

Social-Ecological Predictors of Criminal Recidivism for Adults on Probation and Parole

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ON PROBATION AND PAROLE

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DEDICATION

There are so many people in my life that have paved the way for the culmination of this difficult, yet wonderful, journey, that I would be remiss to dedicate my dissertation to just a single person. I would be remiss if I did not thank the people who have been there since the start: my parents. Mom and Dad, how would I have ever even begun this journey without you? Dad, your support and humor have helped to keep my spirits up throughout this process. Mom, your endless generosity and kindness have inspired the kind of professional and person I always strive to be.

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Finally, my dissertation project itself is dedicated to my brother-in-law, Michael, and to my husband and his family that lost Michael far too soon. If this project can save one life, it would be enough.

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ABSTRACT

Nearly 9 million felony crimes are committed annually in the United States by adults (Federal Bureau of Investigation, 2018). These crimes often have negative consequences for victims (e.g., mental and physical health problems, loss of productivity at work; Golladay & Holtfreter, 2017; Peterson, et al., 2018) and taxpayers (e.g., cost of law enforcement, maintenance and expansion of the correctional system; McCollister et al., 2010). Unfortunately, efforts to rehabilitate felony offenders have been met with limited success, with nearly half of former offenders being rearrested within a year after being placed on probation or parole (United States Sentencing Commission, 2016). Thus, it seems reasonable to suggest that research that identifies risk factors for recidivism should be a priority. Although researchers have identified a number of social-ecological (i.e., individual, family, peer, workplace, neighborhood) risk factors that are linked with repeated criminal activity in adults, this work has generally focused on these risk factors in isolation rather than conjointly. In the present study, 101 individuals on probation and parole completed self-report measures pertaining to their individual functioning, family and peer relations, workplace qualities, and neighborhood characteristics at baseline (Time One). Six months later (Time Two), participants' criminal activity (i.e., misdemeanors, felonies) was tracked through publicly available court records as an index of recidivism. Logistic regression models indicated that lower levels of family support and neighborhood safety at Time One were linked with higher levels of criminal involvement (i.e., misdemeanors, felonies, any crime) at Time Two. The results of this study suggest that developers of treatments for individuals in the criminal justice system should include interventions that focus on family support and neighborhood safety.

CHAPTER 1: INTRODUCTION

Felony offenses committed by adults often have serious consequences for victims (e.g., mental health, physical health, and employment problems; Golladay & Holtfreter, 2017; Peterson, et al., 2018), taxpayers (e.g., cost of law enforcement, expanding and maintaining the correctional system; McCollister et al., 2010), and offenders themselves (e.g., higher mortality rates, joblessness; Graffam et al., 2008; Patterson, 2010). Moreover, of the 4.5 million adult felony offenders placed on probation and parole annually in the United States, approximately 50% will be arrested within the following year (United States Sentencing Commission, 2016). This arrest statistic is especially disturbing in light of evidence that arrest records are an underestimate of the actual number of crimes committed by offenders (Elliott, 1995; Farrington et al., 2009). Furthermore, the high rate of recidivism would seem to suggest that rehabilitation programs for criminal offenders have not been successful. Thus, to develop efficacious interventions, it seems imperative to develop an empirical base regarding the risk factors that contribute most to continued criminality among adults in the justice system.

There are several popular theories pertaining to the causes and correlates of criminal behavior in adults. For example, the criminalization theory (Abramson, 1972; Mulvey & Schubert, 2017; Teplin, 1984) posits that mental health problems (e.g., difficulties with impulsivity and emotion regulation) in adults are important risk factors for criminal activity by placing individuals at greater risk of committing antisocial behaviors. Other theories have focused on the role that personality traits play in criminal behavior. For example, some theorists have proposed that psychopathic personality traits can explain most antisocial behaviors because individuals with these traits have poor

behavioral control, limited prosocial attitudes and behaviors (e.g., obeying laws, helping others), and a lack of guilt (DeLisi, 2009). Still other theories have focused on broader elements of an offender's social ecology to explain adult criminal activity. For example, systemic theorists have hypothesized that low social cohesion among neighborhood residents, including a lack of willingness to act for the collective good, contributes to adult criminality (Bursick, 2000; Sampson et al., 1997). Although there is some empirical support for each of these widely held theories, these theories have been criticized as too narrow because they fail to reflect the multiple variables that have been linked with criminal behavior in adults (see Epperson et al., 2014).

To develop a more adequate understanding of the causes and correlates of criminality in adults, it seems most efficacious to adopt a multifaceted theory of human behavior that is consistent with extant research. Indeed, the theory of social ecology (Bronfenbrenner, 1994) would seem to provide a useful framework for understanding both criminality and criminal recidivism in adult offenders. This theory posits that individuals are nested within interconnected social systems, including immediate and extended family members, friends and acquaintances, workplace associates, and neighborhood residents. From this perspective, the individual's behavior is viewed as being shaped by his/her interactions within these social systems and by the complex interplay between the systems (e.g., between an individual's family members and peers). Thus, it is assumed that the individual can be influenced by problematic transactions within any given system or between different systems.

Existing Research on Social-Ecological Risk Factors for Criminality in Adults

As noted above, the theories pertaining to risk factors for criminality in adults have largely focused on single variables (e.g., individual, family, peer, or neighborhood systems) within an offender's social ecology. In this section, I review what is currently known about risk factors for criminal offending (including recidivism) during adulthood at the levels of different systems. Then, I summarize the limited research literature attesting to the multidetermined nature of criminal recidivism for adult offenders. It should be noted that much of the existing literature has methodological limitations, including the use of measures without demonstrated reliability or validity (e.g., single-item measures, archival data) and a lack of temporal precedence between measures of risk factors and criminal offending. These limitations are noted throughout this section.

Individual Characteristics

Several individual-level variables have been linked with an increased risk for the onset and continuation of criminal activity in adults. For example, mental health problems are a widely noted risk factor for criminality, and researchers have estimated that more than half of all individuals in the criminal justice system have a serious mental illness (e.g., schizophrenia, bipolar disorder; James & Glaze, 2006). Moreover, several studies have demonstrated that mental health problems in adults in the criminal justice system greatly increase their risk of rearrest (Constantine et al., 2010; Sadeh & McNeil, 2014). Thus, it would appear that mental health needs are a contributing factor to continued criminal offending for adults on probation and parole.

Substance use/abuse poses another risk factor for continued criminality among individuals with justice system involvement. Indeed, in 2017, nearly 30% of all crimes

committed by adults were related to drug or alcohol use and abuse (Federal Bureau of Investigation, 2020). Furthermore, in an earlier study, approximately 25% of victims of violent crimes believed that their attacker was under the influence of drugs or alcohol at the time of the attack (Bureau of Justice Statistics, 2006). These findings are consistent with other research showing that alcohol or drug problems are a significant risk factor for criminal recidivism in adults (Dowden & Brown, 2002).

There is also evidence that co-occurring mental health problems and substance use pose an even greater risk for recidivism in adults than does either risk factor alone. For example, Wilson et al., (2011) found that formerly incarcerated offenders who had co-occurring mental health and substance use problems were at greater risk of being readmitted to jail four years following release than were offenders with only mental health problems or only substance use problems; in fact, nearly 70% of the offenders with co-occurring problems recidivated in this study. Thus, it appears that having both substance use and mental health problems heightens the risk of continued criminal behavior in adults.

Several researchers have also reported that personality traits, particularly psychopathy, are an important predictor of the most serious crimes (i.e., sexual, violent) in adults. For example, in a meta-analysis of the relation between psychopathy and crime, Leistico et al. (2008) found that psychopathic traits were predictive of both violent and more general criminal recidivism in adult offenders. However, other researchers (e.g., Sohn et al., 2020) have reported that psychopathy only has utility in predicting violent criminal recidivism. Even so, it is apparent that personality traits, most notably

psychopathy, play a role in subsequent recidivism and especially violent crime among individuals with a criminal history.

Viewed together, these findings suggest that individuals in the criminal justice system are often at risk of recidivating due to their mental health and/or substance use problems. Furthermore, these individuals may also be at greater risk of criminal involvement due to specific personality characteristics. However, less is known about the contribution of these risk factors in relation to the broader social ecology of these individuals.

Family and Romantic Partner Characteristics

Researchers have established that difficult family relations are often linked with criminal recidivism. For example, offenders with higher levels of family conflict are at greater risk of being rearrested than are those offenders with more stable family relations (Boman & Mowen, 2019; Cottle et al., 2001). Conversely, social support from family members can have a buffering effect against criminal activity. In fact, several longitudinal studies have shown that continued, high quality family relations can act as a buffer against criminal recidivism in adults (Berg & Huebner, 2011; Visser & Travis, 2003). Furthermore, social support from family members can have a buffering effect on other risk factors, such as leveraging family ties to help former offenders overcome obstacles in obtaining employment (Berg & Huebner, 2011). Even so, investigators (e.g., Martinez, 2006) have noted that more research is needed to identify those elements of family support (e.g., emotional, financial) that represent the strongest buffers against recidivism. Moreover, it should be noted that much of the research examining the family relations of offenders has relied on single-item measures or archival data.

Researchers have yet to evaluate the effects of immediate family members' own antisocial behaviors on the criminal recidivism of adult offenders. However, research on the intergenerational transmission of crime has helped to shed light on the effects of parents' antisocial behavior on the criminality of their children (Craig et al., 2021; Farrington et al., 2009; Hjalmarsson & Lindquist, 2013). For example, Hjalmarsson and Linquist (2013) found that youths raised by a caregiver with a criminal history were more likely to be arrested for a crime themselves, regardless of whether the caregiver was a biological parent. These results suggest that environmental factors may play a greater role than do genetics in the onset of criminality. Even so, research is needed to investigate how relations between adult offenders and their criminally involved parents or other family members may affect offender recidivism.

Existing research regarding the romantic relationships of adults with a history of offending behavior indicates that these relationships can have both positive and negative effects on criminal involvement. Indeed, longitudinal research has suggested that being married or in a long-term romantic relationship is a protective factor against criminal recidivism for adults with a history of offending (Cobbina et al., 2012; Visher et al., 2009). On the other hand, researchers have also found that engagement in unstable, brief romantic relationships poses a risk factor for criminal recidivism (Visher et al., 2009). Thus, the quality of a romantic relationship may be more predictive of recidivism for adults in the criminal justice system than the simple presence or absence of a romantic relationship. However, this conclusion is tempered by the fact that research in this area has largely relied on indirect measures of relationship quality (e.g., using marital status to estimate relationship characteristics) rather than on more direct measures.

Research is also needed to directly examine whether being involved with a romantic partner with a criminal history contributes to future criminal activity in adult offenders. To date, however, there is some evidence that emerging adults who are involved in criminal behavior are more likely than adolescents with histories of crime to be involved with a romantic partner with a criminal history (van der Put et al., 2012). Nevertheless, it remains to be determined whether an offender's involvement with a partner who has criminogenic attitudes and/or behaviors leads to criminal activity.

Peer Characteristics

Extant research has demonstrated that involvement with acquaintances or friends who engage in antisocial or criminal behavior is a strong predictor of continued offending for adults with a criminal history (e.g., Visher & Travis, 2003; Warr & Stafford, 1993). Moreover, antisocial peer relations in adults have been linked with criminality across a wide variety of offenses (e.g., violence, substance use, piracy; Best et al., 2003; Higgins & Makin, 2004; Williamson & Silverman, 2001). On the other hand, the nature of these deviant peer relations (e.g., the specific criminal activities that peers are involved in) for adult offenders remains poorly understood due to the extensive use of single-item measures in the existing literature. Furthermore, the interactive effects of deviant peers and other systems (e.g., workplace, neighborhood) on recidivism in adult offenders remains unknown.

Given the linkage between involvement with deviant peers and higher rates of recidivism, perhaps it is not surprising that having relationships with prosocial peers has also been linked with lower rates of recidivism in adult offenders. In fact, research suggests that domestically violent offenders whose peers warn them about the continued

consequences of their violent behavior are less likely to engage in future violence toward women (Williamson & Silverman, 2001). Thus, it seems that prosocial peer relations can act as a protective factor against continued antisocial behavior among adults with a criminal history.

Workplace and Career Characteristics

Across numerous studies, unemployment has been linked with criminal recidivism for justice-involved adults (e.g., Siwach, 2018; Uggen, 2000). Conversely, employment is considered to be one of the strongest buffers against recidivism for adults on probation and parole. Indeed, research suggests that adults who are able to gain employment after being incarcerated are at reduced risk of reoffending (Laub & Sampson, 2003; Sampson & Laub, 1993). Furthermore, there is evidence that engaging in full-time work is second only to being married as a negative predictor of recidivism for adult offenders (Benda et al., 2005; Benda et al., 2003). Thus, obtaining full-time employment may be essential for avoiding recidivism among adults with a criminal history. Unfortunately, individuals who have been arrested and are currently on probation or parole often experience difficulties with obtaining employment (e.g., employers refusing to hire adults with a criminal history; Henderson, 2001; Watson et al., 2004). In fact, most adults who have been arrested for criminal activity are only employed for a small fraction of the time during the first year after their arrest and/or incarceration (Shinkfield & Graffam, 2009). Despite the abundance of research on the role of employment in helping former offenders to avoid recidivism, much of the existing literature has not examined whether specific aspects of offenders' work settings (e.g., support from supervisors or coworkers) are especially important to remain crime free.

Researchers have also suggested that adults with a criminal history have less access to the types of jobs that can further their careers (i.e., jobs that allow for career connections or references for better jobs; Tripodi et al., 2010). Moreover, there is evidence that offenders can benefit greatly from opportunities that remove barriers to employment. For example, vocational training programs that provide skills necessary for obtaining higher quality jobs can help to prevent recidivism in adult offenders (Harrison & Schehr, 2004). Viewed together, research findings indicate that employment barriers increase the likelihood of criminal recidivism among former offenders.

Neighborhood Characteristics

Researchers have determined that characteristics of the neighborhood in which an offender resides can also contribute to criminal recidivism. For example, longitudinal studies of individuals in the criminal justice system have found that living in a disadvantaged neighborhood (i.e., a high percentage of unemployed persons, low family incomes, poor access to social services) predicts further engagement in criminal activity (Hipp et al., 2010; Kubrin & Stewart, 2006). Furthermore, high mobility of neighborhood residents also predicts future involvement in criminal activity for former offenders (Wang et al., 2014). Conclusions from these studies should be tempered, however, given that much of this research has relied measures on publicly available records of neighborhood characteristics and has not assessed residents' perceptions of their neighborhoods.

Recent research also suggests that neighborhood context can play an indirect role in recidivism among individuals with criminal histories. For example, there is some evidence that living in a high-crime neighborhood provides former offenders with continued access to deviant peers, who represent another risk factor for criminal behavior

(Stahler et al., 2013). Similarly, studies with juvenile offenders have also reported that youths who live near at least one other peer with an offense history are more likely to recidivate (e.g., Mennis & Harris, 2011). Thus, it seems reasonable to suggest that certain neighborhoods may include a higher percentage of criminally involved peers and that involvement with these deviant peers may promote recidivism.

Multiple Systems

Only a handful of studies of offender recidivism have examined multiple social-ecological predictor variables simultaneously. One such study by Sampson and Laub (1990) indicated that adolescents with criminal histories who subsequently (a) obtained and held a job or attended college, (b) had a high level of commitment to education or work, (c) were married, and/or (d) had a strong attachment to a spouse had lower levels of criminal involvement during young adulthood. Similarly, a recent meta-analysis by Katsiyannis et al. (2017) found that a number of variables reflecting individual (i.e., younger age, antisocial personality traits, criminogenic values, high levels of personal distress, male gender, substance use) and family (i.e., family criminality, low parental warmth, ineffective parenting strategies) characteristics had small but significant effects (i.e., Cohen's d s = 0.20 and under) in predicting recidivism among adults with a criminal history. However, the authors cautioned that because the number of studies in their meta-analysis was small ($N = 19$), the addition of a few more studies could have rendered some effects nonsignificant. Moreover, it should be noted that few of the studies in this meta-analysis included measures of multiple and/or key domains (e.g., only one study examined family criminality) in the individual's social-ecological environment. Even so,

there is growing evidence that many variables across an individual's social ecology should be considered when developing a model of recidivism for adult offenders.

Present Study

In summary, the extant literature suggests that criminal recidivism in adult offenders is related to the broader social ecology in which these offenders reside. However, as noted earlier, the methodological limitations of the current literature (i.e., measures that are narrow in scope, have weak psychometric properties) make it difficult to draw conclusions about which variables are most strongly linked with reoffending. The purpose of the present study was to examine the relative contributions of different social-ecological risk factors to recidivism among individuals who were on probation or parole. To do so, I used a prospective research design: At Time One, I obtained measures of each person's criminal history, individual characteristics, family and romantic partner relations, peer relations, job and career characteristics, and neighborhood qualities; at Time Two (i.e., an average of six months later), I collected public court records that provided indices of criminal involvement since Time 1 (i.e., felonies and misdemeanors). My analytic strategy identified which Time One variables were the best predictors of criminal recidivism during the follow-up period (i.e., at Time Two).

The present study included several relative strengths. First, the prospective design allowed for the establishment of temporal precedence between social-ecological variables and criminal recidivism in adult offenders. Second, the reliability and validity of the measures that I chose represented a marked improvement over the measures used in prior research on recidivism in adult offenders. Finally, the use of self-report data rather than archival data at Time One allowed for a more precise examination of each individual's

social ecology (e.g., measuring intimate/marital relationship quality instead of intimate/marital relationship status).

The hypotheses for the present study are listed below. These hypotheses describe the relative contribution that each social-ecological factor was expected to have on recidivism (see Figure 1). Consistent with Bronfenbrenner's (1984) theory of social ecology, I expected that variables more distal to the individual (e.g., neighborhood and workplace characteristics) would have indirect effects on recidivism by affecting variables related to more immediate social systems (e.g., peer relations). Of note, although potential moderators were entered into each model (e.g., age, gender race), these moderators had not emerged as significant in prior research (Katsiyannis et al., 2017) and were not expected to emerge as significant in the present study.

1. The following variables were predicted to have direct effects on recidivism:
 - a. Mental health symptoms were expected to be positively related to involvement in misdemeanors, felonies, and any crime at follow-up.
 - b. Substance use was expected to be positively related to involvement in misdemeanors, felonies, and any crime at follow-up.
 - c. Psychopathic traits were expected to be positively related to involvement in misdemeanors, felonies, and any crime at follow-up.
 - d. Family and romantic partner social support were expected to be inversely related to involvement in misdemeanors, felonies, and any crime at follow-up.
 - e. Support from friends was expected to be inversely related to involvement in misdemeanors, felonies, and any crime at follow-up.

- f. Deviant family and romantic partner associations were expected to be positively related to involvement in misdemeanors, felonies, and any crime at follow-up.
 - g. Deviant peer associations were expected to be positively related to involvement in misdemeanors, felonies, and any crime at follow-up.
 - h. Employment barriers were expected to be positively related to involvement in misdemeanors, felonies, and any crime at follow-up.
2. The following variables were predicted to have indirect effects on recidivism:
- a. Workplace social support was expected to be inversely related to deviant peer associations, which, in turn, were expected to be positively related to involvement in misdemeanors, felonies, and any crime at follow-up.
 - b. Neighborhood safety and cohesion were expected to be inversely related to deviant peer associations, which, in turn, were expected to be positively related to involvement in misdemeanors, felonies, and any crime at follow-up.

CHAPTER 2: METHOD

Design

In the present study, measures tapping into multiple levels of the participants' social ecologies were collected at baseline (Time One) from adults who were serving either probation or parole in four states with publicly available court records (i.e., Indiana, Missouri, Oklahoma, Pennsylvania). Then, six months later (Time Two), criminal arrest data (i.e., misdemeanors and felonies) for each participant were collected through the respective state's internet court record database.

Participants

Participants included 101 individuals, 51 of whom were referred to the study through probation and parole offices and 50 of whom were referred through online advertisement methods (e.g., Craigslist). Individuals were informed that declining to participate in the study would not result in any sanctions from their probation/parole officer or the court. Inclusion criteria for the study required that each participant be (a) between the ages of 18 and 39 years, (b) serving probation or parole in a state with publicly available court records, and (c) able to converse in English. Individuals were paid \$15 as compensation for participating in the study. Of note, after the onset of the COVID-19 pandemic and related social distancing practices in March 2020, participants were only recruited online.

Participants in the present study endorsed the following racial and ethnic identities: White/Caucasian (69%), Black/African American (22%), Multiracial (8%), and Native American (1%). Regarding gender, the participants identified as male (62%), female (37%), or transgender (1%). The mean age of the sample was 31.49 years ($SD =$

5.61, range = 18.42 to 39.92). Furthermore, the participants had been adjudicated for an average of 2.61 ($SD = 2.79$) felonies and 2.70 misdemeanors ($SD = 3.33$) prior to the study; these individuals had been arrested for crimes ranging from substance use to violent crimes. Participants predominantly resided in Missouri (77%), and the remainder resided in Pennsylvania (14%), Oklahoma (7%), and Indiana (2%).

Procedures

Individuals serving on probation or parole were asked to (a) complete questionnaires pertaining to their personal adjustment and interpersonal relations and (b) have their public court records collected immediately following the initial assessment and again at later points in time. Each participant was informed that his or her involvement in the study was voluntary and that refusing to participate would not interfere with the receipt of court services (e.g., psychotherapy, vocational training). Each individual was also informed that his/her participation would contribute to the identification of mental health needs of offenders in general and to the continued development of treatment programs for them. The individuals who were recruited remained under the jurisdiction of the court regardless of their decisions about participating in the study. All of the participants in the study provided written consent for the above procedures.

Prior to the onset of the COVID-19 pandemic, participants completed written questionnaires in a physical location that was convenient to them (e.g., research laboratory, probation or parole office). Three advanced undergraduate research assistants conducted the assessments with the participants. Each assistant received approximately 20 hr of training prior to the first participant contact to standardize the assessment procedures and to recognize and attenuate circumstances (e.g., fatigue, reading problems)

that threatened the validity of the assessments. Participants were allowed to choose whether they would prefer to have the questionnaires read aloud to them or to complete the instruments themselves. After the onset of social distancing practices for COVID-19, all participants completed the questionnaires online through Qualtrics, although participants were offered the options of being guided through the measures via telephone or Zoom.

At Time Two, criminal court record searches were conducted by a different group of two advanced undergraduate research assistants who had also been trained for approximately 20 hr. All record searches took place in a private location (i.e., university laboratory). Several steps were taken to determine whether each participant still resided in a state with publicly available court records. First, state court records were searched and all arrests taking place after the initial assessment date (Time One) were documented. Second, for those individuals whose names did not appear in state court records, a search of state driver's license records was conducted; an individual was considered to reside in a given state if he/she still held a license in that state. Finally, property ownership and marriage licenses were also searched for individuals who had no court or driver's license record. The most recent date for which the individual was documented as residing in his/her state of origin (i.e., Indiana, Missouri, Oklahoma, or Pennsylvania) was recorded. Interrater reliability between the research assistants was tracked throughout the record search process, and regular weekly meetings were held to obtain consensus and address coding discrepancies. I assessed interrater reliability on 25% of the participants. There were no discrepancies between the results obtained by the research assistants ($k = 1.0$).

Measures

At Time One (i.e., baseline), self-report measures were used to tap into each participant's social ecology. At Time Two (approximately six months after the baseline measures were collected), criminal court records were collected to provide an index of criminal recidivism.

Time 1 Measures

Self-report measures were used to assess participants' individual characteristics, family and peer relations, workplace support, job characteristics, and neighborhood characteristics. Participants were also asked to complete a demographic form (see Appendix A). Reliability and validity data reported in this section pertain to noncriminal populations unless otherwise noted.

Mental health symptoms. The Brief Symptom Inventory (BSI; Derogatis, 1993; see Appendix) is a 53-item self-report measure that was used to assess mental health symptoms across nine subscales: Somatization, Obsessive Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism. Each item is rated from 0 (*not bothered in the previous week by the symptom*) to 4 (*extremely bothered by that symptom*). The Global Severity Index (GSI), which is the sum of scores on the individual items divided by the total number of items, was used to determine each respondent's overall level of symptomatology. The GSI is considered to be the best single index of respondent emotional distress (Derogatis, 1993); this index has high internal consistency (e.g., 0.64 to 0.87; for a review see Hayes, 1997) and excellent test retest reliability ($r_s = .68$ to $.91$ over a 6-month interval; for a review see Derogatis & Melisaratos, 1983). Furthermore, the GSI correlates moderately with

similar measures of mental health symptoms (e.g., the Minnesota Multiphasic Personality Inventory-2; Boulet & Boss, 1991; Preston & Harrison, 2003).

Alcohol use. The Alcohol Use Disorders Identification Test (AUDIT; Babor et al., 1992; see Appendix) is a 10-item self-report measure of alcohol problems. Scores range from 0 to 40, with a score of 8 or above indicating a potential alcohol problem. Reviewers have concluded that the internal consistency (median Cronbach's alpha across 18 reviewed studies = .80) and test-retest reliabilities ($r_s = .81$ to $.92$ over a 6-week period; Reinert & Allen, 2002) of the AUDIT are acceptable. Furthermore, the AUDIT is moderately correlated with other indexes of alcohol consumption, including self-report and biological measures (Allen et al. 2001).

Substance use. Substance use was assessed with the Drug Use Frequency (DUF; see Appendix) measure developed by O'Farrell et al. (2003). The DUF is a self-report tool that assesses substance use over the past six months for the following drugs: (a) sedatives, hypnotics, or tranquilizers; (b) cannabis; (c) stimulants; (d) heroin; (e) cocaine; (f) phencyclidine (i.e., PCP); and (g) hallucinogens. For each drug, specific examples are included (e.g., "marijuana" for "cannabis"). Participants responded on a scale from 0 (*never*) to 7 (*every day*). The DUF has demonstrated excellent test-retest reliability ($r = 0.80$) over a 12-month interval and correlates highly with collateral reports of drug use (O'Farrell et al., 2003).

Psychopathy. Psychopathic traits were assessed using the Psychopathy subscale of the Brief Dark Triad (Jones & Paulhus, 2014; Appendix). This subscale includes 9 items that represent core elements of psychopathy (e.g., callousness, impulsivity). The measure has adequate internal consistency reliability (Cronbach's alpha = .72) and is

highly correlated with longer instruments, such as the Self-Report Psychopathy measure ($r = .78$; Jones & Paulhus, 2014).

Family and peer support. The Multidimensional Perceived Support Scale (MPSS; Zimet et al., 1988; see Appendix) is a 12-item self-report measure that was used to assess support from family members (e.g., “I get the emotional help and support I need from my family”), romantic partners (e.g., “There is a romantic partner who is around when I am in need”), and friends (e.g., “I can talk about my problems with my friends”). Items are rated on a 1 (*very strongly disagree*) to 7 (*very strongly agree*) scale. Internal consistency (alphas) across the family, romantic partner, and peer scales ranges from .85 to .97, and test-retest reliability (r) at three months is .75 (Zimet et al., 1988). The MPSS is also moderately correlated with mental health symptoms, such as anxiety and depression (Zimet et al., 1988).

Deviant family and peer associations. To measure participants’ associations with family members or peers who were involved in criminal activities, I adapted a well-validated and widely used index of youth involvement with delinquent peers, the Pittsburgh Study Peer Delinquency Scale (PSPDS; Loeber et al., 1998; see Appendix). This 22-item self-report instrument measures respondent perceptions of (a) other persons’ disapproval of the respondent’s peers and (b) the peers’ involvement in illegal activities (e.g., substance use, theft, assault). The items were also adapted to assess family members’ (and a romantic partner’s) engagement in illegal activities. A score greater than zero for each item would be considered indicative of affiliation with criminally involved family members or peers; scores were summed for each type of relationship (i.e., family, romantic partner, peer). Participants who were not currently in a romantic relationship

were asked to report on their most recent romantic partner. Internal consistency (i.e., $\alpha = 0.84$ to 0.88) and test-retest reliabilities ($r = 0.62$) for the PSPDS are satisfactory (for a review, see Kimonis et al., 2004). Furthermore, the scales are moderately correlated with other facets of peer relations (e.g., engagement with conventional peers: Pardini et al., 2005).

Employment barriers. The Perceived Employment Barriers Scale (PEBS) was used to assess the number and types of employment barriers faced by each participant (Hong et al., 2014; see Appendix). This 20-item measure has demonstrated a 5-factor structure: (a) physical and mental health (e.g., “physical disabilities”), (b) labor market exclusion (e.g., “lack of work clothing”), (c) childcare (e.g., “needing to take care of young children”), (d) human capital (e.g., “having less than a high school education”), and (e) soft skills (e.g., “problem with getting to job on time”). Items are rated on a 0 (*not a barrier*) to 5 (*strong barrier*) scale. The PEBS is moderately correlated with other indices of employability, including hope for employment ($r = .40$; Hong et al., 2014).

Workplace support. The workplace social support (WSS) scale was adapted for the present study from an instrument that originally was used to measure support for nurses from supervisors and peers at work (Anderson & Williams, 1996; Bacharach et al., 2010; see Appendix). This 10-item self-report instrument includes items such as “talked through problems at work” and “given you positive feedback about your work.” Items are rated on a 0 (*never*) to 4 (*several times a day*) scale. Participants were first asked to rate their coworkers (collectively) on each item and then to rate their supervisor (collectively, if more than one supervisor) on the items. Participants who were not currently employed were asked to rate coworkers and supervisors in the job setting at which they most

recently worked. Items on the WSS load onto a single factor and have excellent internal consistency ($\alpha = 0.90$; Anderson & Williams, 1996). Furthermore, the WSS is moderately correlated with other elements of workplace wellbeing (e.g., seeking help; Anderson & Williams, 1996).

Neighborhood characteristics. The 15-item Neighborhood Qualities Measure (NQM; Mujahid et al., 2007; see Appendix) was used to assess two aspects of neighborhoods: safety (e.g., “My neighborhood is safe from crime”) and social cohesion (e.g., “People around here are willing to help their neighbors”). The items are rated on a 1 (*strongly agree*) to 5 (*strongly disagree*) scale. The NQM has demonstrated high internal consistency (alphas range from 0.77 to 0.94) and test-retest reliabilities ($r_s = 0.78$ to 0.91; Mujahid et al., 2007).

Time Two Measures

Participant involvement in misdemeanor and felony arrests since Time One was recorded by research assistants at Time Two. Because none of the participants in the present study had any of their arrests since Time One fully adjudicated at Time Two, only non-adjudicated arrests were documented at Time Two. The absence of any fully adjudicated arrests during the 6-month follow-up period was not surprising given that six months is typically an insufficient amount of time for the adjudication process to be concluded. After the numbers of felonies and misdemeanors were recorded for each participant, a sum score was also created to measure each participant’s involvement in any type of crime at Time Two. Ultimately, three binary variables were created to evaluate Time Two criminal recidivism: involvement in any misdemeanor, any felony, or any crime.

CHAPTER 3: RESULTS

Preliminary Analyses

Several steps were taken to ensure the integrity of the data. First, kurtosis and skewness (e.g., low item endorsement) in the data from each measure were assessed. Although less than 1% of items exhibited kurtosis or skewness, data from items with either of these traits were not included in further analyses. Second, patterns of missing data (i.e., missing at random [MAR] vs. missing not at random) were evaluated by performing the Missing Completely at Random Test (Little, 1988) using the *mice* package in R. Of note, less than 5% of data were missing at the item-level at Time One. Thus, consistent with best practices (Sterne et al., 2009), data that were considered MAR were replaced using multiple imputation.

Tables 1 contains means, standard deviations, and internal consistencies for Time One variables. Internal consistencies ranged from acceptable (.79) to excellent (.97). In addition, prior to running full models predicting the effect of Time One variables on criminal recidivism, discrete logistic regression models were run to describe the unique effect of each Time One variable on involvement in criminal activity at Time Two (see Table 2). Notably, neighborhood safety predicted lower levels of involvement in misdemeanors, felonies, and any crime at Time Two; in addition, higher levels of family support and lower levels of deviant family associations were uniquely linked with involvement in misdemeanors at Time Two.

In the present study, 13% of participants were rearrested at the time of follow-up, with 10% rearrested for misdemeanor crimes and 7% rearrested for felony crimes. None of the participants with at least one rearrest had yet been adjudicated for their crime(s);

thus, sentencing data were not available for these participants. It should be noted that the rate of recidivism did not vary by whether participants completed the baseline assessment prior to or after the onset of the COVID-19 pandemic, as evidenced by a chi-square test.

Primary Analyses

To determine the effects of Time One variables (i.e., individual, family, peer, employment, and neighborhood characteristics) on criminal outcomes at Time Two (i.e., involvement in misdemeanors, felonies, and any crime), backwards stepwise logistic regressions were employed (McCullagh & Nadler, 2018). Backwards stepwise logistic regressions are appropriate for data that have binary outcomes (e.g., arrested vs. not arrested) and are censored (i.e., data with a large proportion of zeroes). Furthermore, this approach to regression begins with a fully saturated model that contains all predictor variables and subsequently reduces the number of variables until a model that best fits the data remains.

Backward logistic stepwise regressions yield estimates called odds ratios (ORs) that were used in the present study to interpret the effect of each predictor variable on rearrests. An OR greater than 1.0 would denote that an increase in the value of a predictor had led to an increase in the odds of an outcome, whereas an OR less than 1.0 would indicate that an increase in the value of a predictor had led to decreased odds of an outcome. Thus, in the present study, a value of less than 1.0 would indicate that a higher score on a Time One variable was linked with reduced odds of rearrest for a misdemeanor, felony, or any crime. Moreover, with backwards logistic regressions, it would also be expected that many of the ORs in the initial, full model would be nonsignificant but could emerge as significant in the final, simplified model. Post-hoc

analyses were also conducted to evaluate whether race, gender, or age served as moderators of significant effects.

To determine the indirect effects of Time One (baseline) variables on criminal outcomes at Time Two, mediation was used. More specifically, the PROCESS macro in SPSS (Hayes, 2017) was used to assess the indirect influence of neighborhood-level and workplace-level Time One variables on Time Two variables. Hayes and Rockwood (2017) have established that the PROCESS macro is appropriate for detecting indirect effects through mediation, even when the independent variable does not have a direct effect on the dependent variable (i.e., workplace or neighborhood characteristics may not necessarily have a direct effect on criminal activity). Thus, I used the PROCESS macro to evaluate the indirect pathways between Time One and Time Two variables.

Misdemeanors

Table 3 lists the results for the full and final models for participants' involvement in misdemeanors. The initial full model predicting involvement in misdemeanors at Time Two was not statistically significant and did not contain any significant predictors. In contrast, the final model predicting the odds of being rearrested for a misdemeanor was significant ($X^2 = 13.73; p < .01$) and retained three variables: family support, peer support, and neighborhood safety (see Table 5). Of these predictors, neighborhood safety ($OR = 0.27; p < .05$) and family support ($OR = 0.23; p < .01$) were significant, such that higher levels of family support and neighborhood safety at Time One were related to lower odds of involvement in misdemeanors at Time Two. Age, race, and gender did not emerge as moderators or relations between variables in the final model ($ps = .33 - .89$).

Felonies

As shown in Table 4, the full model containing all predictors for involvement in felonies was nonsignificant, with no variables emerging as significant predictors. However, the final model for felonies was significant ($X^2 = 6.67; p < .05$) and retained two predictors: deviant peer associations and neighborhood safety. One of the variables, neighborhood safety, was a marginally significant predictor of recidivism, with higher levels of neighborhood safety predicting reduced odds of involvement in felonies ($OR = 0.36; p < .10$). Although deviant peer associations were retained in the final model, this variable was not a significant predictor of recidivism ($p = .23$). Of note, age, race, and gender did not moderate the results ($ps = .42 - .67$).

Any crime

In the full model for involvement in any crime, no variables initially emerged as significant predictors of criminal activity (see Table 5). Subsequently, the final model was significant ($X^2 = 4.98; p < .05$) and retained one predictor, neighborhood safety; higher levels of neighborhood safety at Time One were linked with reduced odds of being involved in any crime at Time Two ($OR = 0.45; p < .05$). As before, race, age, and gender did not emerge as significant moderators in the final model ($ps = .37 - .78$).

Mediators

Table 6 provides an overview of the results regarding deviant peer associations as a potential mediator of the relation of workplace and neighborhood variables to criminal recidivism. To be statistically significant, the indirect effect of peer relations on a given recidivism variable could not have a zero in the 95% confidence interval. The results showed that deviant peer involvement at Time One did not mediate the relations of (a)

workplace peer support, (b) workplace supervisor support, (c) neighborhood safety, or (d) neighborhood cohesion to involvement in misdemeanors, felonies, or any crime at Time Two.

CHAPTER 4: DISCUSSION

Adult offenders are at considerable risk of criminal recidivism and long-term involvement in the justice system, with 50% of individuals on probation or parole being rearrested within a year (Kaeble et al., 2018). This level of criminal recidivism is extremely concerning owing to a wide range of adverse consequences for victims, taxpayers, and the offenders themselves. These negative consequences and an absence of effective treatments for adult offenders point to an urgent need for research that identifies the key risk factors for recidivism in justice-involved adults. Unfortunately, prior research examining predictors of recidivism among justice-involved individuals has evidenced several fundamental methodological flaws (e.g., use of measures with weak psychometric properties). The present study sought to improve upon this prior literature by examining the relation of a broad range of individual and social-ecological risk factors to criminal recidivism in justice-involved individuals. More specifically, I evaluated which individual, family, peer, workplace, and neighborhood variables predicted criminal recidivism six months after an initial assessment of those variables for adults on probation and parole. The results showed that neighborhood safety played a key role in reducing the odds of participants' involvement in misdemeanors, felonies, or any crime at Time Two. Furthermore, family support was also linked with participants' reduced involvement in misdemeanors. Of note, individual-level variables did not predict the odds of participants' recidivism at Time Two.

Neighborhood safety, as perceived by participants, was the most consistent predictor of criminal recidivism. The finding of a direct effect of neighborhood safety on recidivism was unexpected given that neighborhood characteristics are most often

thought to have a distal influence on behavior (see Bronfenbrenner, 1994). Even so, there is some evidence that neighborhood safety can play an important role in shaping the lives of justice-involved adults. Indeed, Stahler et al. (2013) found that neighborhood dangerousness (i.e., a high proportion of criminally-involved individuals) had a direct effect on recidivism among individuals on probation and parole, even after controlling for individual-level variables (e.g., substance abuse). There is also evidence that interventions that reduce the number of parolees in a neighborhood can lead to lower rates of reincarceration among remaining residents (Kirk, 2015). Thus, it seems reasonable to suggest that participants in the present study may have perceived their neighborhoods as being less safe due to a high proportion of criminally-involved peers. On the other hand, participants living in neighborhoods with higher crime rates may also have been more likely to engage in certain illegal behaviors or probation/parole violations to feel safer (e.g., carrying a gun for protection, using substances to feel calmer). Indeed, researchers have consistently found that individuals living in neighborhoods with high rates of gang-related and community violence are more likely to be arrested for a firearm charge (Barragan et al., 2016; Huebner et al., 2016). Viewed together, it would seem that there are several possible avenues (i.e., deviant peer relations, self-protective but illegal behaviors) through which low neighborhood safety may confer greater risk of rearrest for individuals on probation and parole.

Participants' perceptions of family support (i.e., assistance in handling problems and emotional difficulties) were also linked with reduced involvement in misdemeanors. This finding is consistent with prior research demonstrating that emotional support from family members is an important protective factor against recidivism for criminally

involved individuals (Berg & Huebner, 2011; Bonta & Andrews, 2007) and that increases in family cohesion are related to decreased rates of arrests for adults with criminal histories (Johnides et al., 2017). Of course, it seems likely that other types of family support not assessed in the present study could also help to prevent involvement in further criminal activity. In fact, there is evidence that individuals on probation and parole who rely on family members for help with gaining employment are less likely to recidivate (Uggen et al., 2008). Furthermore, incarcerated individuals whose family members visit them during their incarceration are more likely to avoid reincarceration following their release from prison (Folk et al., 2019). In future work, I plan to assess different types of family support (e.g., tangible support, visitation during incarceration, help with employment) to better understand the role that social support plays in buffering against criminal recidivism.

Although the present study identified some direct pathways between the social environment and criminal recidivism among adults on probation and parole, the findings did not point to any indirect pathways between these variables. More specifically, the findings did not support the hypothesis that deviant peer associations would mediate the relation of neighborhood safety or workplace support to criminal recidivism. It may be that the measure of deviant peer relations used in the present study was too narrow, inasmuch as participants were asked to only think of peers with whom they had consistent contact (i.e., not casual acquaintances). Indeed, prior research has established that justice-involved individuals often commit crimes either by themselves or with individuals with whom they do not have strong social ties (Stolzenberg & D'Alessio, 2008; van Mastrigt & Farrington, 2009). In future work, I plan to investigate the adult

offender's broader social circle (e.g., acquaintances vs. friends) to better understand how different amounts and types of deviant peer relations might be linked with criminal activity.

Also contrary to my hypotheses, individual-level variables (i.e., mental health problems, alcohol use, substance use, psychopathy) did not predict recidivism among the participants. Even so, these variables may still be important to consider when examining risk and resilience for individuals on probation and parole. In fact, it would be unreasonable to suggest that mental health difficulties and substance use or abuse are unimportant influences for individuals on probation when the prevalence rates for these types of problems among justice-involved individuals are so high and have been previously linked with recidivism (Draine et al., 2011; Sadeh & McNeil, 2010). Nevertheless, it should be noted that prior work in this area did not measure mental health and substance use problems conjointly with social-environmental factors. Thus, it remains possible that neighborhood and family variables play a larger role in recidivism for adult offenders than do these individual-level variables per se. It is also possible that neighborhood safety and family support serve to reduce mental health symptoms and substance use in adult offenders. Indeed, recent research has established that strong family ties can help to reduce mental health symptoms for individuals on probation and parole (Malcome et al., 2019; Winham et al., 2015).

In sum, although I predicted that a broad range of social-ecological variables would be linked with criminal recidivism, only neighborhood safety and family support emerged as significant predictors.. Given that there is great variability in justice-involved individuals' social ecologies (Katsiyannis et al., 2017), it is possible that certain variables

play a greater role in recidivism for some individuals than for others. For example, extant research suggests that various subgroups of offenders can be differentiated on the basis of their personality traits (e.g., psychopathy; Dargis & Koenigs, 2018) and offending patterns (e.g., violent vs. nonviolent; Cardwell & Piquero, 2018). Thus, it could be the case that these subgroups differ in their social environments which, in turn, might be linked with unique pathways to recidivism. Such pathways are well established in the literature on youth antisocial and criminal behavior. In fact, researchers have found that youths with more serious and chronic patterns of offending (i.e., life-course-persistent offenders) have more severe social-environmental deficits than do youths with less serious and more time-limited patterns (Moffitt, 2018; Ronis & Borduin, 2013). However, more work is needed to identify possible trajectories of offending in adults (i.e., throughout the lifespan) as well as variables that are linked with recidivism in different trajectories.

There are several limitations to the present study that warrant comment. First, much of the data were collected during an unprecedented global pandemic. As such, the pandemic may have biased the data, especially those data pertaining to felony arrests. Indeed, a recent study indicated that the rate of serious and violent crimes (but not less serious crimes) in the United States during the first half of 2020 was significantly lower than in prior years (Boman & Gallupe, 2020). On the other hand, despite the reduced recidivism rates in the present study, it is notable that family support and neighborhood cohesion still emerged as significant predictors of recidivism. Second, this study relied solely on self-reports from a single informant in each individual's social ecology (i.e., the participant). Given the importance of family relations for justice-involved individuals, it

would be ideal to include reports from other family members and persons outside of the individual's family (e.g., peers, probation officers) in future studies. Direct observations of family and peer relations might also yield different results than those in the present study (see e.g., De Los Reyes et al., 2019; Henggeler et al., 1987). Third, the present study followed participants' criminal involvement for a relatively brief period of time (i.e., an average of six months following baseline). In the future, I plan to conduct a longer follow-up (i.e., one year or more) to obtain a more reliable measure of criminality during adulthood. Fourth, the sample may not be representative of the larger population of justice-involved adults in the United States, given that participants came from only four states and were less racially and ethnically diverse than the demographic makeup of the adult offender population in the United States (Bureau of Justice Statistics, 2018). Lastly, the present study evaluated individual and social-ecological characteristics of the participants at a single point in time. Future work should use more innovative methods (e.g., ecological momentary assessment) to evaluate how changes in social-ecological variables over time are linked with criminal recidivism in adults on probation and parole.

Although the present study has limitations, it also has tentative implications for the development of effective interventions with adults on probation and parole. In fact, most interventions available to adults on probation and parole focus on the amelioration of mental health or substance use problems and fail to address the contexts in which those problems develop and are maintained (Epperson et al., 2014). However, the results of the present study suggest that a broad-based treatment model with interventions that target neighborhood safety and family support might be effective in reducing recidivism in adults. For example, an intervention that helps an individual on probation or parole to

identify and move to a safer neighborhood might prevent further criminal involvement for that person. Furthermore, other interventions could seek to increase support between the individual and his or her family members. Currently, two evidence-based treatments for youth antisocial behavior that have relied heavily on family and neighborhood-based interventions (i.e., Multisystemic Therapy [Henggeler et al., 2009], Functional Family Therapy [Sexton & Alexander, 2004]) are in the early stages of being adapted for adult offenders. Pilot trials of each treatment with justice-involved adults have demonstrated that these adaptations show considerable promise in the reduction of risk for recidivism (Datchi & Sexton, 2013; Davis, et al., 2015).

In conclusion, the present study evaluated the relation of a wide range of individual, family, peer, workplace, and neighborhood variables to criminal recidivism in individuals on probation and parole. The findings suggest that lower levels of neighborhood safety and family support may be key contributors to criminal recidivism for offenders. Although continued research that includes multiple measurement methods and a longer follow-up period is needed, the social-ecological perspective used in the current study may help to guide future theoretical work and intervention development for justice-involved adults.

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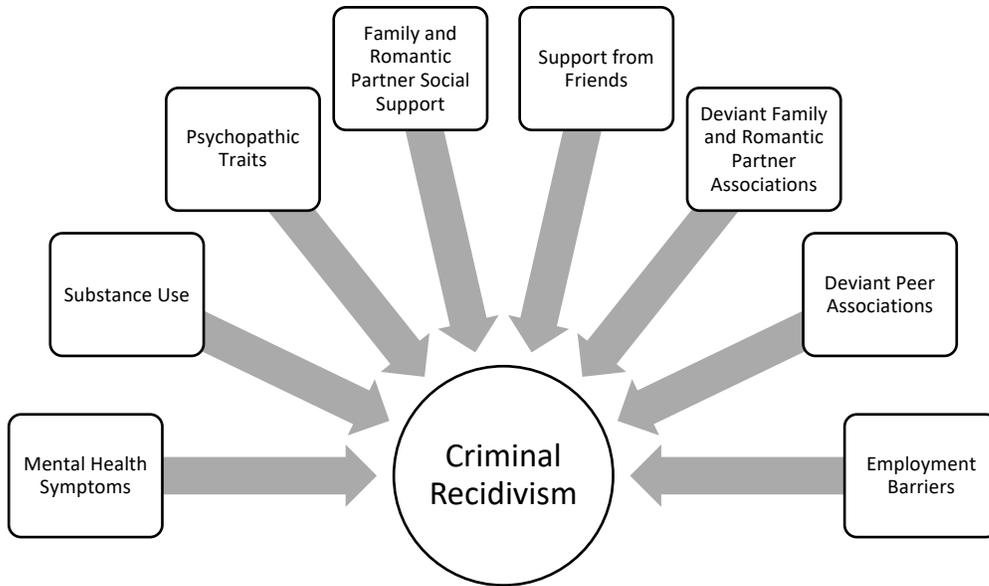


Figure 1. Social-ecological factors hypothesized to predict recidivism in adults on probation and parole.

Table 1

Means, Standard Deviations, and Alphas for Social-Ecological Predictors at Time One

Variable	Mean	SD	Cronbach's alpha
Mental Health Symptoms	1.21	0.77	.97
Alcohol Use	2.95	4.44	.83
Substance Use	5.47	6.07	.89
Psychopathy	2.47	0.70	.79
Family Support	4.46	1.94	.94
Romantic Partner Support	4.37	2.02	.96
Friend Support	4.25	1.67	.91
Deviant Family Associations	4.10	7.46	.94
Deviant Peer Associations	7.54	8.60	.88
Employment Barriers	43.70	19.24	.94
Workplace Supervisor Support	1.50	1.02	.94
Workplace Peer Support	1.57	0.90	.90
Neighborhood Safety	2.73	1.33	.91
Neighborhood Cohesion	2.78	1.03	.87

Note. *SD* = standard deviation.

Table 2

Pairwise Odds Ratios for Unique Predictors of Criminal Involvement

Variable	Misdemeanors	Felonies	Any Crime
Mental Health Symptoms	1.32	0.49	1.04
Alcohol Use	1.01	0.50	0.83
Substance Use	1.44	1.10	1.28
Psychopathy	1.27	0.68	0.94
Family Support	0.47*	1.55	0.72
Romantic Partner Support	0.85	0.89	0.80
Friend Support	1.05	1.49	1.09
Deviant Family Associations	1.72*	0.12	1.42
Deviant Peer Associations	1.54	0.29	1.20
Employment Barriers	0.90	0.81	0.90
Workplace Supervisor Support	0.76	1.28	0.99
Workplace Peer Support	0.66	1.29	0.89
Neighborhood Safety	0.37*	0.30*	0.37*
Neighborhood Cohesion	0.57	0.63	0.57

Note. Each odds ratio is the product of a single, discrete model.

* $p < .05$

Table 3

Social-Ecological Predictors of the Odds of Involvement in Misdemeanors

Variable	OR	95% CI	
Full Model			
Menta Health Symptoms	1.67	0.38	7.31
Alcohol Use	0.89	0.30	2.64
Substance Use	1.63	0.61	4.33
Psychopathy	1.21	0.31	4.73
Family Support	0.33	0.09	1.24
Romantic Partner Support	1.03	0.43	2.51
Friend Support	3.71	0.85	16.2
Deviant Family Associations	1.56	0.51	4.79
Deviant Friend Associations	1.02	0.30	3.46
Employment Barriers	0.77	0.19	3.07
Workplace Supervisor Support	0.98	0.17	5.54
Workplace Peer Support	0.62	0.11	3.66
Neighborhood Safety	0.19	0.04	1.07
Neighborhood Cohesion	1.05	0.22	5.03
Final Model			
Family Support	0.23**	0.08	0.69
Friend Support	2.43	0.80	7.37
Neighborhood Safety	0.27*	0.09	0.87

Note. OR = odds ratio. CI = confidence interval. * $p < 0.05$; ** $p < 0.01$

Table 4

Social-Ecological Predictors of the Odds of Involvement in Felonies

Variable	OR	95% CI	
Full Model			
Menta Health Symptoms	0.79	0.13	4.87
Alcohol Use	1.11	0.22	5.62
Substance Use	1.87	0.59	5.93
Psychopathy	1.08	0.22	5.44
Family Support	1.21	0.25	5.87
Romantic Partner Support	0.61	0.20	1.88
Friend Support	1.67	0.42	6.68
Deviant Family Associations	0.16	0.00	4.56
Deviant Peer Associations	0.10	0.00	5.40
Employment Barriers	0.72	0.24	2.21
Workplace Supervisor Support	1.15	0.28	4.74
Workplace Peer Support	1.18	0.26	5.45
Neighborhood Safety	0.21	0.03	1.47
Neighborhood Cohesion	1.91	0.39	9.44
Final Model			
Deviant Peer Associations	0.20	0.01	2.78
Neighborhood Safety	0.36*	0.11	1.17

Note. OR = odds ratio. CI = confidence interval.

* $p < 0.10$

Table 5

Social-Ecological Predictors of the Odds of Involvement in Any Crime

Variable	OR	95% CI	
Full Model			
Menta Health Symptoms	1.34	0.44	4.04
Alcohol Use	0.79	0.31	1.98
Substance Use	1.47	0.71	3.05
Psychopathy	0.84	0.32	2.17
Family Support	0.54	0.21	1.38
Romantic Partner Support	0.90	0.44	1.84
Friend Support	2.07	0.73	5.87
Deviant Family Relations	1.43	0.63	3.26
Deviant Peer Relations	0.92	0.36	2.31
Employment Barriers	0.78	0.33	1.86
Workplace Supervisor Support	1.23	0.37	4.13
Workplace Peer Support	0.80	0.23	2.72
Neighborhood Safety	0.37	0.11	1.28
Neighborhood Cohesion	0.99	0.30	3.32
Final Model			
Neighborhood Safety	0.45*	0.21	0.97

Note. OR = odds ratio. CI = confidence interval.

* $p < 0.05$

Table 6

*Deviant Peer Associations as a Mediator of the Relation of Neighborhood and Workplace**Variables to Criminal Recidivism*

Variable	Any crime		Felonies		Misdemeanors	
	β	95% CI	β	95% CI	β	95% CI
Workplace Peer Support	0.01	[-0.12, 0.05]	-0.01	[-0.86, 0.64]	0.01	[-0.14, 0.09]
Workplace Supervisor Support	0.02	[-0.13, 0.12]	-0.21	[-2.18, 0.32]	0.05	[-0.11, 0.21]
Neighborhood Safety	0.01	[-0.04, 0.10]	-0.02	[-0.69, 0.58]	0.01	[-0.08, 0.20]
Neighborhood Cohesion	-0.01	[-0.07, 0.08]	0.06	[-0.36, 0.99]	-0.01	[-0.10, 0.09]

Note. Betas represent the indirect relationship between workplace and neighborhood variables, deviant peer associations, and criminal involvement. All values have a zero in the confidence interval and are nonsignificant.

APPENDIX: MEASURES

Demographic Form

Name: _____ Nickname (s): _____ Date of Birth: _____
Address: _____ Phone: _____
Email: _____
Gender: _____ Race: _____ Ethnicity: _____
Highest level of Education: _____ High School
GPA: _____
How many children do you have? _____
Current relationship status (circle one): Single Serious relationship and not living
together Serious relationship and living together Married Separated
Divorced
Length of current relationship: _____
Job status (circle one): Unemployed Part-time Full-time
Job description (if not currently employed, describe most recent job):

Annual Income: _____ Hourly income: _____ Hours worked per week:

Please list any medical problems that you may have (e.g., diabetes, asthma):

Please list any medications that you are currently taking:

Please list any prior mental health diagnoses that have been given to you by a mental
health
professional: _____

Mental Health Symptoms

Below is a list of problems and complaints that people sometimes have. Please read each one carefully. After you have done so, circle the number that best describes how much discomfort that problem has caused you during the past week including today.

- 0 = Not at all
- 1 = A little bit
- 2 = Moderately
- 3 = Quite a bit
- 4 = Extremely

Example:

How much were you distressed by:

1. Bodyaches.....0 1 2 3 4

IN THE LAST WEEK, HOW MUCH WERE YOU DISTRESSED BY:

1. Nervousness or shakiness inside.....0 1 2 3 4
2. Faintness or dizziness.....0 1 2 3 4
3. The idea that someone else can control your thoughts.....0 1 2 3 4
4. Feeling others are to blame for most of your trouble.....0 1 2 3 4
5. Trouble remembering things.....0 1 2 3 4
6. Feeling easily annoyed or irritated.....0 1 2 3 4
7. Pains in heart or chest.....0 1 2 3 4
8. Feeling afraid in open space.....0 1 2 3 4
9. Thoughts of ending your life.....0 1 2 3 4
10. Feeling that most people cannot be trusted.....0 1 2 3 4
11. Poor appetite.....0 1 2 3 4
12. Suddenly scared for no reason.....0 1 2 3 4
13. Temper out bursts that you could not control.....0 1 2 3 4

0 = Not at all
1 = A little bit
2 = Moderately
3 = Quite a bit
4 = Extremely

- 14. Feeling lonely even when you are with people.....0 1 2 3 4
- 15. Feeling blocked in getting things done.....0 1 2 3 4
- 16. Feeling lonely.....0 1 2 3 4
- 17. Feeling blue.....0 1 2 3 4
- 18. Feeling no interest in things.....0 1 2 3 4
- 19. Feeling fearful.....0 1 2 3 4
- 20. Your feelings being easily hurt.....0 1 2 3 4
- 21. Feeling that people are unfriendly or dislike you.....0 1 2 3 4
- 22. Feeling inferior to others.....0 1 2 3 4
- 23. Nausea or upset stomach.....0 1 2 3 4
- 24. Feeling that you are watched or talked about by others.....0 1 2 3 4
- 25. Trouble falling asleep.....0 1 2 3 4
- 26. Having to check and double check what you do.....0 1 2 3 4
- 27. Difficulty making decisions.....0 1 2 3 4
- 28. Feeling afraid to travel on buses, subways, or trains.....0 1 2 3 4
- 29. Trouble getting your breath.....0 1 2 3 4
- 30. Hot or cold spells.....0 1 2 3 4
- 31. Having to avoid certain things, places, or activities.....0 1 2 3 4
- 32. Your mind going blank.....0 1 2 3 4
- 33. Numbness or tingling in parts of your body.....0 1 2 3 4

0 = Not at all
1 = A little bit
2 = Moderately
3 = Quite a bit
4 = Extremely

- 34. The idea that you should be punished for your sins.....0 1 2 3 4
- 35. Feeling hopeless about the future.....0 1 2 3 4
- 36. Trouble concentrating.....0 1 2 3 4
- 37. Feeling weak in parts of your body.....0 1 2 3 4
- 38. Feeling tense keyed up.....0 1 2 3 4
- 39. Thoughts of death or dying.....0 1 2 3 4
- 40. Having urges to beat, injure, or harm someone.....0 1 2 3 4
- 41. Having urges to break or smash things.....0 1 2 3 4
- 42. Feeling very self-conscious with others.....0 1 2 3 4
- 43. Feeling uneasy in crowds.....0 1 2 3 4
- 44. Never feeling close to another person.....0 1 2 3 4
- 45. Spells of terror or panic.....0 1 2 3 4
- 46. Getting into frequent arguments.....0 1 2 3 4
- 47. Feeling nervous when you are left alone.....0 1 2 3 4
- 48. Others not giving you proper credit for your achievements.....0 1 2 3 4
- 49. Feeling so restless you couldn't sit still.....0 1 2 3 4
- 50. Feelings of worthlessness.....0 1 2 3 4
- 51. Feeling that people will take advantage of you if you let them.....0 1 2 3 4
- 52. Feelings of guilt.....0 1 2 3 4
- 53. The idea that something is wrong with your mind.....0 1 2 3 4

Alcohol Use

Please circle the answer that is correct for you

1. How often do you have a drink containing alcohol?

- Never
- Monthly or less
- 2-4 times a month
- 2-3 times a week
- 4 or more times a week

2. How many standard drinks containing alcohol do you have on a typical day when drinking?

- 1 or 2
- 3 or 4
- 5 or 6
- 7 to 9
- 10 or more

3. How often do you have six or more drinks on one occasion?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

4. During the past year, how often have you found that you were not able to stop drinking once you had started?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

5. During the past year, how often have you failed to do what was normally expected of you because of drinking?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

6. During the past year, how often have you needed a drink in the morning to get yourself going after a heavy drinking session?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

7. During the past year, how often have you had a feeling of guilt or remorse after drinking?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

8. During the past year, have you been unable to remember what happened the night before because you had been drinking?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

9. Have you or someone else been injured as a result of your drinking?

- No
- Yes, but not in the past year
- Yes, during the past year

10. Has a relative or friend, doctor or other health worker been concerned about your drinking or suggested you cut down?

- No
- Yes, but not in the past year
- Yes, during the past year

Substance Use Frequency

Please describe the frequency of your drug use over the past six months.

0	1	2	3	4	5	6	7
Never	Several times	About once a month	Several times a month	1-2 days a week	3-4 days a week	5-6 days a week	Everyday

- _____ 1. Sedatives, hypnotics or tranquilizers
- _____ 2. Cannabis
- _____ 3. Stimulants
- _____ 4. Heroin
- _____ 5. Cocaine
- _____ 6. Phencyclidine (PCP)
- _____ 7. Hallucinogens

Psychopathic Traits

Please rate your agreement or disagreement with each item using the following guidelines.

1	2	3	4	5
Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

- _____ 1. I like to get revenge on authorities.
- _____ 2. I avoid dangerous situations.
- _____ 3. Payback needs to be quick and nasty.
- _____ 4. People often say I'm out of control.
- _____ 5. It's true that I can be mean to others.
- _____ 6. People who mess with me always regret it.
- _____ 7. I have never gotten into trouble with the law.
- _____ 8. I enjoy having sex with people I hardly know.
- _____ 9. I'll say anything to get what I want.

Family, Peer, and Romantic Relationship Support

Instructions: We are interested in how you feel about the following statements. Reach each statement carefully. Indicate how you feel about each statement.

Circle “1” if you **Very Strongly Disagree**

Circle “2” if you **Strongly Disagree**

Circle “3” if you **Mildly Disagree**

Circle “4” if you are **Neutral**

Circle “5” if you **Mildly Agree**

Circle “6” if you **Strongly Agree**

Circle “7” if you **Very Strongly Agree**

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

Characteristics of Friends, Family Members, and Romantic Partner

The following questions pertain to how other people view your friends, family members, and romantic partner and the activities that they are involved in.

1. How many friends do you have? _____
2. How many of those friends are close or special friends? _____
3. How many times a week do you hang out with your friends? _____
4. Are there any of your friends that other people disapprove of? _____
5. How many of your friends do other people disapprove of? _____
6. Has anyone ever said that any of your friends are a bad influence on you?

7. How many of your friends do other people think are a bad influence on you?

8. Do you still hang around with your friends even though other people think they are a bad influence on you? _____

During the past 90 days, how many of your friends have:

1. Lied or been rude to other people: ____
2. Purposely damaged or destroyed property that did not belong to them: ____
3. Stolen something less than \$5: ____
4. Stolen something worth more than \$5 but less than \$100? ____
5. Stolen something worth more than \$100? ____
6. Gone into or tried to go into a building to steal something? ____
7. Gone joyriding, that is, taking a motor vehicle such as a car or motorcycle for a ride or drive without the owner's permission? ____
8. Hit someone with the idea of hurting that person? ____
9. Attacked someone with a weapon or with the idea of seriously hurting that person? ____
10. Used a weapon, force of strong-arm methods to get money or things from people?

11. Sold hard drugs such as heroin, cocaine, or LSD? _____

12. Used too much alcohol? ____
13. Used marijuana or hashish? ____
14. Used hard drugs such as heroin, cocaine, or LSD? ____

Please answer the following questions about your family members (e.g., mother or mother figure, father or father figure, siblings, aunts and uncles, and cousins).

1. How many family members do you have contact with? ____
2. How many of those family members are you close with? ____
3. How many times a week do you hang out with your family members? ____
4. Are there any of your family members that other people disapprove of? ____
5. How many of your family members do other people disapprove of? ____
6. Has anyone ever said that any of your family members are a bad influence on you? ____
7. How many of your family members do other people think are a bad influence on you? ____
8. Do you still hang around with your family members even though other people think they are a bad influence on you? ____

During the past 90 days how many of your family members have:

1. Lied or been rude to other people: ____
2. Purposely damaged or destroyed property that did not belong to them: ____
3. Stolen something less than \$5: ____
4. Stolen something worth more than \$5 but less than \$100? ____
5. Stolen something worth more than \$100? ____
6. Gone into or tried to go into a building to steal something? ____
7. Gone joyriding, that is, taking a motor vehicle such as a car or motorcycle for a ride or drive without the owner's permission? ____
8. Hit someone with the idea of hurting that person? ____
9. Attacked someone with a weapon or with the idea of seriously hurting that person? ____

10. Used a weapon, force of strong-arm methods to get money of things from people?

11. Sold hard drugs such as heroin, cocaine, or LSD? _____
12. Used too much alcohol? _____
13. Used marijuana or hashish? _____
14. Used hard drugs such as heroin, cocaine, or LSD? _____

Please answer the following questions about your romantic partner (e.g., boyfriend, girlfriend, husband, wife, spouse).

1. How many times a week do you hang out with your partner? _____
2. Do other people disapprove of your partner (circle one)? yes no
3. Has anyone ever said that your romantic partner is a bad influence on you? yes
no
4. Do you still hang around with your romantic partner even though other people think they are a bad influence on you (circle one)? yes no

During the past 90 days how many times has your partner:

5. Lied or been rude to other people: _____
6. Purposely damaged or destroyed property that did not belong to them: _____
7. Stolen something less than \$5: _____
8. Stolen something worth more than \$5 but less than \$100? _____
9. Stolen something worth more than \$100? _____
10. Gone into or tried to go into a building to steal something? _____
11. Gone joyriding, that is, taking a motor vehicle such as a car or motorcycle for a ride or drive without the owner's permission? _____
12. Hit someone with the idea of hurting that person? _____
13. Attacked someone with a weapon or with the idea of seriously hurting that person? _____
14. Used a weapon, force of strong-arm methods to get money of things from people?

15. Sold hard drugs such as heroin, cocaine, or LSD? _____

16. Used too much alcohol? _____

17. Used marijuana or hashish? _____

18. Used hard drugs such as heroin, cocaine, or LSD? _____

Barriers to Employment

Directions: After reading some statements about employment, please rank the following by circling a number on a scale of 1 to 5 according to how each item affects you getting and keeping a job. 1 = Not a barrier and 5 = Strong barrier.

Item	1	2	3	4	5
	Not a barrier				Strong barrier
1. Having less than a high school education	1	2	3	4	5
2. Work limiting health conditions (illness/injury)	1	2	3	4	5
3. Lack of adequate job skills	1	2	3	4	5
4. Lack of job experience	1	2	3	4	5
5. Child care	1	2	3	4	5
6. Lack of information about jobs	1	2	3	4	5
7. Drug/alcohol addiction	1	2	3	4	5
8. Domestic violence	1	2	3	4	5
9. Physical disabilities	1	2	3	4	5
10. Mental illness	1	2	3	4	5
11. Lack of work clothing	1	2	3	4	5
12. No jobs in the community	1	2	3	4	5
13. No jobs that match my skills/training	1	2	3	4	5
14. Being a single parent	1	2	3	4	5
15. Need to take care of young children	1	2	3	4	5
16. Problems with getting to job on time	1	2	3	4	5

17. Lack of confidence	1	2	3	4	5
18. Lack of support system	Not a barrier	2	3	4	Strong barrier
19. Lack of coping skills for daily struggles	1	2	3	4	5
20. Anger management	1	2	3	4	5

Workplace Peer and Supervisor Support

Please think of your current job, or if not currently employed, your most recent job. For the following questions, please think of the two individuals to whom you feel closest at work; that is, those co-workers – peers with whom you work – to whom you feel most comfortable turning for support and advice and whose opinion you really value. How often have they:

1. Talked you through problems at work

0	1	2	3	4
Never		Once a Day		Several Times a Day

2. Given you suggestions for easier ways of accomplishing tasks

0	1	2	3	4
Never		Once a Day		Several Times a Day

3. Talked to a supervisor or coworker about your behavior when you felt overwhelmed at work

0	1	2	3	4
Never		Once a Day		Several Times a Day

4. Given you positive feedback about your work

0	1	2	3	4
Never		Once a Day		Several Times a Day

5. Provided you with encouragement and praise when you felt overwhelmed

0	1	2	3	4
Never		Once a Day		Several Times a Day

6. Indicated that he/she was available to help you when you were having a stressful shift

0	1	2	3	4
Never		Once a Day		Several Times a Day

7. Offered to assist or help with your work

0	1	2	3	4
Never		Once a Day		Several Times a Day

8. Given you his/her attention when you have described problems at work

0	1	2	3	4
Never		Once a Day		Several Times a Day

9. Listened to your problems with work and supported you the decisions you made

0	1	2	3	4
Never		Once a Day		Several Times a Day

10. Shared his/her knowledge with you

0	1	2	3	4
Never		Once a Day		Several Times a Day

For the following questions, please think of your supervisor or supervisors at work. How often have they:

1. Talked you through problems at work

0	1	2	3	4
Never		Once a Day		Several Times a Day

2. Given you suggestions for easier ways of accomplishing tasks

0	1	2	3	4
Never		Once a Day		Several Times a Day

3. Talked to a supervisor or coworker about your behavior when you felt overwhelmed at work

0	1	2	3	4
Never		Once a Day		Several Times a Day

4. Given you positive feedback about your work

0	1	2	3	4
Never		Once a Day		Several Times a Day

5. Provided you with encouragement and praise when you felt overwhelmed

0	1	2	3	4
Never		Once a Day		Several Times a Day

6. Indicated that he/she was available to help you when you were having a stressful shift

0	1	2	3	4
Never		Once a Day		Several Times a Day

7. Offered to assist or help with your work

0	1	2	3	4
Never		Once a Day		Several Times a Day

8. Given you his/her attention when you have described problems at work

0	1	2	3	4
Never		Once a Day		Several Times a Day

9. Listened to your problems with work and supported you the decisions you made

0	1	2	3	4
Never		Once a Day		Several Times a Day

10. Shared his/her knowledge with you

0	1	2	3	4
Never		Once a Day		Several Times a Day

Neighborhood Characteristics Questionnaire

Directions: We would like to know how you feel about the neighborhood where you live; the area approximately one mile around your home. For each statement below, please pick the number that is closest to how you feel.

1	2	3	4	5
Strongly Agree	Agree	Neutral (neither agree nor disagree)	Disagree	Strongly Disagree

- ____ 1. I feel safe walking in my neighborhood, day or night.
- ____ 2. Violence is not a problem in my neighborhood.
- ____ 3. My neighborhood is safe from crime.
- ____ 4. People around me are willing to help their neighbors.
- ____ 5. People in my neighborhood generally get along with each other
- ____ 6. People in my neighborhood can be trusted.
- ____ 7. People in my neighborhood share the same values.

1	2	3	4
Often	Sometimes	Rarely	Never

- ____ 1. About how often do you and people in your neighborhood do favors for each other? By favors, we mean such things as watching each other's children, helping with shopping, lending garden or house tools, and other small acts of kindness.
- ____ 2. When a neighbor is not at home or on vacation, how often do you and other neighbors watch over their property?
- ____ 3. How often do you and other people in the neighborhood ask each other for advice about personal things such as child-rearing or job openings?

1	2	3	4
Often	Sometimes	Rarely	Never

____ 4. How often do you and other people in your neighborhood visit in each other's homes or speak with each other on the street?

____ 5. During the past six months, how often was there a fight in your neighborhood in which a weapon was used?

____ 6. During the past six months, how often were there gang fights in your neighborhood?

____ 7. During the past six months, how often, was there a sexual assault or rape in your neighborhood?

____ 8. During the past six months, how often was there a robbery or mugging in your neighborhood?

VITA

Kaitlin M. Sheerin (M.A., University of Missouri) is a doctoral candidate in the Department of Psychological Sciences at the University of Missouri. She earned her B.A. in Psychology and German from Rutgers University in 2012 and an M.A. in Clinical Psychology from the University of Missouri in 2017. Kaitlin currently lives in Providence, Rhode Island where she is completing her predoctoral internship at the Alpert Medical School of Brown University.

Kaitlin was born in New Brunswick NJ and raised in East Brunswick, NJ. Throughout high school, she volunteered with several organizations that helped underserved youths. Since that time, she has been interested in youth mental health and wanted to pursue a career in clinical psychology. During college, Kaitlin worked at a residential treatment facility for youths with severe mental health concerns. After graduation from Rutgers University, Kaitlin worked as a research assistant at the University of Pennsylvania.

While at the University of Missouri, Kaitlin engaged in research, clinical work, and teaching under the mentorship and supervision of Dr. Charles Borduin. Upon graduation, she will be starting an NIH-funded postdoctoral research fellowship at Brown University. Ultimately, Kaitlin plans to pursue an academic research career during which she will research behavioral health treatments for individuals involved in the justice system across the lifespan. Kaitlin would also like to remain involved in the training and supervision of the next generation of clinical psychologists.