

IMPACT OF RELATIONSHIP QUALITY AND RECOVERY ATTITUDES ON
MEDICATION-ASSISTED TREATMENT FOR OPIOID USE AMONG EMERGING
ADULTS

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Emma Anderson-White

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IMPACT OF RELATIONSHIP QUALITY AND RECOVERY ATTITUDES ON
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by

Emma Anderson-White

APPROVED:

Craig Henderson, PhD
Committee Director

Chelsea Ratcliff, PhD
Committee Member

Laura Drislane, PhD
Committee Member

Kevin Wenzel, PhD
Committee Member

Chien-Pin Li, PhD
Dean, College of Humanities and Social
Sciences

DEDICATION

This dissertation is dedicated to my spouse, Jack, for his endless support and love over the years. He is the reason I have reached this far in my academic career without losing my sanity.

ABSTRACT

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Over 9 million Americans above 11 years old misused opioids in the last year, with the largest portion (1.4 million) of those individuals being in the young adult (i.e., 18-25 years old) range (Substance Abuse and Mental Health Services Administration [SAMHSA], 2021). The concept of recovery has been defined as the overall experience, encapsulating both the process and status of voluntarily using resources (i.e., recovery capital) to heal physically and psychologically (White, 2007). Literature of recovery capital in young/emerging adulthood suggests recovery capital may be even more important for the emerging adult population (Elswick et al., 2018; Mawson et al., 2015; Terrion, 2013). The present study examined the dynamic connection between severity of opioid use and aspects of recovery capital (i.e., recovery attitudes and relationship quality) in a sample of emerging adults receiving medication for opioid use disorder (MOUD). Recovery attitudes were found to buffer the association between initial opioid use and days of use during the study. Recovery attitudes were also observed to change over time, though not in a uniform direction. Findings regarding relationship quality approached significance. This study added to the literature of recovery capital and emerging adults by examining factors that are particularly important for this developmental stage. It also explored novel findings on recovery attitudes for emerging adults with opioid use, particularly in early recovery. Further research is needed with larger samples to replicate and expand the findings of the present study.

KEY WORDS: Opioid use disorder, Medication-assisted treatment, Emerging adults, Recovery capital.

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CHAPTER I

Introduction

Over 9 million Americans above 11 years old misused opioids in the last year, with the largest portion (1.4 million) of those individuals being in the young adult (i.e., 18-25 years old) range (Substance Abuse and Mental Health Services Administration [SAMHSA], 2021). Approximately 2.7 million people in the United States currently meet diagnostic criteria for opioid use disorder ([OUD] SAMHSA, 2021). In the last decade, the rapid spread of fentanyl and fentanyl analogues have increased fatal overdoses; meanwhile, heroin and other natural opioids have remained steady (Ahmad et al., 2021; Volkow et al., 2019). Opioids accounted for 47% of all fatal overdoses among young adults and adolescents from 2006 to 2015 (Ali et al., 2019). With the onset of the COVID-19 pandemic, overdoses increased according to preliminary data, but continued monitoring of the pandemic's impact on individuals with OUD is needed (Center for Disease Control [CDC], 2020; Haley & Saitz, 2020). Using the preliminary data, we know that fatal overdoses increased 21% from May 2020 to May 2021 in the U.S. (Ahmad et al., 2021).

Medication-assisted treatment (MAT) for OUD, or sometimes referred to as medication for OUD (MOUD), includes methadone, buprenorphine (BUP), and naltrexone (NTX) and is considered the gold-standard of treatment for OUD (Connery, 2015; Suba et al., 2018; Volkow et al., 2019). Traditionally, MAT requires individuals attend a clinic daily to receive their dosage. In recent years, the availability of extended-release (XR) BUP and NTX has increased potential engagement in MAT because less time-consuming, face-to-face contact is required, a benefit especially important in the

current pandemic setting (Connery, 2015). Despite these advances in MOUD, engagement in MAT is still quite low. Although MAT comprised 30.5% of all substance use treatment received by Americans over age 11 last year, only 11.2% of the 2.7 million people with OUD received MAT (SAMHSA, 2021). Most pertinent to the present study, treatment utilization has been dismal when specifically examining the population of young adults. For example, trends show that MOUD use, and XR-NTX in particular, decreased among young adults during the pandemic while overdoses continued to rise (Cremer et al., 2021).

OUD Treatment in Young Adults

Young adults are disproportionately represented in opioid misuse, and they have worse responses to treatment. Being younger is related to an increased likelihood of drop out from substance use treatment (Brorson et al., 2013; McHugh et al., 2013; Viera et al., 2020) and increased risk for relapse despite receiving the same treatment (Fishman et al., 2020; Matson et al., 2014; Schuman-Olivier et al., 2014). Treatment utilization over the past year within this group remained consistently low (11.4%) from 2002 to 2013 (Haughwout et al., 2016). Guarino and colleagues (2018) stated within their sample of young adults, the average age of initial opioid use (typically beginning with prescription opioids) was 16.8 years old and 83% of the sample progressed to using heroin within 4 years. Further, most young adults did not seek treatment until transitioning to heroin and, on average, those who reported a history of overdosing (43%) indicated the first overdose occurred within 1 year of initial heroin use (Guarino et al., 2018).

A portion of the increased substance use and poorer outcomes of young adults is simply due to the developmental stage itself (Sussman & Arnett, 2014). Smith and

colleagues (2014) examined aspects of Arnett's (2005) emerging adulthood theory, which encompasses identity exploration, self-focus, possibilities, optimism, negativity/instability, and feeling in-between, as applied to a sample of 18- to 25-year-olds in substance use treatment. They found feelings of being in-between, characterized as not yet meeting subjective, personal criteria for "real" adulthood, were positively associated with substance use-related problems. A comparison study showed poorer outcomes for emerging adults when compared to adolescents receiving the same community treatment, further illustrating the need for treatments specifically tailored to emerging adults as a distinct population (Smith et al., 2011).

Despite the overall poor outcomes for young adults who use substances, a large, national study reported that earlier treatment engagement is associated with a higher quality of life (Kelly et al., 2021). While it is essential to seek treatment early for substance use problems, young/emerging adults are more likely to drop out, and the treatment will potentially be less effective (Brorson et al., 2013; Fishman et al., 2020; Kelly et al., 2021). Connery (2015) asserted within treatment for OUD, younger age increased risk for dropout of psychosocial treatments; however, for youth receiving MAT, medication adherence and abstinence from opioid use predicted greater treatment success and retention. When looking specifically at MAT for young adults with OUD, Viera et al. (2020) highlighted individual, interpersonal, and institutional factors associated with shorter treatment retention. These factors included young age, continued substance use, and family stress; conversely, structuring treatment to be home-delivered and flexible was associated with increased retention.

Indeed, Marsch and colleagues (2016) determined youth/young adults in particular were more likely to stay in treatment if they were allowed flexibility in scheduling their treatment (i.e., daily attendance not required), which XR formulations can provide. Buprenorphine (Borodovsky et al., 2018) and XR-NTX (Fishman et al., 2010; Rozenberg, 2020) have been studied specifically within young adult populations and were determined to be effective and tolerable, though the research on XR-NTX within this age group is limited (Leslie et al., 2015; Yule et al., 2018). Despite success, drop out is still considerably high, with 52% of young adults who received injectable NTX and 70% who received oral NTX discontinuing treatment after 30 days (Morgan et al., 2018). Of those individuals who received an initial XR-NTX injection during an inpatient stay, less than 20% returned for two more dosages (Fishman, et al., 2010).

Other Factors Influencing Opioid Treatment

Variables other than age that impact opioid treatment engagement include gender (Guerrero et al., 2021; Mazure & Fiellin, 2018; Neale et al., 2014), race/ethnicity (Frederick, 2021; Pinedo et al., 2018), history of intravenous/injecting drug use (Cousins et al., 2016; Naji et al., 2016), housing-related statuses (Cousins et al., 2016; Frederick, 2021; Romo et al., 2018), criminal history, employment (Frederick, 2021; Romo et al., 2018), marital status (Romo et al., 2018), and mental illness (Cousins et al., 2016; Frederick, 2021). A study of factors that influence young adults' access to opioid treatment indicated barriers such as waitlists and lack of finances, in addition to previous incarceration and discrimination, as reasons individuals do not access treatment (Liebling et al., 2016).

Factors shown to predict relapse to opioid use include interpersonal violence (Chalana et al., 2016), more severe opioid use (including using intravenously; Chalana et al., 2016; Smyth et al., 2010; Termorshuizen et al., 2005), less education, and having no partner or a substance-using partner (Termorshuizen et al., 2005). Opioid use is a behavior influenced by various factors and cannot be explained simply. However, it is important to recognize influential factors in order to more accurately predict recovery outcomes.

Defining Recovery and Recovery Capital

Recovery, as a concept, is defined in many ways by different researchers, clinicians, and substance users, with definitions ranging from referring to a sustained, end-state goal of full abstinence from all substances to the journey, process, and/or experience of working towards decreasing reliance on substances (el-Guebaly, 2012). The Betty Ford Institute Consensus Panel (2007) agreed upon the definition of recovery as “a voluntarily maintained lifestyle characterized by sobriety, personal health, and citizenship” (p. 222), whereas SAMHSA (2011) defined recovery as “a process of change through which individuals improve their health and wellness, live a self-directed life, and strive to reach their full potential” (p. 3). In an attempt to consolidate the varied definitions of recovery, Kelly and Hoepfner (2014) advanced a reciprocal, bi-axial model of recovery defined as “a dynamic process characterized by increasingly stable remission resulting in and supported by increased recovery capital and enhanced quality of life” (p. 5).

Neale et al. (2014) shared that substance users, upon reviewing 76 measures of recovery, came to the consensus that recovery is a personal journey focused on coping

rather than curing. Similarly, the concept of recovery has been defined as the overall experience, encapsulating both the process and status of voluntarily using resources to heal physically and psychologically (White, 2007). These resources are considered *recovery capital* and include internal and external factors, originally divided into four categories: social, physical, human, and cultural (Cloud & Granfield, 2008; Granfield & Cloud, 1999). The four original categories were redefined into three categories of community, personal, and family/social capital, plus the consideration of negative capital (White & Cloud, 2008), and most recently a separate domain of health capital was proposed (Neale et al., 2014). Recovery capital is used to predict sustained recovery and increased quality of life longitudinally (Laudet & White, 2008). In theory, the more recovery capital an individual has, the more able they are to recover, highlighting the inequalities that exist while substance users attempt to decrease or abstain from substances (Cloud & Granfield, 2008). Providers have been urged to use “aggressive” outreach to engage substance users with depleted recovery capital because those individuals will have the least ability to push through barriers to receive assistance (White & Cloud, 2008).

From a review of the literature on recovery capital, Hennessy (2017) reported there is overall support for the idea. However, various categories of proposed recovery capital, in addition to inconsistent measures and definitions, complicated the model. Regardless of how the categories are defined, recovery capital can be conceptualized as a framework to discuss dynamic protective and risk factors someone may possess or obtain while recovering (Hennessy, 2017). For the purpose of this study, a broad,

transtheoretical definition of recovery capital, as a framework based on the many models and categories suggested, was used.

Further study of recovery capital in adolescent and emerging adult samples is needed (Hennessy, 2017). Literature of recovery capital in emerging adulthood has been reviewed (Elswick et al., 2018; Mawson et al., 2015; Terrion, 2013) and showed recovery capital may be even more important for the emerging adult population. Elswick and colleagues (2018) reported for emerging adults in particular, family support is important and may change throughout the course of recovery based on participants' reports. Grandfield and Cloud (2001) emphasized parents' influence on young adults' recovery capital through two examples of case studies, "Andy" and "Daria," that showed continued reliance upon parents' resources during this stage of life was essential to their individual stories of recovery. Of note, the studies reviewed were generally qualitative in nature, highlighting a dearth of quantitative research of emerging adults' experiences of recovery capital.

Severity of substance use-related problems is a separate but related concept to recovery capital, in which the two constructs intersect to change outcomes (White & Cloud, 2008; Best & Laudet, 2010). The present study examined the dynamic connection between severity of opioid use and recovery capital. It was expected aspects of recovery capital, such as relationship quality and recovery attitudes, would interact with opioid use to produce different responses to treatment.

Social Recovery Capital and Relationship Quality

Granfield and Cloud (2001) stressed the importance of the quality, in addition to quantity, of social capital an individual possesses. Social capital can take many forms, such as “favors owed to an individual, access to particular situations, emotional support, expectations held of an individual by others that foster change, preferential treatment by others, [and] trust of an individual by others” (Cloud & Granfield, 2001, p. 98).

Conversely, negative social interactions/relationships may detract from social capital in an “emotional economy,” where a person using substances may overtax their relationships and fracture them. Other research has supported the theory that social recovery capital depends not only on the presence/absence of relationships, but also the quality and dynamic of those relationships. For example, differences in quality of social life—defined as engagement with peers and meaningful activities—was the best predictor of general functioning in a sample of heroin users (Best et al., 2012). Within a review of relevant recovery capital literature, White and Cloud (2008) discussed the clinical implications of building and supporting recovery capital through substance use treatment, and social capital in particular through family-focused treatment.

Hillios (2013) also suggested social recovery capital may be the most influential area to target for treatment, as it impacted abstinence from substances and general health longitudinally. Moos and Moos (2007) reported social connections, such as bonding with family members, was associated with long-term recovery; however, many people with substance use disorders report isolation and few social connections (Neale & Brown, 2016). In multiple qualitative studies reviewed, every participant noted the importance of social support in their recovery (Wood, 2020; Best et al., 2011). Due to social capital’s

importance, Zschau and colleagues (2016) opted to conceptualize all facets of recovery capital from a social network lens within their study. Further, the social environment of a substance users' living space can dramatically influence recovery. Jason and colleagues (2021) indicated the amount of social recovery capital of a household was more predictive of relapse than individual social recovery capital.

Family Involvement in Treatment

Family members are impacted by substance use through experiencing violence, increased stress, and higher psychological and physical health symptoms, though they are often excluded from being involved in treatment (Butler & Bauld, 2005; Copello et al., 2005; Jackson et al., 2006; Orford et al., 2013). From qualitative analyses of family members' experiences, their individual sense of self and their relationships with substance-using loved ones are negatively impacted by substance use (Durkota, 2017; see Orford et al., 2010 for a review). Similar to recovery capital, resources and ability to cope with loved ones' substance use varied per family member and cultural upbringing (Orford, 2017). When compared to other samples (i.e., somatic or mental illness), the partners of individuals with substance use problems experienced worse occupational and income issues (Birkeland et al., 2017) and used more health care services than the general public (Svenson et al., 1995). Researchers from the United Kingdom estimated the economic cost per family of a substance user is around 10,000 Great British Pound (GBP) per year, including financial support (i.e., recovery capital), costs of crime, lost employment, and healthcare costs (Copello et al., 2010).

Family relationships have been cited as an important piece of recovery in the literature for decades (Liddle & Dakof, 1995; Rowe, 2012; White & Savage, 2005), with

specific emphasis on the utility of family support for young substance users (Williams & Chang, 2000). Adolescents and emerging adults are particularly receptive to integrating their families into substance use treatment because of the typical reliance on parents during these developmental phases (Hogue et al., 2021; Rowe, 2012). Vo et al. (2018) asserted that the young participants included in their study reported family support was perceived as beneficial, albeit marginally. Within a sample of youth receiving MOUD specifically, the importance of incorporating family members in treatment was highlighted (Guarino, 2009).

Relationships and Substance Use

Despite the importance of family involvement in treatment, relationships are negatively impacted by substance use. In a qualitative study of adolescent and emerging adults receiving MOUD, family relationships were described as “disintegrating” and heavily impacted by opioid use (Moore et al., 2014). The association between relationship functioning and substance use is reciprocal and strong (Ariss & Fairbairn, 2020; Rowe, 2012). Family conflict and substance use are positively correlated (Wu et al., 2004) and appear to have a bidirectional relationship, meaning they simultaneously influence one another (Kaur et al., 2019).

Positive family functioning was shown to significantly decrease the likelihood of relapse in a sample of women post-residential treatment (Ellis et al., 2004). Knight and Simpson (1996) reported in a large sample of heroin users, reductions in family conflict led to lower substance use and criminal involvement. Costantini and colleagues (1992) reported family cohesion (i.e., relatedness) as especially influential on heroin use for individuals seeking treatment. Lower family cohesion predicted higher heroin use, more

family problems, and poorer psychological functioning. For partners of substance users, quality of life was associated with perceived family cohesion, indicating this factor is important for all parties involved (Birkeland et al., 2017).

Orford (1994) proposed a transactional model of interpersonal exchanges between substance users and their families influencing substance use both positively and negatively. Theoretically, the ways in which family members cope and interact with their substance-using loved one influences the substance user and vice versa. From this model, the perceived relationship quality from the perspective of the family member is important not only because their struggles matter intrinsically, but also because their stress about the substance user may be adding to the cycle of use (Orford, 1994). This theory was supported by Butler and Bauld's (2005) study, which asserted how a family copes with substance use influences their own stress and the substance use behaviors. Denomme and Benhanoh (2017) also suggested by improving the quality of life of family members, there could be increases in the effectiveness of substance use treatment. Incorporating families into substance use treatment leads to better outcomes for family members' health and for substance user's recovery (Ventura & Bagley, 2017).

While most research on relationships' impact on substance use focuses on families, other close relationships are also influential. A meta-analysis compared substance use treatments involving significant others (i.e., family, friends, partners) to treatments that did not (Ariss & Fairbairn, 2020). They reported a notable impact of the significant others' involvement above and beyond typical treatment—a 5.7% reduction in substance use frequency that lasted up to 18 months post-treatment. The amount of support from family and friends one receives moderated the risk for relapse due to stress

in a large, longitudinal study (Dennis et al., 2007). Functional social support, including tangible and perceived support, was shown to be a modest predictor of decreased alcohol use severity after controlling for treatment variables (Dobkin et al., 2002).

Recovery Attitudes

Attitudes towards recovery from chronic mental illness have shown to impact recovery outcomes (Drake & Whitley, 2014; Stacy & Rosenheck, 2019), though the concept has been rarely applied to substance use or OUD. Barnes (2019) examined predictors of recovery attitudes in a sample of people who had not used opioids in at least one year; however, no literature was found that examined attitudes towards recovery at an earlier stage of OUD recovery.

In early recovery, expectations range from hopelessness to overconfidence—neither ends of the spectrum of which are particularly helpful in resisting relapse (el-Guebaly, 2012). Anecdotally, many practicing clinicians describe a trend of overconfidence among people who are fresh from substance use treatment, referred to as “the pink cloud” by Alcoholics Anonymous (AA), though the empirical literature supporting this phenomenon is lacking. A study of individuals in a mandated substance use detention program stated that half of their sample were “overconfident,” overestimating their ability to control their use, and relying upon external motivation for sobriety (Zhang et al., 2016). The present study measured attitudes towards recovery longitudinally to assess changes in attitudes towards recovery occur over time, perhaps from overconfidence to more realistic levels.

Attitudes towards recovery may change over time based on experiences and impulsivity (Barnes, 2019). Beliefs about recovery are also influenced by actions, as

shown in a study by Kaskutas and Ritter (2015) in which they reported individuals' definitions of recovery differed based on their self-reported recovery status. Adolescents and emerging adults specifically tend to reject viewing substance use problems as a lifelong disease, which may be related to the invincibility bias, or belief one is invulnerable to harm, youth tend to possess, but also express poor motivation and low confidence in their ability to resist relapse (Gonzales et al., 2012a; Gonzales et al., 2012b).

A Novel Intervention

The Youth Opioid Recovery Support (YORS) intervention uses assertive outreach to engage young/emerging adults with OUD in receiving XR-NTX or XR-BUP by means of home delivery of medication, contingency management, and incorporating family into treatment (Fishman et al. 2020b; Wenzel et al., 2021). Pilot studies determined the YORS intervention is more effective than treatment as usual in increasing dosages of MOUD and decreasing relapse (Fishman et al., 2020b). YORS was created with the goal of addressing the vulnerable age range of emerging adults who have higher rates of opioid use and poorer treatment outcomes (Fishman et al., 2020a; Matson et al., 2014; Schuman-Olivier et al., 2014). A treatment significant other (TSO) is incorporated into the YORS intervention by various means, such as family therapy, group text messaging, and informal coaching (Fishman et al., 2020b; Wenzel et al., 2020). Coaching of parents was suggested as a particularly beneficial method for treatment of emerging adults (Bergman et al., 2016) and involvement of TSOs in treatment may also be beneficial for their own wellbeing (Denomme and Benhanoh, 2017). From initial results, family members'/TSOs' involvement significantly improved treatment adherence and were described as

“indispensable” (Wenzel et al., 2020). Data collection on the YORS intervention was able to transition easily to a COVID-19 pandemic protocol, with home-delivered MOUD provided in a mobile van, which was considered by some participants preferable (Wenzel & Fishman, 2021).

The Present Study

The objective of this study was to examine the association between opioid use, sources of recovery capital (i.e., relationship quality and attitudes towards recovery), and treatment outcomes (i.e., MOUD utilization and decreased opioid use). It was expected that relationship quality and recovery attitudes would moderate the relation between severity of opioid use and opioid outcomes.

This study focused on a sample of emerging adults, as this demographic has the highest treatment needs and worst treatment outcomes (Fishman et al., 2020). Further, recovery capital has rarely been examined in this age range, even though certain aspects (i.e., family involvement) may be particularly relevant (Elswick et al., 2018). Family integration into substance use treatment is an important factor for adolescent substance use, though it has historically been neglected in treatment with adults (Rowe, 2012). By examining the reciprocal and transactional social recovery capital provided by TSOs/family members, this study adds to the literature through combining these variables in a novel way. Much of the literature on recovery capital is qualitative, so the quantitative design of this study also provides a different perspective of recovery from OUD.

Only one study was located that examined recovery attitudes of those with OUD, and none were found that examined this concept in this stage of early recovery (Barnes,

2019). While plenty of anecdotal evidence was reported for the phenomena of overconfidence, the literature regarding it is sparse (Zhang et al., 2016). As this study examined recovery attitudes longitudinally, it provides new insights into how attitudes toward recovery change during the early phases of recovery. It is important to note that although this study proposes hypothesized models, it was primarily exploratory in nature due to the small sample and pilot design.

Hypothesis 1: OUD severity will be negatively associated with treatment outcomes.

Hypothesis 2: Relationship quality will moderate (buffer) the relation between OUD severity and treatment outcomes. As relationship quality increases, the relation between OUD severity and treatment outcomes will become less negative.

Hypothesis 3: Recovery attitudes will moderate (buffer) the relation between OUD severity and treatment outcomes. As recovery attitudes increase, the relation between OUD severity and treatment outcomes will become less negative.

Research Question 1: Do recovery attitudes change (possibly decrease) over time? Based on the sparse literature, it is currently unknown the directionality or change over time that may occur in recovery attitudes; however, the present study seeks to explore if, based on anecdotal evidence, these attitudes may decrease rapidly in early phases of recovery.

CHAPTER II

Method

Participants

This study was a secondary data analysis of data collected for the piloting and implementation of the YORS program (Rozenberg, 2020; Wenzel et al., 2021). Emerging adults (aged 18 to 26) who were enrolled in OUD treatment at Mount Manor Treatment Center in Baltimore, Maryland, were approached to participate in the YORS program following their discharge from an acute residential treatment episode. In total, 52 individuals participated in the program during the study phase in which the present study's measures were included. Eligibility criteria for participation included misusing opioids within the 30 days prior to residential treatment, meeting Diagnostic and Statistical Manual-5 ([DSM-5] American Psychiatric Association, 2013) criteria for OUD, and identifying a person to act as their TSO (n = 38). Participants were recruited through convenience sampling and were required to speak, read, and write English sufficiently to consent to the study. Individuals with active psychosis, suicidality, abnormal liver function, and sickle cell disease were excluded from participation due to potential instability and risk. Females who were pregnant or breastfeeding during the study period were also ineligible to participate. Due to the nature of the program including home-delivered MOUD, distance of housing from the treatment center and incarceration was considered on a case-by-case basis.

Participants were given the choice between two effective MOUD, XR-NTX and XR-BUP, and half of the participants chose each MOUD. They were given their first dosage of XR-MOUD prior to discharge from their residential episode. All YORS

participants and their TSOs provided informed consent for data collection. Study procedures were approved by the Institutional Review Board (IRB) of The University of Maryland Baltimore. As the present study is a secondary data analysis design using de-identified data, the Sam Houston State University IRB provided approval for exemption prior to data analysis (# IRB-2022-358).

Measures

Opioid Use Severity

The Timeline Follow Back (TLFB) is a measure of participants' use of opioids prior to treatment (Sobell & Sobell, 1996). The interview-based assessment was used at baseline and two-week intervals during data collection. The TLFB method of assessing substance use is widely accepted within the literature and has shown to have high retest reliability, convergent and discriminant validity, and agreement with collateral information (Fals-Stewart et al., 2000). The initial data collection included many other measures of substance use activity and severity (i.e., primary route of administration, years of opioid use, number of residential treatment episodes, number of overdoses, etc.) that are related to OUD severity as well; however, exploratory analyses showed these variables were poor predictors of outcome variables in this sample. The pre-treatment TLFB data, as transformed into a proportion of days of opioid use in the past 30 (or less) days, was used as the main independent variable for this study. The proportion was calculated to account for some participants having fewer than 30 days in which they had access to opioids due to hospitalization, incarceration, or some other restricted environment.

Relationship Quality

The Significant Other Survey – Self-Administered (SOS) measured the quality of the relationship the substance user has with their TSO (Benishek et al., 2012). The SOS is an adaptation of a structured interview created by Benishek and colleagues (2006) to assess the frequency and severity of negative interpersonal events that may have occurred between the TSO and substance-using participant within the last 30 days. It consists of 54 items and asks for Likert-scale ratings of frequency (0 or *never* to 4 or *almost always*) and severity of distress (0 or *not at all* to 4 or *a great deal*) regarding various negative relationship events. According to the creators, the items are written at a 7th grade Flesch-Kincaid reading level (Benishek et al., 2012).

Areas covered assess negative events experienced by the TSO in the past 30 days, including emotional (e.g., “you had trouble sleeping”), relationship (e.g., “your loved one verbally abused you”), family (e.g., “your loved one disrupted a family gathering”), financial (e.g., “your loved one stole from you”), physical violence (e.g., “your loved one actually physically hurt you”), legal (e.g., “you dealt with legal problems related to your loved one”), and health (e.g., “you experienced your own medical problems”), which each having good internal consistency (Benishek et al., 2011); however, two total scores (for frequency and severity of distress) were used for the moderation analyses within this study, as more global issues were expected to have a deleterious effect on the substance use outcome variables. This measure had an overall internal reliability score of $\alpha = .97$ in the present sample.

Recovery Attitudes

The Recovery Assessment Scale (RAS) measured participants' self-reported views on their ability to recover from substances (Corrigan et al., 1999). The RAS is a widely-used measure of recovery and places an emphasis on self-determination (Campbell-Orde et al., 2005). It contains 41 items (e.g., "There are things that I can do that help me deal with unwanted symptoms") and uses a 5-point Likert scale from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). The RAS was originally intended to measure recovery from serious mental illness (SMI), though the adaptation of using the RAS with substance users is precedented (Cale et al., 2015; Gonzales et al., 2015). In the study by Gonzales and colleagues (2015), their sample had a mean age of 20.5 years and results showed support for good overall internal consistency, ultimately concluding that the measure has adequate psychometric properties for recovery of substance-using youth and emerging adults. Cale and colleagues (2015) reported within their sample, the participants with opioid use scored lower on the RAS than users of other substances; however, this finding did not reach statistical significance.

There are various factor structures proposed for use with SMI and substance users; however, total scores have satisfactory reliability and validity as well, so the total score was used for the present study (Corrigan et al., 1999; Gonzales et al., 2015). This measure had an overall internal reliability score of $\alpha = .91$ in the current sample. The RAS has been shown to have concurrent validity with related constructs, such as increased empowerment and quality of life (Corrigan et al., 2004), and specifically with substance users, the scores supported adequate convergent (i.e., self-efficacy, mental health) and discriminant validity (i.e., substance use, behavioral issues; Gonzales et al.,

2015). Of note, while a measure of recovery attitudes exists—the Recovery Attitudes Questionnaire (RAQ-7; Borkin et al., 2000)—there are serious psychometric concerns of its consistency and validity (Jaeger et al., 2013).

Treatment Outcomes

Days of opioid use during the study and number of XR-MOUD dosages received served as the outcome variables. The days of opioid use during the study was calculated through a combination of within-study TLFB data and urine drug screening (UDS) results. The UDS tests used can detect synthetic opioids, such as Oxycodone and fentanyl, and were administered to participants every two weeks, along with the TLFB (Wenzel et al., 2021). A missed UDS or a UDS with a result positive for opioids was considered as 5 days of opioid use. If the self-reported number of days of opioid use was higher than 5 from the TLFB, the higher number was taken. This method of calculating days of use during the study window is consistent with the primary investigators' data analysis plan in pilot studies of YORS. Having more days of opioid use was considered an indicator of poorer treatment outcomes.

One of the primary goals of the YORS program is to increase XR-MOUD engagement in emerging adults, therefore the number of dosages received served as the best measure of this aspect. XR-BUP and XR-NTX were, in theory, administered once a month for the 12-week study period; however, in reality, many participants did not receive every dosage. Receiving less dosages signified poorer treatment outcomes.

CHAPTER III

Results

Demographics and Descriptive Statistics

Participant demographics are presented in Table 1 below. It should be noted that 22 participants did not provide ethnicity data. Of note, months employed was a bimodal distribution with peaks at 0 months and 12 months worked in the past year. Half of participants (26) used opioids daily prior to entering residential treatment. Of the 52 total participants, 5 withdrew from the study prior to receiving any dosages of XR-MOUD.

Table 1

Participant Demographics (n = 52)

Demographic	M ± SD or Frequency	Percentage
Age	24.29 ± 1.76	
Sex		
Male	46	88.5%
Female	6	11.5%
Race		
White	40	76.9%
Non-White	12	23.1%
Subjective SES	4.40 ± 1.76	
Homelessness in past year		
Yes	21	40.4%
No	31	59.6%
Months employed in past year	6.39 ± 4.38	
Overdoses	3.58 ± 5.20	
Arrests	6.25 ± 8.14	
Residential treatment episodes	3.65 ± 3.59	
Years of opioid use	7.15 ± 3.44	
Intravenous opioid use		
Never	24	46.2%
Yes, not main ROA	19	36.5%
Yes, main ROA	9	17.3%
MOUD provided		
XR-BUP	25	48.1%
XR-NTX	27	51.9%

(continued)

Demographic	M ± SD or Frequency	Percentage
Doses received	2.60 ± 1.50	
0	11	21.1%
1	8	15.4%
2	5	9.6%
3	8	15.4%
4	20	38.5%

Note. ROA = route of administration; MOUD = medication for opioid use disorder;

XR-BUP = extended-release buprenorphine; XR-NTX = extended-release naltrexone.

Pearson bivariate correlations and ANOVAs were conducted to examine the effects of potential covariates, such as age, socioeconomic status (SES), months employed, overdoses, arrests, residential treatment episodes, race, sex, homelessness, and mandated status. Only number of arrests was significantly positively correlated with days of use, $r(47) = .29, p < .05$, and was therefore entered into subsequent analyses. Of note, number of arrests was not associated with the outcome variables in the regression analyses.

Number of overdoses was positively correlated with years of opioid use ($r = .35$) and number of residential treatment episodes ($r = .58$), but negatively associated with frequency of negative interpersonal events (SOS-A; $r = -.33$). Number of residential treatment episodes was positively correlated with years of opioid use ($r = .41$) and was negatively correlated with SOS-A ($r = -.48$) and severity of distress regarding negative interpersonal events (SOS-B; $r = -.39$). Other significant correlations included a positive relation between age and baseline recovery attitudes ($r = .37$), a negative correlation between RAS scores and days of use outcome ($r = -.33$), a negative association between SES and pre-treatment opioid use severity ($r = -.32$), and lastly, a negative correlation between the two outcome variables of dosages received and days of use ($r = -.65$).

Hypothesis Tests

Skewness and kurtosis were measured for the main variables of interest, and all fell within acceptable limits. A square root transformation and log transformation were conducted on the independent variable to check for potential improvement in skewness and kurtosis, but ultimately the original proportional pre-treatment TLFB data was used (skewness = -1.62, kurtosis = 1.40). Moderation analyses were conducted using the PROCESS macro model 1 (Hayes, 2017). There were no partially incomplete measures, and therefore no adjustments were made to accommodate missing data. All participants completed the baseline RAS measure, 38 TSOs completed the baseline SOS measure, and 28 participants completed the follow-up RAS measure. Only nine TSOs completed the SOS at follow-up, so no longitudinal analysis was conducted for relationship quality.

It was predicted that the relationship between pre-treatment opioid use and MOUD dosages received would be moderated by relationship quality and recovery attitudes. The results of the moderation analyses with dosages received as dependent variable are contained within Table 2 for reference, as none were significant.

Table 2

Results of Moderation Analyses with Dosages Received as Dependent Variable

Moderator	B	<i>t</i>	df	<i>p</i>	CI Lower	CI Upper
RAS	.01	.21	43	.59	-.02	.03
RAS Change	-.01	-.64	24	.53	-.04	.02
SOS-A	.00	.57	33	.57	-.01	.02
SOS-B	.00	-.13	33	.89	-.01	.01

Note. CI = 95% confidence interval. OUD severity was independent variable for all analyses.

To assess if recovery attitudes changed over time for the 28 participants who provided RAS data at baseline and follow-up, a dependent subjects t-test was used. The t-test did not yield a significant result, $t(27) = -1.09, p = .29$. We calculated a variable representing change in recovery attitudes by subtracting the time 1 from time 2 score. This variable was then entered in a regression model as a moderator variable (described below). Those who had an increase in RAS over time ($n = 17$) did not significantly differ from those who had a decrease in RAS over time ($n = 10$) on number of dosages received, $t(25) = -.92, p = .43$, or days used, $t(25) = .54, p = .60$. Only one participant had no change in RAS over time.

Table 3

Results of Baseline RAS Moderator

Variable	B	SE	t	p	CI Lower	CI Upper
ODU Severity	10.33	7.70	1.34	.19	-5.21	25.87
RAS Base	-.23	.13	-1.72	.09	-.49	.04
Interaction	-1.14	.45	-2.51	.02	-2.05	-.22
Arrests	.51	.27	1.86	.07	-.04	1.07

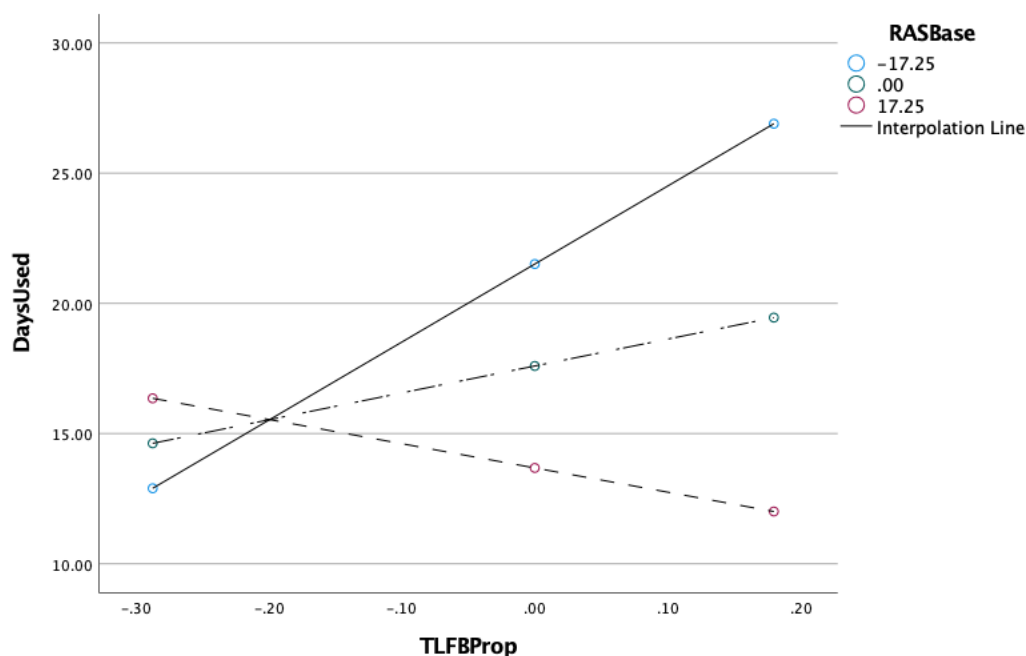
Note. CI = 95% confidence interval. OUD severity was independent variable, days

of opioid use was dependent variable, and arrests was entered as a covariate.

Baseline RAS was a significant moderator of the relation between initial opioid use and days of use during the study, shown above in Table 3, both in the overall model, $R^2 = .30, F(4, 42) = 4.47, p < .05$, and interaction, $B = -1.14, t(42) = -2.51, p < .05$, (CI = -2.05, -.22). As expected, having more internal recovery capital lessens the impact of OUD severity on treatment outcomes. For those with more pessimistic recovery attitudes at baseline, OUD severity was positively associated with days of use, but for participants with more optimistic recovery attitudes, there was no relationship between the independent and dependent variables. Refer to Figure 1 for a visual representation.

Figure 1

Visualization of Moderation of Days of Use by Baseline RAS



Note. TLFBProp = OUD severity (independent variable); RASBase = RAS at baseline (moderator); DaysUsed = day of opioid use (dependent variable).

Table 4

Results of Change in RAS Moderator

Variable	B	SE	t	p	CI Lower	CI Upper
OUD Severity	8.13	11.10	.73	.47	-14.77	31.04
RAS Change	.16	.24	.68	.50	-.33	.65
Interaction	1.58	.68	2.32	.03	.17	2.98

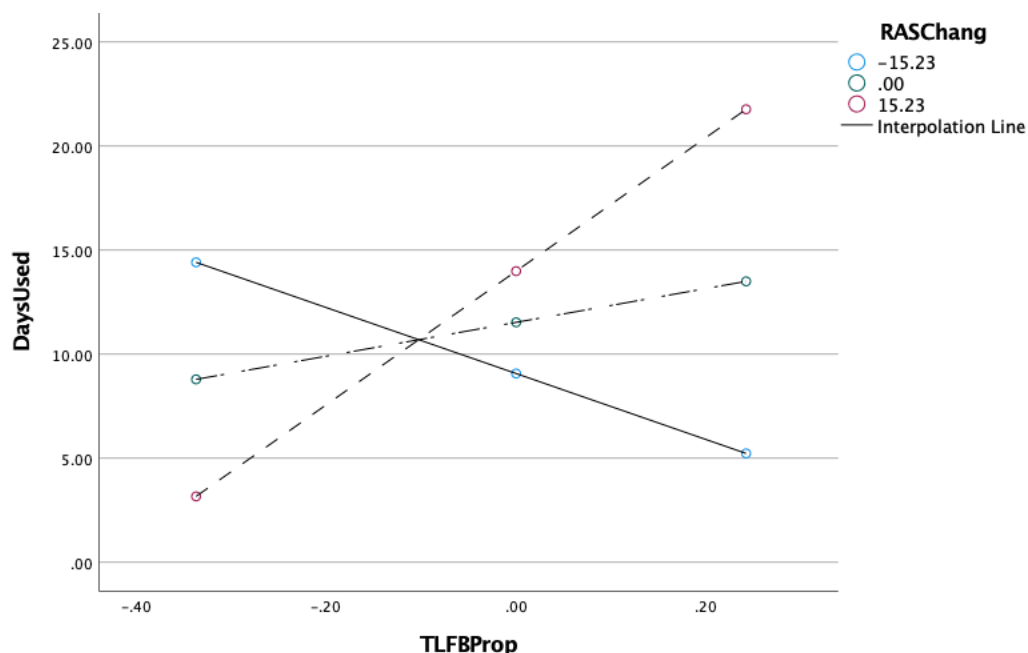
Note. CI = 95% confidence interval. OUD severity was independent variable and days of opioid use was dependent variable.

Change in RAS moderated the relationship between initial opioid use and days of use during the study, shown above in Table 4. Depending on the shift in recovery attitudes, whether positive or negative, the association between OUD severity and treatment outcomes differed. Interaction results were significant, $B = 1.58$, $t(24) = 2.32$, $p < .05$, (CI = .17, 2.98), meaning that for those whose recovery attitudes became more

pessimistic over time, the relationship between OUD severity and days of use was not significant. However, for those whose recovery attitudes became more optimistic over time, OUD severity is positively correlated with days of use. Refer to Figure 2 for a visual representation.

Figure 2

Visualization of Moderation of Days of Use by RAS Change



Note. TLFBProp = OUD severity (independent variable); RASChang = change in RAS score (moderator); DaysUsed = day of opioid use (dependent variable).

Table 5

Results of SOS-A Moderator

Variable	B	SE	t	p	CI Lower	CI Upper
OU D Severity	-3.02	10.01	-.30	.77	-23.43	17.38
SOS-A	.05	.09	.56	.58	-.14	.24
Interaction	-.55	.26	-2.09	.04	-1.08	-.01
Arrests	.63	.36	1.74	.09	-.11	1.37

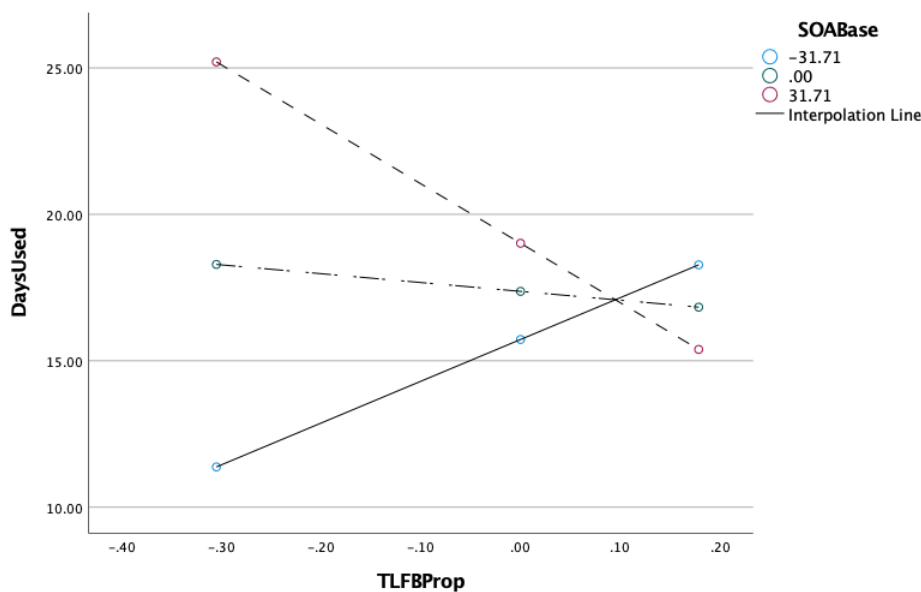
Note. CI = 95% confidence interval. OUD severity was independent variable, days

of opioid use was dependent variable, and arrests was entered as a covariate.

SOS-A moderated the relationship between OUD severity and days of use, as shown above in Table 5. Frequency of negative relationship events, as a measure of relationship quality, combines with initial opioid use to impact treatment outcomes. Interaction results were significant, $B = -.54$, $t(32) = -2.09$, $p < .05$, (CI = -1.08, -.01). Of note, no statistical significance transition points were observed within the range of the moderator, and standard errors were large, suggesting a moderating effect but with no statistically significant areas without overlapping standard errors. Refer to Figure 3 for a visual representation. SOS-B approached significance with a similar pattern, $B = -.42$, $t(32) = -1.92$, $p = .06$.

Figure 3

Visualization of Moderation of Days of Use by SOS-A



Note. TLFBProp = OUD severity (independent variable); SOABase = SOS-A at baseline (moderator); DaysUsed = day of opioid use (dependent variable).

An exploratory analysis of change over time in days of opioid use was conducted following the moderation analyses in order to more thoroughly assess the relation between recovery attitudes and days of use. Because days of use prior to and during the study were different durations of time, both were changed into z-scores and a variable was calculated representing change in recovery attitudes by subtracting the time 1 (proportional days used prior to entering treatment) from time 2 score (days of use during the study). 22 participants' z-scores decreased over time, 24 increased over time, and 1 remained the same. Of note, five participants reported using opioids every possible day prior to entering treatment and had zero days of opioid use during the study time frame. The change over time in opioid use variable was then examined in correlation with recovery attitudes at baseline ($r = -.23, p = .12$) and over time ($r = -.04, p = .83$), though neither were significant.

CHAPTER IV

Discussion

The primary aim of this study was to examine the relation between opioid use and recovery capital. It was expected that aspects of recovery capital, namely relationship quality and recovery attitudes, would interact with opioid use to buffer the association between initial opioid use and treatment outcomes. Previous literature has suggested the population of emerging adults is distinct from both adolescents and adults, and yet recovery capital has rarely been examined in this group.

Recovery Attitudes

Recovery attitudes was the sole predictor variable that was significantly correlated with days of use ($r = -.33, p < .05$). Baseline attitudes toward recovery buffered the relation between initial opioid use and opioid use during the study period. This finding supported the hypothesis that having more internal recovery capital (i.e., positive beliefs about your ability to recover from opioid use) provides an individual with more self-efficacy to change their opioid use.

Recovery attitudes were found to change over time. Though literature is sparse on this topic, anecdotal evidence of a “pink cloud” of overconfidently high recovery attitudes at baseline (i.e., upon completion of a residential treatment program) was expected to perhaps decrease by the follow-up assessment of recovery attitudes. The findings of this study did not support a uniform direction of change in recovery attitudes or find that those who had increased versus decreased recovery attitudes differed significantly, possibly due to being underpowered to find such a result, if it exists in this sample. However, the vast majority (all but one participant) who provided longitudinal

data on recovery attitudes had a change, either positively ($n = 17$) or negatively ($n = 10$), in their attitudes toward recovery during the study period. This is a novel finding that recovery attitudes in early recovery seem to change rapidly and appear to have a moderating effect on treatment outcomes as well. That is, for those who developed more pessimistic attitudes over time, their initial opioid use was unrelated to their use during the study. This group may include some who experienced a “pink cloud” effect, though it cannot be determined by this study at what level of recovery attitudes is considered “overconfident” in order to draw such a conclusion. For those who developed more optimistic attitudes, their initial opioid use was related to their use during the study. However, this analysis alone could not determine if days of opioid use changed over time with recovery attitudes. Follow-up correlations did not yield a significant relation between change in days of opioid use with either recovery attitudes at baseline or over time. This finding could suggest there is no impact of recovery attitudes on change in days of opioid use, but when examined in combination with the significant moderation findings of baseline recovery attitudes, it may be best to determine that the data are inconclusive, and replication is needed to clarify whether a relation exists.

Relationship Quality

Regarding social recovery capital, the moderating effect was less impactful and in an unexpected direction. It was hypothesized that social recovery capital, conceptualized as relationship quality between participants and their TSOs, would buffer the relation between initial opioid use and treatment outcomes. This would mean that, due to the measure of relationship quality assessing negative relationship events (i.e., abusive interactions, theft, etc.), it was expected that fewer negative incidents and lower distress

regarding such incidents would dampen the impact of OUD severity on treatment outcomes. However, findings that approached significance suggested more frequent and more distressing negative relationship events actually buffered the association between initial opioid use and days used during the study. A potential explanation for this finding is that although the SOS measures negative relationship events, other factors influencing relationship quality, such as relationship closeness or volatility, may be confounding the results. The negative correlation between number of overdoses and frequency of negative relationship events, as well as number of residential treatment episodes and frequency and distress regarding negative relationship events, further suggests that the present study's measure of relationship quality may have been insufficient on its own.

No measure of positive relationship events was included in the present study, so it cannot be determined if those with more frequent negative and positive relationship events (i.e., higher volatility) than those who were reported less frequent negative relationship events. The closeness of the relationships for the TSOs who reported less frequent and less distressing negative relationship events also cannot be determined in the present study. It may be that those who reported less distress and fewer negative events have reached a point of detachment with their substance-using loved one. The SOS measure was likely inadequate for drawing conclusions in regard to social recovery capital, and further research with additional concepts related to interpersonal support (i.e., closeness, supportiveness, etc.) is warranted.

Comparison of Putative Moderating Variables

Recovery attitudes provided a more robust moderating effect than relationship quality, potentially suggesting that recovery attitudes are a more important source of recovery capital for emerging adults than that provided by social support. This finding adds to the literature regarding emerging adulthood and its unique transitory phase of gaining independence. Of note, the sample of this study skewed on the older end of the emerging adulthood period with an average age of approximately 24 years, which may have also contributed to the lessened impact of parental TSO influence. Future studies should examine the impact of recovery attitudes compared to social recovery capital (particularly from family members) in both adolescent and adult samples in order to continue illuminating the niche of emerging adulthood and recovery. Examining social recovery capital from several sources apart from family members for emerging adults may also provide a fuller picture, as it could be that other relationships are more influential. Future studies may also consider including a measure of emerging adulthood, such as the Inventory of Dimensions of Emerging Adulthood (Reifman et al., 2007), to examine sample's representativeness of that developmental phase.

Of the two treatment outcome variables, days of use and dosages received, the latter yielded no significant findings. It may be that recovery capital has less of an impact on receiving MOUD than on using opioids; however, this is less likely when considering the strong negative correlation between the outcome variables ($r = -.65, p < .01$). Over the 12 weeks of the study, the participants were offered four dosages of MOUD.

Therefore, it is more likely that the restricted range of 0 to 4 possible dosages received, in

addition to the limited sample size, may have contributed to the lack of findings regarding this outcome.

Limitations and Future Directions

Several limitations regarding the interpretation of the findings of this study should be noted. First, the study was underpowered due to the small sample size. The initial piloting for the YORS intervention included several waves of data collection; however, the measures given during those data collections differed and only 52 participants received both the RAS and SOS measures. The present study was primarily exploratory in nature due to the limited sample size and small literature base, particularly in the area of recovery attitudes for OUD.

As mentioned previously, the measure of relationship quality for social recovery capital did not perform as expected. It is important to note that the measure was adapted from a structured interview, which was previously shown to have scores impacted by demographic variables and the nature of the relationship to the substance user. For instance, a female partner who is living with the substance-using loved one would be expected to report more problems than a parent who does not live with them (Benishek et al., 2011). No demographic information about TSOs was collected in the study, though anecdotally the primary investigators reported most TSOs were parents. Conclusions regarding relationship quality in this study are also restricted by having only TSOs perspective on the relationship, which may differ from that of the participant. It is possible that the unexpected findings are due to mismatched views on the quality of the relationship between participants and their TSOs, which is an area worthy of future study.

Though longitudinal data was collected at 12 weeks, the follow-up rates were 53% for the RAS measure completed by participants and only 23% for the SOS measure completed by TSOs. The low follow-up rates for TSOs may suggest a floor effect, meaning the majority of TSOs included in the study may have provided low social support for the participant overall and thereby impacted the amount of social recovery capital received and measured. It is also impossible to know from the current data if there were any non-random patterns to TSO disengagement (i.e., more distressed TSOs disengaging more quickly, etc.) and participant dropout.

Lastly, the independent variable of pre-treatment opioid use was not significantly correlated with treatment outcomes despite previous findings that indicate they would be related (Chalana et al., 2016; Smyth et al., 2010; Termorshuizen et al., 2005). The decision to use TLFB data of pre-treatment opioid use as the indicator of OUD severity was supported by the literature; however, there is no true consensus on how best to define OUD severity. A construct of other factors related to OUD severity and relapse risk (i.e., number of overdoses, years of opioid use, intravenous opioid use, and number of residential treatment episodes) was also explored as a potential independent variable but also was not significantly associated with treatment outcomes. In measuring OUD severity for a sample from residential treatment, restricted range and a ceiling effect are potential concerns. It is possible that the entire sample falls on the “severe” end of the OUD severity spectrum, as suggested by the negative skew of the distribution of initial opioid use, though skewness and kurtosis were within an acceptable range. Further research is required to unify the field in deciding a common measurement method for determining OUD severity.

A future study utilizing this sample's rich, longitudinal data could apply survival analysis to explore at what point individuals used opioids in the study period and if time until use differs as a factor of any aspect of recovery capital. Identifying changing recovery attitudes over time and the point at which participants first used opioids during the study may also yield interesting findings.

More research is needed with larger samples to replicate the findings of this study, as well as determine larger-scale patterns in changes over time of recovery attitudes. Measuring recovery attitudes more frequently throughout a longitudinal study would also assist in determining how soon recovery attitudes begin to shift, and if in a longer study, when they become stable into longer-term recovery. More literature on the impact of initial recovery attitudes is also required to determine if there is an overconfidence effect from recovery attitudes, which could potentially be defined by comparing participants' individual risk factors and OUD severity with their recovery attitudes.

Conclusions

Overall, this study illuminated some of the ways in which aspects of social recovery capital and recovery attitudes impact opioid use for emerging adults. While this study was exploratory in nature, future research can build upon the findings that recovery attitudes change quickly during the initial phase of recovery and reduce the impact of OUD severity on continued opioid use. As the body of literature on recovery capital grows, we hope that more researchers will continue to identify other factors that are influential for the vulnerable group of emerging adults using substances.

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APPENDIX

IRB Approval

Date: 2-2-2023

IRB #: IRB-2022-358

Title: Impact of Relationship Quality and Recovery Attitudes on Medication-Assisted Treatment for Opioid Use Among Emerging Adults

Creation Date: 11-18-2022

End Date:

Status: **Approved**

Principal Investigator: Emma Anderson-White

Review Board: SHSU IRB

Sponsor:

Study History

Submission Type	Initial	Review Type	Exempt	Decision	Exempt
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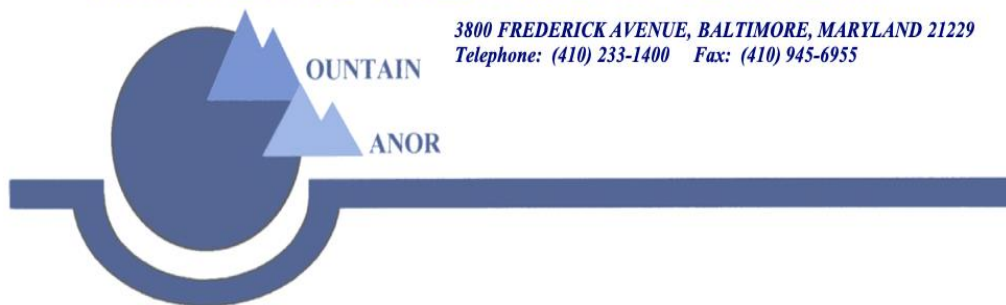
Key Study Contacts

Member	Emma Anderson-White	Role	Principal Investigator	Contact
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Member	Emma Anderson-White	Role	Primary Contact	Contact
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Member	Craig Henderson	Role	Co-Principal Investigator	Contact
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MARYLAND TREATMENT CENTERS



3800 FREDERICK AVENUE, BALTIMORE, MARYLAND 21229
Telephone: (410) 233-1400 Fax: (410) 945-6955

November 18, 2022

Re: SHSU IRB

To Whom It May Concern,

We are giving permission for the researchers at Sam Houston State University (SHSU), Emma Anderson-White and Dr. Craig Henderson, to utilize our dataset for the purpose of Emma Anderson-White's dissertation project, *Impact of Relationship Quality and Recovery Attitudes on Medication-Assisted Treatment for Opioid Use Among Emerging Adults*, and future conference presentations or publications regarding this project.

The dataset used for this study was compiled over three previous studies that were approved by Johns Hopkins University IRB (IRB00144092), University of Maryland Baltimore IRB (HP-00085682), and WCG IRB (20193366).

We will provide the SHSU researchers with the data through an encrypted email, and the dataset itself will be password protected. Once the dissertation project is completed, we request the SHSU researchers destroy the dataset they received and dispose of it from their hard drives.

Should the IRB require additional information or have further questions regarding the dataset, please do not hesitate to contact us.

Thank you,

A handwritten signature in black ink, appearing to read 'Kwenzel', is positioned above the typed name.

Kevin Wenzel, Ph.D.
Director of Research
Maryland Treatment Centers

MANUSCRIPTS IN PREPARATION/UNDER REVIEW

Henderson, C.E., **Anderson-White, E.**, Gebhardt, C.S., Krembuszewski, B., Mollenkopf, K., Crosby, J., Henderson, S.E., Smith, T., & Frampton, A. *Daily variation in religious behavior, spiritual experiences, alcohol use, and life satisfaction among emerging adults* [Manuscript under review]. Department of Psychology and Philosophy, Sam Houston State University.

Anderson-White, E., Krembuszewski, B., Henderson, C. E., White, S., & Ratcliff, C. *Motivation in a Methadone Maintenance Treatment Program from a Self-Determination Theory Framework* [Manuscript in preparation]. Department of Psychology and Philosophy, Sam Houston State University

PEER-REVIEWED CONFERENCE PRESENTATIONS

Krembuszewski, B., **Anderson-White, E.**, & Henderson, C. E. (2023, March). *The effect of criminal involvement on motivation to attend methadone treatment*. [Poster presentation]. Poster to be presented at the annual convention of the American Psychology-Law Society, Philadelphia, PA.

Krembuszewski, B., **Anderson-White, E.**, Henderson, C. E. (2022, March). *How Race and Sex Affect Criminal Justice Involvement and Treatment Outcomes for Individuals with Opioid Use Disorder* [Poster presentation]. Presented at the annual convention of the American Psychology-Law Society, Denver, CO.

Anderson-White, E., Krembuszewski, B., Henderson, C. E. (2021, August). *Comparisons of Treatment Attendance and Substance Use in Methadone Maintenance Treatment Sample* [Poster presentation]. Presented at the annual convention of the American Psychological Association, virtual.

Krembuszewski, B., **Anderson-White, E.**, & Henderson, C. E. (2021, August). *The impact of criminal justice involvement on outcomes of outpatient methadone treatment* [Poster presentation]. Presented at the annual convention of the American Psychological Association, virtual.

Anderson-White, E., Sze, Cody, & Krembuszewski, B., (2021, February). *Deaf Culture and Identity Development* [Workshop presentation]. Presented at the Diversity Leadership Conference at Sam Houston State University, Huntsville, TX.

Krembuszewski, B., Hillegass, C., & **Anderson-White, E.** (2021, February). *Environmental and mental health concerns for Native Americans and Indigenous people* [Workshop presentation]. Presented at the Diversity Leadership Conference at Sam Houston State University, Huntsville, TX.

Craig Henderson, C., Young, C. M., Christensen, M., **Anderson-White, E.**, Sze, C., Najjar, L., Leasure, J. L., & Neighbors, C. (2020, November). A latent class

analysis of correlates of college student alcohol use and physical activity group membership. In J. Holt (Chair), *Evidence-Based Interventions for College Student Health Behaviors: Improving Buy-In and Navigating Barriers to Implementation* [Symposium]. Presented at the Annual Meeting of the Association for Behavioral and Cognitive Therapies, Philadelphia, PA.

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

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 presentation]. Presented at the annual convention of the American Psychological Association, virtual.

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?* [Workshop presentation]. Presented 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 presentation]. 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 presentation]. 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 presentation]. 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* [Workshop presentation]. Presented 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 presentation].

Presented at the annual convention of Southwestern Psychological Association, Houston, 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* [Paper presentation]. Presented 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 presentation]. Presented at the annual convention of Southwestern Psychological Association, Dallas, TX.

RESEARCH EXPERIENCE

Aug 2018—Present

Graduate Research Assistant

Diversity and Health Behaviors Lab

Sam Houston State University

Supervisor: Craig Henderson, Ph.D.

- Oversee two longitudinal research studies using pedometer technology
- Provide participant orientation sessions
- Clean and analyze longitudinal databases
- Train and manage undergraduate research assistants
- Coordinate research activities for a federally-funded research project
- *Informing Prevention by Modeling Associations Between Physical Activity and Alcohol Consumption*

Grant #R21 AA026380 (\$275,000)

PI: Clayton Neighbors, Ph.D.

Site Supervisor: Craig Henderson, Ph.D.

Aug 2015—Aug 2018

Undergraduate Research Assistant

Cross-Cultural Attachment Research Lab

University of North Texas

Supervisor: D.C. Wang, Ph.D.

- Conducted structured interviews of children of immigrant parents
- Transcribed interviews to obtain qualitative data
- Collected survey data
- Developed and maintained SPSS databases

- Performed Consensual Qualitative Research (CQR) methods

Oct 2015—Dec 2017

Undergraduate Research Assistant

Motivational Science Lab

University of North Texas

Supervisor: Rex Wright, Ph.D.

- Collected data via survey and task administration
- Biomonitored blood pressure, heart rate, and EKG

HONORS, AWARDS, & SCHOLARSHIPS

June 2021

R13 Travel Award

National Institute on Drug Abuse

Awarded by: Bettina Hoepfner, Ph.D.

\$750

Aug 2020; March 2022

Graduate Student Travel Award

Sam Houston State University

\$1,000

Dec 2017

Distinguished Honors College Scholar Award

University of North Texas

2014—2017

President's List

University of North Texas

2014—2017

Excellence Scholarship I

University of North Texas

\$32,000

Dec 2014

Outstanding Psi Chi Member

University of North Texas

PROFESSIONAL MEMBERSHIPS

- 2022** Association for Behavioral and Cognitive Therapies
- 2021** SHSU Clinical Psychology Program Diversity Committee
- 2021** APA Division 41: American Psychology—Law Society
- 2019** APA Division 50: Addiction Psychology
- 2019** APA Association of Graduate Students
- 2019** American Psychological Association
- 2019** Sam Houston Area Psychological Association
- 2018** Texas Psychological Association
- 2015** Southwestern Psychological Association

2014 Psi Chi Honor Society in Psychology

LEADERSHIP EXPERIENCE

Aug 2022—Present	Secretary <i>Program Diversity Committee</i> Sam Houston State University
Sept 2021—Aug 2022	Newsletter Content Curator <i>Program Diversity Committee</i> Sam Houston State University
2016—2017	President <i>Psi Chi Honor Society in Psychology</i> University of North Texas
2015—2016	Vice President <i>Psi Chi Honor Society in Psychology</i> University of North Texas
2014	Vice President of Fundraising <i>Psi Chi Honor Society in Psychology</i> University of North Texas