schwarzer & Jerusalem, 1995). This measure has 10 items (e.g., "I am confident that I could deal efficiently with unexpected events") on a 4-point Likert scale

from 1 (*Not at all true*) to 4 (*Exactly true*). The score is calculated by summing the items. Self-efficacy and competence are interrelated; therefore, this scale can be conceptualized as a measure of competence (Ryan & Deci, 2000; Sweet, Fortier, Strachan, & Blanchard, 2012). Criterion validity has been shown through negative correlations with many negative traits such as depression, anxiety, stress, and burnout, as well as through positive correlations with optimism, satisfaction, and positive emotions (Schwarzer, 2014). The internal reliability of this measure was $\alpha = .91$ in the present sample.

Autonomous functioning. The Index of Autonomous Functioning (IAF) was used to measure autonomous functioning (Weinstein, Przybylski, & Ryan, 2012). This scale consists of 15 items (e.g., “My decisions represent my most important values and feelings”) with a 5-point Likert scale ranging from 1 (*not at all true*) to 5 (*completely true*). The IAF can be scored as a total or with subscales of *Authorship/Self-Congruence*, *Susceptibility to Control*, and *Interest Taking*, but the *Interest Taking* subscale has not been validated. For this study, the overall score was used. The *Susceptibility to Control* subscale must be reverse scored before calculating the average for the total score. This measure was developed based on SDT’s definition of autonomy, which is a unique construct from independence or similar ideas, therefore it is the most suitable measure (Weinstein et al., 2012; Ryan & Deci, 2000). This scale has been shown to have criterion validity by positively correlating with the other two basic needs of SDT, relatedness and competence, while also having moderate correlations to personality traits that are related but distinct from an autonomous disposition (Weinstein et al., 2012). The internal consistency for the overall IAF was reported as $\alpha = .54$ in the present sample, which is notably lower than in previous studies (Weinstein et al., 2012).

Outcome variables. The necessary information for measuring treatment attendance and drug screenings was collected from the participants' files at the MMT clinic. Treatment attendance was constructed as treatment days attended divided by treatment days scheduled to create a proportion of attendance. In order to have enough data for this outcome, participants must have been in treatment for at least three weeks.

The drug screenings administered by clinical staff are oral swabs that detect methadone, opiates, benzodiazepines, cocaine, and methamphetamines. The oral swabs were analyzed by Clinical Science Laboratory until May of 2019 when the clinic switched labs to Premier Biotech. The detection window for this screening method is up to 36 hours (Dolan, Rouen, & Kimber, 2004). A drug screening that is positive for opiates (excluding methadone) was considered a positive drug screening. A drug screening that is negative for opiates (excluding methadone) was considered a negative drug screening. The proportion of drug screenings positive for opiates out of drug screenings total was used for data analysis.

Procedure

The data collection sites were a chain of seven government-funded (Medicaid) MMT clinics within the city and surrounding suburbs. Participants provided informed consent for the study and consented for their patient files over the past year to be reviewed for the purpose of measuring the dependent variables (treatment attendance and drug screening results) and demographics. A short paper-and-pencil questionnaire (<15 minutes) was administered to participants in the waiting area of the treatment centers. Appropriate IRB and business approvals were obtained prior to data collection (see Appendix).

CHAPTER III

Results

Preliminary Analyses

To address missing items, a proportional mean score was computed for the participants that were missing half or less items on a particular scale. For those missing over half of the items on a scale, multiple imputation procedures were used to replace missing values. The two dependent variables were normally distributed as evidenced by skewness and kurtosis of each being within normal limits (i.e., within 3 units). Univariate outliers were also assessed, and though some were noted in self-efficacy and proportion of treatment attendance, ultimately no participants were removed to attempt preserve the representational sample.

Table 2
Descriptive Information (n = 298)

Variable	M ± SD or Frequency	Percentage
Total Days in Treatment	262.18 ± 123.53	
Treatment Days Attended	245.44 ± 119.12	
Total Drug Screenings Taken	6 ± 2.63	
Clinic Location		
Clinic 1	85	28.5%
Clinic 2	72	24.2%
Clinic 3	31	10.4%
Clinic 4	20	6.7%
Clinic 5	27	9.1%
Clinic 6	58	19.5%
Clinic 7	5	1.7%

Appropriate items were reversed scored, scale scores were calculated, and proportional scores were computed for the dependent variables. Proportion of treatment attendance was calculated as treatment days attended divided by treatment days

scheduled, and proportion of positive drug screenings was calculated as drug screenings positive for opiates (not including methadone), fentanyl, or both divided by drug screenings taken. Fentanyl screening only began after the new medical laboratory began processing the results, therefore data on the substance specifically was incomplete.

Pearson bivariate correlations (shown in Table 3), t-tests, and ANOVAs were conducted to examine the effects of potential covariates, such as age, gender, race, ethnicity, clinic location, education, length of heroin use, and previous substance use treatments.

Table 3

Correlations of Variables of Interest

Variables	1	2	3	4	5	6	7	8	9	M	SD
1. Age	-									49.43	11.32
2. Education (yrs)	-.15*	-								11.76	1.48
3. Length of heroin use (yrs)	.57**	-.14*	-							19.01	11.95
4. # of previous treatments	-.05	.04	.05	-						2.76	7.16
5. GSE	-.04	.10	-.09	.04	-					30.20	6.24
6. MSPSS	.02	.06	-.03	-.07	.52**	-				59.23	18.31
7. IAF	-.03	.21**	-.10	.00	.51**	.57**	-			50.39	7.08
8. Proportion of Treatment days	.10	.08	.06	.01	.05	.01	.03	-		.93	.09
9. Proportion positive drug screenings	.04	.00	.01	-.01	-.09	-.07	-.17*	-.32**	-	.34	.31

Notes. GSE = competence MSPSS = relatedness IAF = autonomy * $p < .05$, ** $p < .001$

For gender, an independent samples t-test revealed a small, significant difference between male and female gender on the variable of proportion of treatment attendance, in that males (.94 ± .073) had a higher proportion of treatment attendance than females (.91 ± .11), $t(296) = -2.503, p = 0.013$. To maintain generalizability, and due to the small effect size, gender was not controlled for in the following analyses (Spector & Brannick, 2011).

Regression Analyses

The study aims were assessed by two linear regression analyses. Perceived social support did not significantly predict treatment attendance ($B = <0.001, t(282) = .178, p = .859$); however, positive drug screenings was marginally significant ($B = -.012, t(282) = -1.921, p = .055$). A direct effect does not need to be present in order to examine for an indirect effect, therefore the secondary aim was assessed (Zhao, Lynch, & Chen, 2010).

The secondary aim was examined by four bootstrapped tests of indirect effects as described by Preacher and Hayes (2004) via the PROCESS macro model 4 for SPSS (Hayes, 2017). Each model was assessed in the first imputation and was examined in subsequent imputations only if there were significant results in the first imputation.

For social support, self-efficacy, and treatment attendance, the test of indirect effect did not indicate the presence of a significant mediational model. The mean of the indirect effect across all 5,000 bootstrapped samples estimated at .0001 and a resulting confidence interval of -.0001 to .0004.

For social support, autonomous functioning, and treatment attendance, the test of indirect effect did not indicate the presence of a significant mediational model. The mean of the indirect effect across all 5,000 bootstrapped samples estimated at 0 and a resulting confidence interval of -.0003 to .0008.

For social support, self-efficacy, and positive drug screenings, the test of indirect effect did not indicate the presence of a significant mediational model. The mean of the indirect effect across all 5,000 bootstrapped samples estimated at -.0006 and a resulting confidence interval of -.0018 to .0005.

For social support, autonomous functioning, and positive drug screenings, the test of the indirect effect in the first imputation indicated the presence of a significant mediational model; therefore, the model was assessed in the other imputations and results were averaged together for a pooled effect. The mean of the indirect effect across all multiple imputations and bootstrapped samples estimated at -.0022 and a resulting confidence interval that did not include 0 (CI = -.0036, -.0008; Preacher & Hayes, 2008).

Table 4

Results of Mediation Analyses: Indirect Effects and 95% Confidence Intervals

IV	Mediator (M)	DV	Direct effect of IV on DV		Indirect effect	95% Confidence Interval	
			B	SE		Lower	Upper
MSPSS	GSE	Tx att	.000	.000	.0001	-.0001	.0004
MSPSS	IAF	Tx att			.0000	-.0003	.0008
MSPSS	GSE	+s	-.012	.006	-.0006	-.0018	.0005
MSPSS	IAF	+s			-.0022*†	-.0036	-.0008

Notes. MSPSS = relatedness GSE = competence IAF = autonomy Tx att = proportion of treatment days attended +s = proportion of positive drug screenings

* $p < .05$

†Pooled result from multiple imputation dataset

CHAPTER IV

Discussion

The primary aim of this study was to examine the direct relation between relatedness and substance use-related outcomes. Previous literature had mixed findings on the strength of this correlation, which ultimately was not significant in the present study. However, the relation between perceived social support and drug screenings was approaching significance. The SDT literature, specifically relationships motivation theory, is supportive of this relation in that strong relationships may cover all three needs of relatedness, autonomy, and competence in order to drive motivation (Deci & Ryan, 2014). Also, other studies outside of SDT literature have shown a relation between social support and decreased substance use (Andersen, 2018). Given the limited research in this area of study, this finding may be cautiously interpreted as warranting further study.

While the rationale for this hypothesis was based in relatedness being most salient for people with OUDs due to diminished PSS, the sample collected resulted in a mean score of overall PSS that is considered moderate to high (Zimet, 2016). Although it could be that this sample had overall higher perceived support from their social relationships than previous samples, it could also be that the participants responded in a manner that is socially desirable rather than forthcoming. However, previous research that also did not support a relation between social support and substance use-related outcomes found that it may relate to depression, personality characteristics, drug use of peers, and other various factors (Schmitt, 2003). Overall, the findings from this study suggest that the connection between social support, or relatedness, and substance use outcomes is still unclear, and may be more complicated than originally hypothesized.

The secondary aim of this study was to examine the mediating role of the other two components of SDT theory, autonomy and competence, on treatment attendance and positive drug screenings. While autonomy was found to have an indirect effect, competence did not. Previous literature surrounding self-efficacy, or competence, and its association with substance use-related outcomes was also mixed, albeit the majority supporting a significant relation (Kadden & Litt, 2011). Franckowiak and Glick (2015) found no significant relation between self-efficacy and treatment outcomes, although they did report that self-efficacy scores improved over the course of treatment. It is possible that this relation may be dependent on time in treatment, which could be explored in future analyses.

Regarding the final component of SDT, results of the present study suggest that increased relatedness to others indirectly decreases the positive drug screenings one has in methadone treatment by way of increasing feelings of autonomy. Although the effect size is quite small for this finding, it is still meaningful because it adds to the literature on the sub-theory of SDT, relationships motivation theory (Deci & Ryan, 2014). Social support does appear to increase feelings of autonomy, which then leads to decreased opioid use. This finding was based on one of the exploratory hypotheses, but it has support in previous literature regarding autonomous functioning in an MMT sample (Zeldman et al., 2004). In the 2004 study, the researchers found that those with higher autonomy for treatment had less positive drug screenings and higher treatment attendance. However, autonomous functioning had no effect on treatment attendance in the present study. This finding adds to the literature about social support and its role in treatment, highlighting the indirect effect that feelings of autonomy can provide.

Limitations and Future Directions

Several limitations regarding this study should be noted. First, the findings are based on self-report. The information from the medical records was gathered during an intake interview from the beginning of their treatment, which could be outdated depending on how long the participant has been a patient at the clinic. Because the interview was dictated by the participant but typed by the interviewer into the medical file, there is also the chance of error as introduced by the third party.

Second, as the questionnaire was quite brief, the researchers did not randomize the measures or include validity items. However, based on the uneven responses (i.e., less people provided full responses to later scales), it appears randomization of measures should have been applied. There is also evidence that validity items may have been appropriate to include, due to an unusual finding about the IAF scale. The IAF scale contains reverse scored items, however when comparing the reliability coefficient of the non-reversed, improperly scored IAF at $\alpha = .92$, to that of the reversed, properly scored IAF at $\alpha = .54$, it appears the sample either did not understand the reversely worded questions or did not pay attention. If attention-based validity items had been included, it would provide some clarification as to this unexpected finding. Other evidence from the sample might suggest a lack of understanding, or specific difficulty with this measure, due to the significant positive correlation between IAF and education, $r(298) = .21, p < .001$. It is possible that this measure was not appropriate for the reading level of this sample, due to anecdotal evidence that multiple participants asked for the definitions of “congruent” and “oppose,” both of which appear in the IAF scale.

Lastly, the data was collected in a naturalistic setting, therefore the environment may have caused distraction and could not be controlled. Notably, participants were seen to communicate with each other regarding the questionnaire and participation, and it is possible that those interactions influenced who participated and their responses. This sample was collected through convenience sampling methods, and therefore those who attend treatment more frequently had a higher chance of being present for data collection, which may account for the lack of significant results regarding treatment attendance.

The overall perceived social support score was used for the purpose of this study, but it is possible that meaningful differences may exist between the three categories of social support—family, friends, and significant others—in their effect on substance use-related outcomes. In a previous study, people receiving MMT treatment reported highest support from their family (Zhou et al., 2017). Future analyses may examine these potential differences and could compare those rating different categories at different levels of support to examine if one form of social support is a stronger predictor.

Because this study utilized a community sample and gathered a diverse group, further exploration could be conducted on how demographic factors that were not assessed in the present study (i.e., justice system involvement, previous mental health treatment) may interact with the SDT model and substance use-related outcomes. A portion of the sample were in treatment for at least one year and had a perfect treatment attendance record ($n = 24$), and more were near that mark, which could yield interesting descriptive comparisons to those with poor treatment attendance, and those have been in treatment for less time.

In the future, a replication of this study could include further measures of motivation and potentially identify a more suitable measure of autonomous functioning for this population. More variables that may influence social supports' impact on substance use, such as those identified in previous literature, could be included to further examine what seems to be a complex and still undetermined relation between social support and opioid use. Overall, much more is yet to be explored regarding motivation and substance use within this population of MMT patients, and the findings of the present study establish groundwork for further research to expand upon.

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APPENDIX

Date: 5-15-2020

IRB #: IRB-2019-126

Title: Examining Relapse and Treatment Attendance in a Methadone Maintenance Treatment Sample

Creation Date: 4-13-2019

End Date: 7-30-2020

Status: **Approved**

Principal Investigator: Beata Krembuszewski

Review Board: SHSU IRB

Sponsor:

Study History

Submission Type	Initial	Review Type	Full	Decision	Approved
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Key Study Contacts

Member	Craig Henderson	Role	Co-Principal Investigator	Contact	ceh003@shsu.edu
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Member	Emma Anderson-White	Role	Co-Principal Investigator	Contact	eaa051@shsu.edu
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Member	Beata Krembuszewski	Role	Principal Investigator	Contact	bak021@shsu.edu
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Member	Emma Anderson-White	Role	Primary Contact	Contact	eaa051@shsu.edu
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Brian Nottage
Vice President
Family Guidance Centers, Inc.
April 18, 2019

To Whom It May Concern,

I am writing this letter to show my awareness, approval, and support of the research project, titled "Examining Relapse and Treatment Attendance in a Methadone Maintenance Treatment Sample", being conducted by Beata Krembuszewski and Emma Anderson-White at Sam Houston State University. I am allowing the researchers to visit all of our Family Guidance Centers, Inc. locations in the Chicagoland area and collect data from our clients. They will be allowed to recruit participants for their study from the clients that are in the waiting room of our clinics. The participants can fill out their informed consent forms, their medical release forms, and take the surveys before or after they receive their methadone or when they are waiting to speak with their counselors.

After clients consent to being participants in the study, I am giving permission to Beata Krembuszewski to log on to our SAMMS database and obtain the additional data from our clients' electronic files. I understand that all of the information from the database will be kept in an Excel spreadsheet on encrypted flash drives that are only accessible by the IRB approved research personnel. I also understand that the information kept on the Excel spreadsheet will be de-identified and the only identifiable information will be the consent forms that will be kept in a locked filing cabinet behind a locked door in Beata Krembuszewski's office.

I believe that this project is relevant and timely and I think it will make a significant contribution to the field of addiction studies.

Sincerely,

A handwritten signature in black ink that reads "Brian Nottage".

Brian Nottage
Vice President
Family Guidance Centers, Inc.
bnottage@fgcinc.org
(773) 841-9200

HIPAA-Compliant PHI Release Form

Authorization for Disclosure of Protected Health Information

I, _____, authorize the disclosure of my protected health information¹ as described herein. I understand that this authorization is voluntary and made to confirm my direction. I understand that, if the person(s) or organization(s) that I authorize to receive my protected health information are not subject to federal and state health information privacy laws², subsequent disclosure by such person(s) or organization(s) may not be protected by those laws.

1. I authorize the following organization to disclose my protected health information (as specified below):

Organization: **Family Guidance Centers, Inc.**

2. I authorize the following person(s) and/or organizations to receive my protected health information as disclosed by the organization above.

**Health Behaviors Research Lab
Sam Houston State University
1905 University Ave, Huntsville, TX 77340
936-294-4011**

3. Specific description of the protected health information that I authorize for disclosure: diagnoses, mental health treatment, progress notes, demographic information, social history, history of substance use, biopsychosocial assessment, criminal background history, treatment plans, discharge and admission dates, and program enrollment.

4. Specific description of the purpose for each use or disclosure: academic psychological research.

5. I understand that I may revoke this authorization in writing at any time, except to the extent that the person(s) and/or organization(s) named above have taken action in reliance on this authorization.

I have had the opportunity to read and consider the contents of this authorization. I confirm that the contents are consistent with my direction.

Signed _____ Date _____

Name: _____

Client ID: _____

This Authorization to disclose PHI constitutes a waiver of privilege per 76 O.S. §19. Photostatic copies of this Authorization carry the same authority as the original.

¹ Protected health information ("PHI") is health information that is created or received by a health care provider, health plan, or health care clearinghouse which relates to: 1) the past, present or future physical or mental health of an individual; 2) the provision of healthcare to an individual; or 3) the past, present, or future payment for the provision of healthcare to an individual. To be protected, the information must be such that it identifies the individual or provides a reasonable basis to believe that the information can identify the individual. 45C.F.R.164.508

² These laws apply to health plans, health care providers, and health care clearinghouses.

Sam Houston State University

Consent for Participation in Research

Examining Relapse and Treatment Attendance in a Methadone Maintenance Treatment Sample

Principal Investigator: Beata Krembuszewski
Department of Psychology
Sam Houston State University
Phone: (847) 989-4250
Email: bak021@shsu.edu

Co-Principal Investigator: Emma Anderson-White
Department of Psychology
Sam Houston State University
Phone: (817) 584-4564
Email: eaa051@shsu.edu

You are being asked to be a participant in a research study about factors influencing relapse and treatment attendance conducted by Beata Krembuszewski and Emma Anderson-White at Sam Houston State University. We are conducting this research under the direction of Dr. Craig Henderson. You have been asked to participate in the research because you are currently receiving treatment at a methadone clinic and may be eligible to participate. We ask that you read this form and ask any questions you may have before agreeing to be in the research.

NON-PARTICIPATION STATEMENT

Your participation in this research is voluntary. Your decision whether or not to participate will involve no penalty or loss of benefits to which the subject is otherwise entitled, and the subject may discontinue participation at any time without penalty or loss of benefits to which the subject is otherwise entitled.

PURPOSE

The purpose of this research is to examine protective factors for relapse for individuals receiving methadone maintenance treatment for opioid use disorder. This study will also examine individual factors that affect average treatment attendance days at a methadone clinic.

PROCEDURES

Approximately 250 participants will take part in this study.

If you agree to be in this research, we would ask you to do the following things:
Read and sign the HIPAA medical release form and give consent to researchers accessing electronic files on the SAMS database. Provide your SAMS client ID to researchers.
Take a brief survey (55 questions, 5-10 minutes) while in the waiting room of the clinic regarding various personal factors and perceived social support.

RISKS/DISCOMFORTS

Risk for participation in this project is minimal. However, due to the personal nature of the questions in the survey, you may feel uncomfortable answering. You do not have to answer every question and may discontinue your participation at any time. If you are feeling distressed or discomfited because of your participation and wish to speak with someone, you may contact the Crisis Hotline at 1-800-273-8255 or the mental health program at Family Guidance Center at 1-312-943-6545.

BENEFITS

While you will not directly benefit from participation, your participation is valuable to researchers in determining the underlying factors that influence relapse and treatment attendance.

ALTERNATIVES

Participation in this project is voluntary and the only other alternative to participating in this project is non-participation,

CONFIDENTIALITY

The only people who will know that you are a research participant are members of the research team. No information about you, or provided by you during the research will be disclosed to others without your written permission, except:

- if necessary to protect your rights or welfare; or
- if required by law.

When the results of the research are published or discussed in conferences, no information will be included that would reveal your identity. All information that is collected for this study will be kept confidential on password protected flash drives and will only be accessible by the research staff. You will be assigned an ID number and all responses and information collected from the SAMS database will only be linked to your assigned ID number. Consent forms and paper copies of surveys will be kept in a locked filing cabinet behind a locked door in the Principal Investigator's office.

Consent forms, HIPAA Medical Release forms, and the Excel spreadsheet containing data from the paper surveys and SAMS database will be kept for a period of 4-5 years after the study. Paper copies of the surveys will be destroyed after being entered into the spreadsheet and then examined for errors by the research team.

What if I am injured as a result of my participation?

In the event of injury related to this research study, you should contact your physician or the nearest medical provider. However, you or your third party payer, if any, will be responsible for payment of this treatment. There is no compensation and/or payment for medical treatment from Sam Houston State University for any injury you have from participating in this research, except as may be required of the University by law. If you feel you have been injured, you may contact the researcher, Beata Krembuszewski at 847-989-4250.

COSTS

There are no additional costs to the participant for participating in this research project.

REIMBURSEMENT

Participants will be given a choice of snack food items if they agree to participate in the research and complete the survey.

VOLUNTARY PARTICIPATION

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you do not want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so.

OFFER TO ANSWER QUESTIONS

The researchers conducting this study are Beata Krembuszewski & Emma Anderson-White under the supervision of Dr. Craig Henderson. You may ask any questions you have now. If you have questions later, you may contact the Dr. Craig Henderson at: Phone: (936) 294-3601 or Email: ceh003@shsu.edu

SUBJECT RIGHTS

If you feel you have not been treated according to the descriptions in this form, or you have any questions about your rights as a research participant, you may call the Office of Research and Sponsored Programs – Sharla Miles at 936-294-4875 or e-mail ORSP at sharla_miles@shsu.edu.

You may choose not to participate or to stop your participation in this research at any time. Your decision whether or not to participate will involve no penalty or loss of benefits to which the subject is otherwise entitled, and the subject may discontinue

participation at any time without penalty or loss of benefits to which the subject is otherwise entitled.

You will not be offered or receive any special consideration if you participate in this research.

AGREEMENT TO PARTICIPATE

I have read (or someone has read to me) the above information. I have been given an opportunity to ask questions and my questions have been answered to my satisfaction. I agree to participate in this research.

Consent: I have read and understand the above information, and I willingly consent to participate in this study. I understand that if I should have any questions about my rights as a research subject, I can contact Dr. Craig Henderson or by email at ceh003@shsu.edu or by phone at (936) 294-3601. I have received a copy of this consent form.

Your name (printed): _____

Signature: _____ Date: _____

Please answer the questions to the best of your ability. Please ask the researchers if you have any questions while you are completing the survey.

GSE	Not at all True	Hardly True	Moderately True	Exactly True
1. I can always manage to solve difficult problems if I try hard enough				
2. If someone opposes me, I can find the means and ways to get what I want.				
3. It is easy for me to stick to my aims and accomplish my goals.				
4. I am confident that I could deal efficiently with unexpected events.				
5. Thanks to my resourcefulness, I know how to handle unforeseen situations.				
6. I can solve most problems if I invest the necessary effort.				
7. I can remain calm when facing difficulties because I can rely on my coping abilities.				
8. When I am confronted with a problem, I can usually find several solutions.				
9. If I am in trouble, I can usually think of a solution.				
10. I can usually handle whatever comes my way.				

Please answer the following questions about a problematic situation you have experienced.

CSI	Not at All	A Little	Some-what	Much	Very Much
1. I just concentrate on what I had to do next: the next step.					
2. I changed something so that things would turn out all right.					
3. I stood my ground and fought for what I wanted.					
4. I made a plan of action and followed it.					
5. I tackled the problem head-on.					
6. I knew what had to be done, so I doubled my efforts and tried harder to make things work.					
7. It was a tricky problem, so I had to work around the edges to make things come out OK.					
8. I worked on solving the problems in the situation.					
9. I struggled to resolve the problem.					
10. I tried to get a new angle on the situation					
11. I looked for the silver lining, so to speak; tried to look on the bright side of things.					
12. I told myself things that helped me feel better.					
13. I looked at things in a different light and tried to make the best of what was available.					
14. I asked myself what was really important, and discovered that things weren't so bad after all.					
15. I convinced myself that things aren't quite as bad as they seem.					
16. I stepped back from the situation and put things into perspective.					
17. I recognized the way I looked at the situation, so things didn't look so bad.					
18. I went over the problem again and again in my mind and finally saw things in a different light.					

MSPSS	Very Strongly Disagree	Strongly Disagree	Mildly Disagree	Neutral	Mildly Agree	Strongly Agree	Very Strongly Agree
1. There is a special person who is around when I am in need.							
2. There is a special person with whom I can share joys and sorrows							
3. My family really tries to help me.							
4. I get the emotional help & support I need from my family.							
5. I have a special person who is a real source of comfort to me.							
6. My friends really try help me.							
7. I can count on my friends when things go wrong.							
8. I can talk about my problems with my family.							
9. I have friends with whom I can share my joys and sorrows.							
10. There is a special person in my life who cares about my feelings.							
11. My family is willing to help me make decisions.							
12. I can talk about my problems with my friends.							

IAF	Not at all True	A Bit True	Some - what True	Mostly True	Completely True
1. My decisions represent my most important values and feelings.					
2. I do things in order to avoid feelings badly about myself.					
3. I often reflect on why I react the way I do.					
4. I strongly identify with the things that I do.					
5. I am deeply curious when I react with fear or anxiety to events in my life.					
6. I do a lot of things to avoid feeling ashamed.					
7. I try to manipulate myself into doing certain things.					
8. My actions are congruent with who I really am.					
9. I am interested in understanding the reasons for my actions.					
10. My whole self stands behind the important decisions I make.					
11. I believe certain things so that others will like me.					
12. I am interested in why I act the way I do.					
13. I like to investigate my feelings.					
14. I often pressure myself.					
15. My decisions are steadily informed by things I want or care about.					

Thank you for your participation!

VITA

EDUCATION

Doctor of Philosophy, Clinical Psychology **Exp. Graduation:** 2024
Sam Houston State University **GPA:** 4.0

Master of Arts, Clinical Psychology **Exp. Graduation:** 2020
Sam Houston State University **GPA:** 4.0
Master's Thesis: *Motivation for Treatment Engagement in a Methadone Maintenance Treatment Sample from a Self-Determination Theory Framework*

Bachelor of Science **Graduation:** December 2017
University of North Texas **GPA:** 4.0
Majors: Psychology and Rehabilitation Studies **Minor:** Biology
Undergraduate Honors Thesis: *Attachment Styles, Coping Strategies, and Drinking Behaviors of College Students*

RESEARCH EXPERIENCE

Diversity and Health Behaviors Lab *August 2018—Present*
Craig Henderson, PhD, Professor
Lab Manager and Graduate Research Assistant

- Oversaw two research studies
- Provided orientation sessions
- Cleaned and analyzed longitudinal databases
- Managed undergraduate research assistants
- Funded through \$275,000 NIAAA Grant (R21 AA026380)
- *Informing Prevention by Modeling Associations Between Physical Activity and Alcohol Consumption*

Cross-Cultural Attachment Research Lab (CCARL) *August 2015—August 2018*
Chiachih DC Wang, PhD, Associate Professor, Director of Counseling Psychology program
Research Assistant

- Participated in group discussions and research studies
- Developed and assisted in maintaining SPSS databases
- Entered data into SPSS and performed data analysis
- Trained in Consensual Qualitative Research (CQR) methods
- Coded qualitative data using CQR methods
- Led and transcribed interviews
- Proctored participants for different studies
- Wrote and edited manuscripts
- Conducted literature searches

Motivational Science Lab

October 2015—December 2017

Rex Wright, PhD, Professor

Research Assistant

- Proctored participants for different studies
- Trained in EKG/ECG
- Recorded BP and HR data
- Trained in cardiac output and using bioimpedance techniques
- Measured pre-ejection period (PEP)
- Placed electrodes on participants

PEER-REVIEWED CONFERENCE PRESENTATIONS

Anderson-White, E., Krembuszewski, B., Henderson, C. E. (2020, August). Motivation in a Methadone Maintenance Treatment Program from a Self-Determination Theory Framework. *Poster accepted at the annual convention of the American Psychological Association, Washington, DC.*

Krembuszewski, B., **Anderson-White, E.**, Henderson, C. E., Sze, C. (2020, August). Positive Psychology as a Protective Factor for Illicit Opiate Use in Individuals Receiving Methadone Treatment. *Poster accepted at the annual convention of the American Psychological Association, Washington, DC.*

Krembuszewski, B., **Anderson-White, E.**, Henderson, C., Lewis, K., Ryan, L., Sze, C., & Trinka, M. (2020, February). Affirmative action: Are we solving or creating a problem?. *Oral presentation given at the Diversity Leadership Conference at Sam Houston State University, Huntsville, TX.*

Henderson, C. E., Salami, T., Anderson-White, E., Boland, G., Krembuszewski, B., Bailey, C., & Harmon, J. (2019, October). Working with Religiously Diverse Clients. *Workshop to be presented at the annual convention of the Texas Psychological Association, San Antonio, TX.*

Henderson, C. E., **Anderson-White, E.**, Frampton, A., Mollenkopf, K., Smith, T., Krembuszewski, B., Stallard, C., Duane, C., Crosby, J., & Henderson, S. (2019, August) Daily Variation in Spiritual Experiences and Relation with Life Satisfaction among Emerging Adults. *Poster presented at the annual convention of the American Psychological Association, Chicago, IL.*

Ricardo, M. M., Henderson, C. E., **Anderson-White, E.**, Christensen, M. R., Krembuszewski, B. & Kurus, S. J. (2019, August) 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.*

Krembuszewski, B., **Anderson-White, E.**, Boland, G., Blossom, L., Walker, M., & Henderson, C. (2019, February). Inclusion, Acceptance, and Bumps Along the Road. *Oral presentation given at the Diversity Leadership Conference at Sam Houston State University, Huntsville, TX.*

- Anderson, E.A.**, Jin, L., & Wang, D.C. (2018, April). Attachment Styles, Coping Strategies, and Drinking Behaviors of College Students. *Poster accepted for the annual convention of Southwestern Psychological Association, Houston, TX.*
- Anderson, E. A.**, Jin, L., Lin, Y.H., Yu, M.H., & Wang, D.C. (2017, November). Attachment and Death Attitudes: A Cross-Cultural Comparison Examination. *Poster presented at the annual Psychology Department Research Fair, Denton, TX.*
- Anderson, E. A.**, Jin, L., Lin, Y.H., Yu, M.H., & Wang, D.C. (2017, January). Attachment and Death Attitudes: A Cross-Cultural Comparison Examination. *Oral presentation given at the annual convention of American Association of Behavioral and Social Sciences, Las Vegas, NV.*
- Anderson, E. A.**, Khan, A., & Wang, D.C. (2016, April). Social Support on Adult Attachment-Death Anxiety Relationship: Mediator or Moderator? *Poster presented at the annual convention of Southwestern Psychological Association, Dallas, TX.*
- Anderson, E. A.** & Major, R. (2015, April). Methamphetamine and Exercise in Rats. *Poster presented at the annual Scholars' Day, Denton, TX.*

PUBLICATIONS AND MANUSCRIPTS

Christensen, M., **Anderson-White, E.**, Ryan, L., Ricardo, M., Krembuszewski, B.A., Sze, C., & Henderson, C. E. (Under contract) Substance use disorders. In Venta, A., Sharp, C., Fonagy, P., & Fletcher, J. (Eds.). *Developmental Psychopathology*. (pp. pages of chapter) Hoboken, NJ: Wiley-Blackwell.

CLINICAL EXPERIENCE

Student Clinician

August 2019-Present

Supervised by Drs. Jorge Varela and Laura Drislane

- Conducted clinical intakes and psychological assessments
- Wrote reports including diagnoses when applicable and treatment recommendations
- Provided therapy services

Student Forensic Evaluator

October 2019-Present

Supervised by Drs. Mary Alice Conroy and Wendy Elliot

- Conducted forensic interviews to assess competence to stand trial
- Wrote reports for the court regarding competence to stand trial

PROFESSIONAL MEMBERSHIPS

American Psychological Association
Member

January 2019—Present

American Psychological Association of Graduate Students *January 2019—Present*
Member

APA Division 50: Addiction Psychology *January 2019—Present*
Member

Southwestern Psychological Association *Fall 2015—Present*
Member

Texas Psychological Association *September 2018—Present*
Member

Psi Chi Honor Society in Psychology *Fall 2014—December 2017*
Member/Officer

LEADERSHIP EXPERIENCES

Psi Chi Honor Society in Psychology *Spring 2016—Spring 2017*
President

Psi Chi Honor Society in Psychology *Spring 2015—Spring 2016*
Vice President

Psi Chi Honor Society in Psychology *Fall 2014*
Vice President of Fundraising

HONORS & AWARDS

Distinguished Honors College Scholar Award *December 2017*
Excellence Scholarship I (\$32,000) *Fall 2014—Fall 2017*
President's List *Fall 2014—Fall 2017*
Outstanding Member of Psi Chi Honor Society in Psychology *Fall 2014*

RESEARCH INTERESTS

- Substance use disorders
- Motivation
- Empirically supported substance use treatment methods
- Cross-cultural populations
- Incarcerated populations