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PSYCHOPATHIC TRAITS, SUBSTANCE USE, AND MOTIVATION TO CHANGE:

THE EFFECTIVENESS OF MOTIVATIONAL INTERVIEWING

WITH AT-RISK ADOLESCENTS

by

Christopher Thomas Alan Gillen

A Dissertation
Submitted to the Graduate School,
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for the Degree of Doctor of Philosophy

August 2018

PSYCHOPATHIC TRAITS, SUBSTANCE USE, AND MOTIVATION TO CHANGE:

THE EFFECTIVENESS OF MOTIVATIONAL INTERVIEWING

WITH AT-RISK ADOLESCENTS

by Christopher Thomas Alan Gillen

August 2018

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ABSTRACT

PSYCHOPATHIC TRAITS, SUBSTANCE USE, AND MOTIVATION TO CHANGE:

THE EFFECTIVENESS OF MOTIVATIONAL INTERVIEWING

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The current study is the first known study to investigate the effectiveness of Motivational Interviewing (MI) as a motivational enhancement intervention in at-risk adolescents with psychopathic traits and substance use (SU) problems. Further, it examined whether such an intervention can improve problematic behavior (i.e., aggression, delinquency) and treatment responsivity deficits (i.e., motivation to change) associated with psychopathy and SU. The effectiveness of MI was examined using a randomized treatment-control design in which adolescents were assigned to either a three-session group-based MI intervention and a residential treatment or a group receiving only the residential treatment without the MI component. Participants were 95 adolescent males (age range between 16 and 18; $M = 16.91$). Although MI improved motivation to change SU relative to the residential program, youth in the MI group did not report fewer SU problems or antisocial behavior compared to youth in the control group. Similarly, MI did not consistently improve motivation to change psychopathy-related behavior compared to the residential program and did not reduce the expression of core psychopathic personality traits across time. Implications for how the current MI protocol can be improved through future research are discussed.

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DEDICATION

This dissertation is dedicated to my mother for her outstanding support and love throughout my life.

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CHAPTER I – INTRODUCTION

Although crime has decreased in the United States since the 1990s (Furdella & Puzzanchera, 2015), it remains a significant issue negatively influencing society and victims. There is reason for concern regarding juvenile offending and delinquency, with research indicating that within seven years of leaving prison, juvenile offenders have general recidivism and violent recidivism rates approaching 60% and 36%, respectively (Olver, Stockdale, & Wong, 2012). Consequently, research investigating adolescent risk factors for offending and the effectiveness of correctional interventions is important for better understanding delinquency and reducing recidivism.

Two factors that are associated with increased risk for antisocial behavior and reduced treatment amenability are psychopathy and substance use (SU). Research has found that psychopathy is a risk factor for violence (Baskin-Somers & Baskin, 2016; Leistico, Salekin, DeCoster, & Rogers, 2008; Olver, Lewis, & Wong, 2013) and recidivism (Basque, Toupin, & Côté, 2013; Murrie & Cornell, 2002) and is predictive of reduced responsiveness to treatment (Leistico & Salekin, 2003; Olver et al., 2013). SU is also predictive of adult persistent offending (Murphy, Brecht, Huang, & Herbeck, 2012; Windle & Wiesner, 2004) and diminished compliance with SU rehabilitative programs (Breda & Heflinger, 2004; Sylwestrzak, Overholt, Ristau, & Coker, 2015; Wisdom, Cavaleri, Gogel, & Nacht, 2011).

However, risk factors alone do not ensure that offenders will recidivate or exhibit poor responses to treatment. In general, responsivity factors such as motivation to change (Abrams, 2012; Salekin, Rogers, & Ustad, 2001; Salekin, Yff, & Neumann, 2002), exist that foster resilience and improve the probability of a positive treatment

response. Interventions designed to increase motivation, such as Motivational Interviewing (MI; Miller & Rollnick, 2013), have been found to improve adolescent engagement and interest in SU treatment programs (D'Amico et al., 2013; Stein et al., 2006) that can reduce quantity of alcohol and marijuana use, associated interpersonal problems, and antisocial behavior (Clair et al, 2011; Clair-Michaud et al., 2016; D'Amico et al., 2015; Stein et al., 2010; 2011). Similarly, brief motivational interventions in youth with psychopathic traits are related to increased treatment amenability and reductions in risk (Salekin, Tippey, & Allen, 2012), as well as improved compliance and enthusiasm toward non-treatment related activities (i.e., problem-solving tasks; Salekin, Lester, & Sellers, 2012).

Nevertheless, no known study has investigated the efficacy of MI in youth with psychopathic traits and whether brief motivational interventions can reduce problematic behavior associated with concurrent SU and psychopathy in at-risk adolescents. The current study aimed to examine the effectiveness of MI for adolescents attending a residential program relative to the standard intervention available in the program. Specifically, the ability of MI to increase motivation to change, improve engagement in the standard treatment, and reduce short-term longitudinal risk outcomes associated with psychopathy and SU (i.e., aggression, delinquency, recidivism) was examined.

Even though other interventions have demonstrated some initial promise in treating youth with psychopathic traits (i.e., Caldwell, McCormick, Wolfe, & Umstead, 2012) and SU problems (i.e., Ahuja, Crome, & Williams, 2013), MI is unique in its potential ability to target psychopathy and SU integratively by improving shared deficits in motivation and treatment engagement that are characteristic of youth with both factors

(Falkenbach, Poythress, & Heide, 2003; Melnick, De Leon, Hawke, Jainchill, & Kressel, 1997; O'Neil, Lidz, & Heilbrun, 2003; Wisdom et al., 2011). In the following sections, the constructs investigated in the present study (i.e., psychopathy, SU, motivation to change, and MI) are reviewed.

Psychopathy

Development and Assessment

In *The Mask of Sanity* (Cleckley, 1964; originally published in 1941), psychopathy was originally conceptualized as a personality pattern marked by superficial charm and displays of antisociality, pathological lying, manipulation, and remorselessness. This description was later refined with the Psychopathy Checklist and its revised version (PCL-R; Hare, 2003). Per the four-facet model (Neumann, Johansson, & Hare, 2013; Sohn & Lee, 2016), psychopathic personality traits (Factor 1) consist of interpersonal (i.e., superficial charm, manipulation) and affective (i.e., shallow affect, callousness) facets, whereas behavioral characteristics (Factor 2) are composed of lifestyle (i.e., impulsivity, irresponsibility) and antisocial (i.e., poor behavior control, criminal versatility) facets. The four-facet model also applies to psychopathy in child and adolescent samples (Das, de Ruiter, Doreleijers, & Hillege, 2009; Kosson et al., 2013; Neumann, Kosson, Forth, & Hare, 2006).

Although much of the literature has found that the adolescent adapted version the PCL-R, the Psychopathy Checklist: Youth Version (PCL:YV; Forth, Kosson, & Hare, 2003), is a reliable and valid measure of adolescent psychopathy (Dillard, Salekin, Barker, & Grimes, 2013; Pechorro, Barroso, Maroco, Vieira, & Gonçalves, 2015), there is mounting support for the use of self-report instruments to measure psychopathic traits

in youth. The Youth Psychopathic Traits Inventory (YPI; Andershed, Kerr, Stattin, & Levander, 2002) and the Inventory of Callous-Unemotional Traits (ICU; Frick, 2003) are two such measures that have been widely used in research and that were used in the current study. Unlike the YPI which was designed to measure the core personality and behavioral features of the construct (Andershed et al., 2002), the ICU assesses the affective features to the exclusion of interpersonal and behavioral traits.

Studies examining the YPI have demonstrated support for a three-factor structure comparable to the interpersonal (Grandiose-Manipulative; GM), affective (Callous-Unemotional; CU), and lifestyle facets (Impulsive-Irresponsible; II) of the PCL:YV (Declercq, Markey, Vandist, & Verhaeghe, 2009; Fossati et al., 2016; Neumann & Pardini, 2014). A three-factor structure consisting of Callousness (i.e., a lack of empathy), Uncaring (i.e., lack of concern for others), and Unemotional (i.e., deficiency in emotional expression) components has been identified with the ICU (Kimonis et al., 2008; Pihet, Etter, Schmid, & Kimonis, 2015; Roose, Bijttebier, Decoene, Claes, & Frick, 2010). Some studies have found that the Unemotional factor has low reliability (Feilhauer, Cima, & Arntz, 2012) and is not significantly correlated with the other ICU factors (Berg et al., 2013); however, all three ICU scales are correlated with the YPI-CU factor (*rs* = .20 to .33; Ansel et al., 2015).

Stability of Psychopathic Traits

Although the assessment of psychopathic traits in youth is improving with well-validated self- and clinician-reported scales, some controversy remains. There have been criticisms that some traits, such as a grandiose sense of self, limited remorse and empathy, a failure to accept blame, and irresponsibility, are not atypical in youth

(Seagrave & Grisso, 2002). That is when juveniles exhibit these traits it may be because they have not yet fully developed the higher-order cognitive and executive skills designed to regulate these characteristics.

This criticism is dependent on the notion that psychopathy-linked traits in youth are transient and not accurate longitudinal predictors of risk. Some research suggests that adolescent psychopathic traits may be less stable than the adult construct (Cauffman, Skeem, Dmitrieva, & Cavanagh, 2016), and there appears to be individual differences in stability, with some youth showing decreases in psychopathic traits over time (Kimonis, Skeem, Cauffman, & Dmitrieva, 2011; Pardini & Loeber, 2008). However, other studies suggest that adolescent psychopathic traits are stable, show limited change over time, and are not only fleeting expressions of typical development (Feilhauer et al., 2012; Hemphälä, Kosson, Westerman, Hodgins, 2015; Muñoz, Kerr, & Besic, 2008; Neumann, Wampler, Taylor, Blonigen, & Iacono, 2011).

For instance, in a study investigating a community sample (age 12-15), total YPI scores showed a moderate to high degree of stability as measured by ICCs over four years (.52- .67; Muñoz et al., 2008). When individual factors are examined with other clinical ratings and self-report measures, interpersonal and behavioral domains appear to show moderate to strong short-term stability (Lee, Klaver, Hart, Moretti, & Douglas, 2009). However, research examining affective features has been less consistent, with some studies noting decreases over time and others finding strong stability (Feilhauer et al., 2012; Lee et al., 2009).

Longitudinal research investigating psychopathic traits from childhood to adolescence found that self and parent-reported psychopathic personality traits are

relatively stable (Lynam et al., 2009; Obradovic, Pardini, Long, & Loeber, 2007). However, subsequent analyses with these data revealed that *mean* psychopathy ratings, including mean CU scores, increased in mid-adolescence and decreased as participants approached adulthood (Lynam et al., 2009; Pardini & Loeber, 2008). Moreover, these studies also noted individual differences in stability, including increases and decreases in callousness over time, with other research noting mean decreases in total PCL:YV scores over a two-year follow-up (Kimonis et al., 2011). Together, the results of these studies suggest that psychopathic traits may exhibit some malleability, especially from mid to late adolescence. Nevertheless, other research has discovered that adolescent psychopathic traits remain rather stable during this formative transition period from adolescence to adulthood. For instance, psychopathic traits exhibit moderate to strong stability from late adolescence over five to 11 year periods into adulthood (Hemphälä et al., 2015; Lynam, Caspi, Moffitt, Loeber, & Stouthamer-Loeber, 2007; Neumann et al., 2011). This pattern was consistently true of the behavioral aspects of psychopathy.

In sum, these findings indicate that psychopathy-linked traits are relatively stable across most development periods. Thus, it seems that juvenile psychopathic traits do not solely represent temporary maturational deficits as proposed by Seagrave and Grisso (2002). Because there are individual differences in stability, with some studies indicating mean decreases in psychopathy during adolescence (Kimonis et al., 2011; Lynam et al., 2009; Pardini & Loeber, 2008), it is important to avoid assumptions that psychopathy is a persistent, unchangeable condition in youth. Although juvenile psychopathy appears to show sufficient temporal stability to predict long-term antisocial outcomes, some

plasticity in the expression of these traits suggests that treatment may be successful in spite of contrary conceptualizations of the construct (Harris & Rice, 2006).

Psychopathy and Antisocial Behavior

Similar to adult offenders (i.e., Olver et al., 2013; Wallinius, Nilsson, Hofvander, Anckarsater, & Stalenheim, 2012), research has found that adolescent psychopathy is moderately related to present and future displays of antisocial behavior, particularly non-sexually violent and nonviolent offending (Baskin-Somers & Baskin, 2016; Basque et al., 2013). Even though other studies have found that juvenile psychopathy is a weak predictor of adult offending (Cauffman, Kimonis, Dmitrieva, & Monahan, 2009; Sitney, Caldwell, & Caldwell, 2016), most studies have noted that psychopathy, especially the behavioral features, can predict recidivism into adulthood (Basque et al., 2013; Gretton, Hare, & Catchpole, 2004; Schmidt, Campbell, & Houlding, 2011). In terms of violence, psychopathic traits are related to both instrumental and reactive forms of aggression (Berg et al., 2013), with the interpersonal features most closely associated with predatory violence and the behavioral traits more commonly, but not exclusively, related to reactive aggression in adolescents (Blais, Solodukhin, & Forth, 2014; Flight & Forth, 2007).

Despite some findings that the YPI does not predict recidivism and antisocial behavior as well as the PCL:YV (Colins, Vermeiren, De Bolle, & Broekaert, 2012; Shepherd & Strand, 2016), most research examining the link between psychopathy and antisocial behavior has cited favorable results using self-report measures. For instance, YPI personality and behavioral facets are significantly related to delinquency, aggression, violent offending, property offenses, and criminal versatility (Declercq et al., 2009; Fossati et al., 2016; Nijhof et al., 2011). Consistent with Nijhof et al. (2011), research

investigating incarcerated adolescents from the U.S. has found that violent recidivism is uniquely associated with the core psychopathic personality traits as measured by the YPI (Salekin, Debus, & Barker, 2010).

Such findings highlight the importance of interpersonal and affective traits, particularly CU traits, in understanding the association between psychopathy and antisocial behavior (see Frick, Ray, Thornton, & Kahn, 2014). CU traits predict increased delinquency, recidivism, adult persistent offending, and violence, particularly proactive forms of aggression (Byrd, Kahn, & Pardini, 2013; Kimonis, Kennealy, & Goulter, 2016; Orue, Calvete, & Gamez-Guadix, 2016). High, persistent CU profiles are also associated with future conduct problems and self-regulation difficulties compared to less stable CU-patterns (Fanti, Colins, Andershed, & Sikki, 2017). In terms of specific CU dimensions, ICU callous and uncaring traits are more consistently and strongly correlated with aggression and delinquency, respectively, than the unemotional factor (Ansel et al., 2015; Kimonis et al., 2008; Roose et al., 2010).

These results suggest that like the PCL:YV, YPI and ICU composite and facet scores are related to specific risk outcomes with adolescents. Longitudinal studies seem to indicate that CU features and behavioral traits, which are among the most stable, are most strongly associated with adult-persistent antisocial behavior. Nevertheless, not all adolescents with psychopathy-linked traits engage in recurrent problematic behavior. The plasticity and individual differences in the stability of psychopathic traits are encouraging for the criminal justice system, as the increased malleability can provide an opportunity where psychopathy, and the antisocial behavior associated with it, can be sufficiently targeted with treatment.

Psychopathy and Treatment Effectiveness

Research has noted mixed findings in regards to the effectiveness of treatment in adult offenders with psychopathic traits (see Harris & Rice, 2006). However, with the noted plasticity of psychopathic traits during youth, interventions targeting these traits in juveniles may be more effective than with adults. Even though some studies have found that psychopathy is related to poorer treatment response and compliance (Falkenbach et al., 2003; Manders, Deković, Asscher, van der Laan, & Prins, 2013; Olver et al., 2013; O'Neil et al., 2003), most research supports the utility of early clinical intervention, especially when youth remain compliant with the intervention (Caldwell, 2011; Caldwell et al., 2012; White et al., 2013).

Research investigating the effectiveness of a specialized, high intensity cognitive-behavioral treatment (the Mendota Juvenile Treatment Center treatment; MJTC) in youth scoring high on the PCL:YV ($M > 27$) found that treatment was most effective at reducing violence and was related to longer time spent in the community before recidivating relative to outcomes for youth receiving a standard control treatment (Caldwell, Skeem, Salekin, & van Rybroek, 2006). In terms of the specific traits associated with MJTC treatment success, Caldwell (2011) noted that interpersonal features were especially predictive of decreases in general and violent recidivism more than 54 months after release. Further, MJTC treatment completion is related to decreases in self-reported interpersonal and CU traits up to 90 and 180 days into the program, as well as improved clinical ratings of institutional behavior and treatment compliance (Caldwell et al., 2012). Collectively, these studies suggest that some forms of intensive

cognitive-behavioral treatment can reduce recidivism and the expression of psychopathic traits, particularly the personality features, in high-risk offenders.

Additional research has also supported the use of family-focused therapies with adolescents with psychopathic traits. One such therapy with children displaying conduct disorder (CD) and psychopathic traits is parent training (McDonald, Dodson, Rosenfield, & Jouriles, 2011). Children of mothers who received parental training focusing on child management showed reductions in parent-rated psychopathic personality traits over a twenty-month period compared to families who did not receive the training. Functional Family Therapy (FFT) which addresses the needs and behaviors of the family has also shown early promise in incarcerated juvenile offenders with CU traits (White et al., 2013). White and colleagues found that ICU scores were related to reductions in violence and conduct problems and improved family functioning after treatment. Further, CU traits were not related to increased noncompliance or dropout, indicating that FFT could be important in maintaining engagement in youth who often have reduced treatment compliance.

Although studies examining psychopathy and treatment in adolescences is a developing field, most of the current literature indicates that psychopathic traits, especially the core personality traits, can be reduced and targeted to decrease associated antisocial behavior via high-intensity treatment. This emerging evidence supports theories that the plasticity of psychopathic traits in adolescence may make these types of offenders more amenable to treatment. Nevertheless, treatment considerations involving at-risk youth often incorporate other factors in addition to psychopathy. A particularly

salient factor that is associated with psychopathy and is instrumental in treatment planning and risk assessment is SU.

Substance Use

Substance Use as a Criminogenic Risk Factor

Illicit drug and alcohol use is an alarming issue within juvenile corrections. Young offenders demonstrate higher rates of SU disorders, abuse, and dependence compared to children from the general population (Golzari, Hunt & Anoshiravani, 2006; Konecky, Cellucci, Mochrie, 2016; Mulvey, Schubert, & Chassin, 2010). Golzari et al. (2006) noted that substance abuse prevalence in juvenile correctional environments can be as high as 59%, whereas only 11% of adolescents from the general population use any illicit substance (Center for Behavioral Health Statistics and Quality, 2015).

SU is also predictive of delinquency, antisocial behavior, and recidivism in adolescents (D'Amico, Edelen, Miles, & Morral, 2008; Fite et al., 2014; Hicks, Schalet, Malone, Iacono, & McGue, 2011), as well as reduced treatment compliance and completion of rehabilitation (Stein, Deberard, & Homan, 2013; Sylwestrzak et al., 2015). In particular, juvenile offenders with SU problems and more severe and frequent SU profiles are at increased risk to reoffend (van der Put, Creemers, & Hoeve, 2014; Yessine & Bonta, 2012), whereas high-risk adolescent offenders have been found to have the highest SU rates before and during the commission of crime and the highest prevalence of alcohol abuse (Mulder, Vermunt, Brand, Bullens, & Marle, 2012).

Consistent with the relationship between alcohol and high-risk offending found by Mulder et al. (2012), research has noted that alcohol use is a major risk factor for aggression, particularly for severe binge drinking and violence (Marcus & Jamison, 2013;

Salas-Wright, Reingle Gonzalez, Vaughn, Schwartz, & Jetelina, 2016). Not only is binge drinking related to violence throughout adolescence (Salas-Wright et al., 2016), alcohol use is primarily associated with reactive violent crime (Boden, Fergusson, & Horwood, 2012; 2013; Felson, Burchfield, & Teasdale, 2007; Putnins, 2003), such that alcohol consumption is directly related to increases in reactive aggressive behavior (Felson, Teasdale, & Burchfield, 2008).

Comparable research investigating other substances, particularly marijuana, has been more contradictory. Although young offenders use marijuana more than other substances based on urine screens (Dembo, Belenko, Childs, Greenbaum, & Wareham, 2010) and self-report (Mulvey et al., 2010), most studies have challenged the direct relation between violence and cannabis use (Marcus & Jamison, 2013; Putnins, 2003; Wei, Loeber, & White, 2004). Unlike alcohol use, violence is usually only related to an early onset of marijuana use in studies citing a positive relation, especially before age 13 or 15 (Brady, Tschann, Pasch, Flores, & Ozer, 2008). In general, an early onset of SU is predictive of using force to obtain things from others, gang involvement, adult persistent offending, and increased risk for bullying, delinquency, and cruelty to others (Ellickson & McGuigan, 2000; Gordon, Kinlock, & Battjes, 2004; Murphy et al., 2012).

The literature base provides evidence that adolescent SU is predictive of adult risky behavior longitudinally, particularly heavy alcohol intoxication and early SU onset. These findings highlight the need of targeting specific dimensions of SU and corresponding delinquent behavior to deter future recidivism. However, improvement is still needed in the assessment and treatment of youth with SU problems. This may be accomplished by targeting salient co-occurring factors of SU, such as psychopathy.

Substance Use and Psychopathy

SU and adolescent psychopathy are related to similar constructs, including depression and anxiety (Gillen, Barry, & Bater, 2016; Kubak & Salekin, 2009; Price, Salekin, Klinger, & Barker, 2013) and externalizing problems, such as violence and adult persistent offending. Thus, it is not surprising, that the two factors are related in adolescent populations (Gillen et al., 2016; Kimonis, Tatar, & Cauffman, 2012; O'Neil et al., 2003; Vaughn, Edens, Howard, & Smith, 2009).

Although some studies have noted moderate correlations between psychopathic personality traits, particularly a lack of empathy and instrumental planning (Loper, Hoffschmidt, & Ash, 2001), as well as self-reported SU proneness (Murrie & Cornell, 2002) and SU frequency (O'Neil et al., 2003), most research has found that Factor 2 traits are more strongly related or exclusively related to multiple SU indices. For instance, self-reported impulsive-irresponsible traits are differentially related to SU severity (Poythress, Dembo, Wareham, & Greenbaum, 2006), hard drug use in boys (i.e., cocaine, ecstasy, heroin; Nijhof et al., 2011), alcohol and marijuana-related problems (Gillen et al., 2016), and SU disorders (Colins, Bijttebier, Broekaert, & Andershed, 2014). Even in studies where psychopathic personality traits are moderately related to SU (Hillege, Das, & de Ruiter, 2010), behavioral traits were still identified as the strongest predictor of alcohol use frequency.

These relations may be may influenced by the associations between behavioral psychopathic traits and affective reactivity and internalizing anxiety symptoms. Not only are self-reported behavioral traits in adolescent offenders uniquely, moderately related to multiple anxiety symptoms (Gillen et al., 2016; Kubak & Salekin, 2009), but adolescent

secondary psychopathy variants most often typified by high impulsivity also include more physical anxiety, worry, and social concern than primary variants defined with higher amounts of psychopathic personality traits (Kimonis, Tatar, & Cauffman, 2012; Lee, Salekin, & Iselin, 2010). Given the relation with anxiety and emotional reactivity, it is not surprising that secondary psychopathy is predictive of SU above primary psychopathy. Apart from higher SU frequencies prior to arrest (Vaughn et al., 2009), high-risk adolescent offenders classified within the secondary subtype are four times more likely to have a SU disorder and are at increased risk for alcohol and drug dependence (Kimonis et al., 2012).

Not only do psychopathy and SU co-occur in high-risk and community juvenile samples, but each factor is associated with motivational deficits to change (i.e., Falkenbach et al., 2003; Melnick et al., 1997), a noted responsivity factor that helps mitigate risk and increase resilience and treatment amenability in youth (Abrams, 2012). Given this shared deficit, interventions that increase motivation to change may be particularly helpful in reducing the shared risk outcomes associated with psychopathy and SU in at-risk adolescent populations. In the remaining sections, motivation to change as a responsivity factor and corresponding treatments are reviewed.

Motivation to Change

Motivation as a Responsivity Factor

Motivation to change is a salient responsivity factor associated with improved treatment completion and reduced risk for recidivism (Abrams, 2012; Salekin et al., 2001; Salekin et al., 2002). According to the Transtheoretical Model of Change (TTM; Prochaska & DiClemente, 1982), readiness to change is one dynamic factor related to

treatment amenability. Regarding stages of change, most juvenile offenders are in the Precontemplation Stage and do not understand that their behavior is problematic (Hemphill & Howell, 2000). Such individuals usually cite external motivations for treatment (i.e., they are forced into treatment; Davis, 2000). Correspondingly, this TTM stage is not strongly related to treatment success (Breda & Heflinger, 2004). However, progress from the Contemplation Stage into the Preparation and Action Stages is marked by increases in understanding of antisocial behavior and intrinsic desire to change. This increased awareness and motivation is characterized by treatment improvement, particularly using traditional correctional programming (Willoughby, Perry, & Vandergoot, 2003). Consistent with self-determination theory (SDT) and conceptualizations of internal readiness to change, clinical child psychologists (Salekin et al., 2001) and juvenile court judges (Salekin et al., 2002) have also noted that intrinsic motivation to engage in treatment is one of the most salient factors in determining likelihood of future treatment success.

Qualitative research has corroborated the importance of motivation to change (Abrams, 2012). Abrams noted that juvenile offenders classified as having low intrinsic motivation to change criminal behavior tended to focus on personal consequences of crime and fear of re-arrest. In contrast, offenders high in motivation cited a desire to change to avoid victimizing others and complete treatment. Unlike youth low in motivation to change, youth with moderate or high motivation also understood that challenges would occur upon release and were cognizant of strategies to control impulsivity and plan possible exit strategies when placed in high-risk situations. In

general, motivation was associated with enhanced efficacy in generating prosocial alternatives to crime and treatment engagement.

Additionally, motivation is a specific responsivity factor in youth with psychopathic traits and SU problems. Not only is psychopathy associated with reduced motivation to change on average (Falkenbach et al., 2003), but when motivation is measured along a continuum and treated as a moderator, low motivation is also related to increased risk to offend (Gillen, 2013) and violent recidivism up to three years after release from detention (Salekin, Lee, Schrum, Dillard, & Kubak, 2010) in youth with psychopathic traits. However, when motivation to change is high, psychopathy is not predictive of increased criminological risk or violence. In terms of SU, adolescents have reduced internal desire to change SU behavior and are less likely to complete SU treatment programs (Breda & Heflinger, 2004; Clair et al., 2011; DiClemente, Garay, & Gemmell, 2008; Melnick et al., 1997; Sylwestrzak et al., 2015; Wisdom et al., 2011). Compounding this risk, at-risk juveniles in court-mandated treatment and presenting with externalizing psychopathology are especially at risk to exhibit low intrinsic motivation to change (Austin, Hospital, Wagner, & Morris, 2010; Melnick et al., 1997).

In adolescence, deficits in intrinsic motivation to change are associated with poor treatment engagement and increased antisocial behavior, especially in youth with SU problems and psychopathic traits. Moreover, given the comorbidity between SU and psychopathy, motivation is a particularly important shared responsivity factor in these high-risk adolescents. Consequently, increasing motivation in youth displaying these traits could be effective in getting them to participate in treatment that can reduce

delinquency and SU. One efficient and cost-effective treatment designed to increase intrinsic motivation to change is MI.

Motivational Interviewing (MI)

MI is a person-centered intervention designed to increase awareness about the problematic nature of certain behaviors while helping individuals establish goals that can facilitate change (Miller & Rollnick, 2013). Unlike other interventions, MI does not rely on direct instruction to facilitate change. Rather than providing solutions *to* the client, therapists collaborate *with* clients in a nonjudgmental and empathic manner, discussing their perspectives and reasons for change (i.e., change talk). In this sense, therapists work with clients to evoke their motivations to change. Not only can this approach reduce discord, it allows the client to become an active participant and acknowledges that he/she brings vital information to therapy that the therapist does not possess. When presented with ambivalence or contrary opinions for and against change, therapists validate clients' underlying feelings and do not directly challenge statements resistant to change. Instead, therapists strategically guide clients toward ideas supportive of change.

Although change rarely progresses linearly or without ambivalence or relapse (Miller & Rollnick, 2013; Yong, Williams, Provan, Clarke, & Sinclair, 2015), research has supported the efficacy of MI to increase intrinsic motivation to change and engagement in treatment in a variety of contexts and populations, including adolescents (D'Amico et al., 2012; 2015; Hall, Stewart, Arger, Athenour, & Effinger, 2014; Stein et al., 2006). These findings are particularly noteworthy given that many adolescents are reluctant to volunteer for treatment and usually cite external motivators to participate (Feldstein Ewing, Walters, & Baer, 2013). Because MI offers adolescents an opportunity

to have their opinions heard and validated, it may be especially useful for at-risk youth whose views may be routinely dismissed by authority figures who dictate how they should think and behave (i.e., in forensic or residential settings; Stein, et al., 2006).

Most importantly, MI participation is associated with therapeutic improvement in adolescents. When viewed within the context of the TTM, research has found that juveniles receiving individualized multi-session MI to treat SU show improvements in motivation consistent with stages of change progress (Erol & Erdogan, 2008; Hall et al., 2014). In both studies, MI was associated with progression from the Contemplation stage toward the Action and Maintenance stages most closely associated with treatment improvement (Willoughby et al., 2003). Further, Hall et al. found that MI was related to a series of successive changes in motivation, from fewer concrete thoughts of change to making specific goals to facilitate change, that were predictive of positive SU change 16 weeks after treatment.

Even though MI was originally designed as an individual intervention, research has also supported its use in group settings (for a review, see Young, 2013), including with adolescents (D'Amico et al., 2012; 2015; D'Amico, Osilla, & Hunter; 2010). Similar to individually administered MI, group MI aims to facilitate change through member-generated conversation. However, group leaders face additional challenges when collaborating with youth in a group apart from fostering each member's change talk. Not only must leaders limit confrontation between members that can negatively influence the progress of the group, leaders also should encourage collaboration (i.e., group cohesion) and empathy between adolescents while guiding members that hold disparate values and beliefs toward change (e.g., validating sustain talk with some

members while reflecting change talk with others; Feldstein Ewing et al., 2013; Houck et al., 2015; Osilla et al., 2015).

Nevertheless, studies have shown that the integrity of MI can be maintained when conducted in groups with at-risk adolescents with SU problems like individual motivational interventions (D'Amico et al., 2010; 2012; 2013; 2015). D'Amico and colleagues also noted that group MI was associated with improvements in member-driven change talk, autonomy, and empathy, particularly when compared to a control 12-step group therapy without an MI component. Given the challenges of leading MI groups with teens and evidence suggesting that adolescent group interventions can limit treatment success (i.e., Weiss et al., 2005), its effectiveness may seem counterintuitive; however, the group dynamic may benefit young people by allowing adolescents to feel more comfortable in therapy or showing that they are not alone in their feelings or thoughts related to change (Feldstein Ewing et al., 2013). Despite adolescent MI group therapy only receiving recent research attention, support of motivational group interventions with at-risk youth is growing, including in juveniles with SU problems and psychopathic traits.

Motivational Interventions, Substance Use, and Psychopathy

Most research investigating the effectiveness of MI with adolescents has focused on SU. Most notably, research has found that MI can improve SU treatment engagement, increase abstinence, and reduce longitudinal negative outcomes in high-risk youth (Brown et al., 2015; O'Leary-Tevyaw & Monti, 2004**;** Smith, Ureche, Davis, & Walters, 2015; Stein et al., 2006; 2010; 2011). Compared to other interventions (i.e., relaxation training; RT), MI may function by decreasing negative SU treatment engagement (i.e.,

positive references toward drug use) that hinders the efficacy of rehabilitation (Stein et al., 2006). Other studies have also noted that increases in motivation to change during treatment are predictive of decreases in negative SU treatment engagement as well as increases in positive engagement (i.e., discussion of the costs of drug use; Clair et al., 2011).

Although some research has found that the long-term benefits of group MI are not significantly better than other group therapies (i.e., D'Amico et al., 2013), other studies have found that pre-treatment group MI is associated with better outcomes than control treatment, especially in Hispanic youth (Clair et al., 2013). Specifically, research has found that pre-intervention group MI is associated with greater reductions in adolescent alcohol and marijuana use (Stein et al., 2010), associated consequences of marijuana use (i.e., missing school and problematic peer and familial relationships; Stein et al., 2011), and aggressive behavior (Clair-Michaud et al., 2016) compared to RT.

Unlike youth with SU problems, no published research to date has examined the effectiveness of MI to reduce the expression of psychopathic traits and its associated behavior. Nevertheless, recent studies investigating the effects of other brief motivational group interventions in youth with psychopathic traits have been promising. One study examined the effectiveness of a mental model intervention, which included a motivational component emphasizing the importance of treatment completion, to increase motivation for treatment while simultaneously decreasing the level of psychopathic traits in juvenile offenders with comorbid CD and callous traits (Salekin, Tippey et al., 2012). During the 12-week intervention period, self-reported interpersonal, affective, and behavioral traits decreased across three separate measurement periods. Comparable to

other studies on psychopathy (i.e., Caldwell et al., 2012), interpersonal traits showed the greatest decreases throughout treatment. The intervention was also associated with moderate improvements in overall self-reported treatment amenability, including motivation to change (d = .49), and decreases in risk to recidivate.

Comparable results were noted by a similar study investigating a different brief motivational intervention with youth displaying CD and psychopathic traits (Salekin, Lester, & Sellers, 2012). Juveniles were randomly assigned to either a treatment or control group in which they received a presentation outlining that intelligence is plastic and increases with age (treatment) or that intelligence is inflexible and largely based on genetic factors (control). The treatment intended to motivate youth toward the feasibility of cognitive change. Adolescents receiving the treatment presentation displayed increased self-reported motivation to change and interest in participating in a problem-solving task than those who were informed that intelligence is rigid. Although educational in nature, Salekin, Lester et al. (2012) concluded that brief interventions that increase motivation can increase compliance and enthusiasm to complete tasks that youth may otherwise have little desire to complete.

Despite research supporting the use of brief motivational group interventions in youth with psychopathic traits and SU problems, no study has examined the effectiveness of MI in youth with psychopathic traits or whether a single motivational intervention can reduce shared risk outcomes (i.e., aggression, delinquency) associated with both constructs.

The Current Study

The purpose of the current study was to examine whether a group-based MI intervention can be delivered to at-risk youth in a residential setting to reduce co-occurring psychopathic traits and SU problems. Specifically, the effectiveness of a three-session MI intervention to increase motivation to change psychopathic features and SU compared to the residential treatment, as usual, was examined. Further, motivation to change as a predictor of institutional behavior was examined. Lastly, the effectiveness of MI to decrease longitudinal risk-outcomes including the severity and frequency of SU, self-reported psychopathic traits, aggression, delinquency, and recidivism up to four months after completion of the residential program was analyzed. As such, this study was the first known effort to research the effectiveness of MI as a psychopathy intervention and to consider whether a motivational group intervention can target shared risk (i.e., aggression, delinquency) and responsivity (e.g., motivation to change) factors related to psychopathy and SU.

In this sense, MI could be used to increase motivation to participate in other evidence-based therapies that can treat psychopathy (i.e., CBT or family therapy; Caldwell et al., 2012; White et al., 2013) while integratively targeting the aforementioned risk and responsivity factors. In regards to psychopathy, MI could directly decrease the expression of psychopathic personality features while reducing some of the behaviors associated with the more stable Factor 2 traits of the construct (i.e., SU; Kimonis et al., 2012). Such an intervention could also be attractive to the criminal justice system because of its efficiency and relatively low-cost to administer compared to other therapies.

Hypotheses

It was hypothesized that MI would be associated with improved readiness to change as outlined by the TTM and SDT after each MI session and compared to the standardized treatment (Hypothesis 1; Hall et al., 2014). Although no study has examined MI in youth with psychopathic traits, similar to other psychopathy interventions using a motivational component (Salekin, Tippey et al., 2012), it was expected that MI would predict significant increases in motivation to change SU and problematic interpersonal interactions and relative empathic deficits characteristic of psychopathy (Hypothesis 2). That is, the effectiveness of treatment to increase motivation across testing periods was expected to be dependent on the treatment participants receive.

After completion of the MI intervention, participants' self-reported psychopathic traits were hypothesized to be significantly lower than when measured pre-treatment as was found by Salekin, Tippey et al. (2012). Based on findings from other adolescent psychopathy treatment studies (i.e., Caldwell et al., 2012; White et al., 2013), it was expected that psychopathic personality traits, specifically YPI-measured CU and interpersonal traits and ICU domains, would show greater decreases than the impulsive or antisocial features (Hypothesis 3). Further, follow-up phone interviews with participants approximately 3 to 4 months after discharge from a residential program were expected to reveal that short-term psychopathy decreases immediately following treatment would remain. These longitudinal changes were also expected to be greater in youth who received MI than those not receiving MI (Hypothesis 4).

Similarly, self-reported severity and frequency of SU (including alcohol use), was predicted to be lower in adolescents who received MI than control participants, similar to other MI studies (Stein et al., 2010), and lower than SU rates reported pre-treatment (Hypothesis 5). Delinquency and aggression were expected to be lower in adolescents who received MI at follow-up compared to pre-treatment antisocial behavior and compared to youth who did not receive MI (Hypothesis 6). Youth receiving MI were also hypothesized to show significantly improved treatment engagement (Hypothesis 7), have fewer disciplinary citations post-treatment than youth not receiving MI (Hypothesis 8), and reduced self-reported police contact rates three months after program completion compared to youth only receiving standard treatment (Hypothesis 9).

Comparable to research examining motivational interventions (Salekin, Lester et al., 2012; Stein et al., 2006), it was expected that increases in motivation to change would enhance engagement in the residential treatment. That is, motivation to change SU and psychopathic features were expected to predict positive engagement and decreased negative engagement as rated by participants and program staff using the Treatment Participation Questionnaire (TPQ; Stein et al., 2004). Improved engagement and motivation to change were hypothesized to predict decreased antisocial behavior, psychopathic traits, and reduced alcohol and drug use severity and frequency at follow-up (Hypothesis 10). Further, decreased alcohol use was expected to predict reduced aggression as outlined by Boden et al. (2012; 2013; Hypothesis 11).

CHAPTER II – METHODOLOGY

Participants

Participants were 95 adolescent males (age range between 16 and 18; *M* = 16.91) sampled from a larger pool of 181 male youth at the Mississippi Youth Challenge Academy, a 22-week voluntary residential program for youth who have dropped out of school. The participants' ethnicity was primarily White (*n* = 49), followed by Black (*n* = 30) and biracial (*n* = 2); no ethnicity data were provided for 14 participants as official records were not available for these youth. Participants from the larger pool represented approximately 75% of all adolescents who were invited to participate.

Measures

Youth Psychopathic Traits Inventory (YPI; Andershed et al., 2002)

The YPI is a 50-item self-report measure of adolescent psychopathic traits composed of higher-order GM, CU, and II factors with additional facets assessing more specific psychopathic features. Only YPI total and broad factor scores were used in the proposed study. YPI scores were measured at baseline, post-treatment, and follow-up. Although most studies have cited good internal consistencies for YPI total, GM, and II scores in both community and justice-involved samples ($\alpha > .78$), the reliability of CU scores is more variable (αs between .57 and .74; Poythress et al., 2006; Seals, Sharp, Ha, & Michonski, 2012). At baseline, YPI total ($\alpha = .93$), GM ($\alpha = .87$), CU ($\alpha = .82$), and II ($\alpha = .88$) scores displayed good internal consistency in this study.

Inventory of Callous-Unemotional Traits (ICU; Frick, 2003)

The ICU is a 24-item self-report measure of adolescent CU traits, each measured using a four-point Likert scale. In addition to being used as a screening instrument, the

ICU was administered post-treatment and at follow-up. Research has identified a three-factor solution including Callousness, Uncaring, and Unemotional subscales (Pihet et al., 2015; Roose et al., 2010). Although the Unemotional factor has low internal consistency (α = .53-.63; Feilhauer et al., 2012; Kimons et al., 2008) and is not significantly correlated with the other ICU factors (Berg et al., 2013), these studies found that ICU total, Callous, and Uncaring scores display adequate reliability (α > .70). In the current study at baseline, ICU total (α = .64), Callousness (α = .63), and Unemotional (α = .28) scores displayed lower than expected internal consistency compared to scores reported by past studies, whereas Uncaring scores (α = .73) displayed good internal consistency. ICU Unemotional scores were not included in this study because of their poor reliability.

Drug Abuse Screening Test-Adolescent Version (DAST-A; Martino et al., 2000)

The DAST-A is a 28-item self-report screening measure for adolescent substance abuse and dependence. Each item is scored as either a "yes" or "no," with a higher frequency of "yes" responses indicative of a more severe SU problem. Endorsing six or more "yes" responses is associated with substance abuse or dependence as outlined by the Diagnostic and Statistical Manual of Mental Disorders (4th ed., *DSM-IV*; American Psychiatric Association, 1994). Participants rated each item based on their behavior in the six months prior to entering the residential program. The DAST-A was administered as an initial screening measure and at follow-up. According to Martino and colleagues, DAST-A total scores display strong internal consistency (α = .91), one-week test-retest reliability (r = .89), and are significantly predictive of substance dependence and abuse diagnoses. DAST-A total scores displayed good internal consistency at baseline (α = .82) and at follow-up (α = .77).

Self-Report of Delinquency (SRD; Elliot et al., 1985)

The SRD is a 34-item self-report measure designed to assess the frequency with which juveniles engage in diverse delinquent acts. Each item represents a distinct delinquent act, with respondents indicating with "yes" or "no" responses whether they have ever committed the act. Composite scores represent the frequency of "yes" responses. The SRD was administered at baseline and follow-up. Research investigating the SRD has found that total scores predict family-reported delinquency, police contacts, and court convictions (Krueger et al., 1994) and display strong internal consistency ($\alpha >$ .89) in detained samples for violent and nonviolent offenses (Kimonis et al., 2014; Marsee et al., 2011). In the current study, SRD total scores displayed good internal consistency at baseline ($\alpha = .88$) and at follow- up ($\alpha = .75$).

Peer Conflict Scale (PCS; Marsee & Frick, 2007)

The PCS is a 40-item self-report questionnaire measuring overt and relational forms of reactive and proactive aggression in adolescents. The PCS was administered at baseline and follow-up. Reactive aggression is characterized as an aggressive response to threat or provocation, whereas proactive aggression is instrumental and unprovoked (Marsee et al., 2011). This study used a total aggression composite score because of the strong overlap between reactive and proactive aggression scores in the present sample ($r = .81$, $p < .001$). Research examining high-risk adolescents has found that PCS total scores display appropriate internal consistency ($\alpha = .93$; Marsee, Lau, & Lapré, 2014). The internal consistency of PCS total scores measured at baseline ($\alpha = .93$) and at follow-up ($\alpha = .87$) were good in the current study.

Change Questionnaire (CQ; Miller & Johnson, 2008)

The CQ is a 12-item self-report measure of an individual's intrinsic motivation to change, with each item rated on a 10-point scale. This study used separate CQ forms to assess motivation to change SU and consequences related to psychopathic traits at baseline and after each MI session. Based on the client-centered MI approach, the CQ allows participants to choose the action they wish to change when responding to each item. Initial validation of the CQ identified three distinct factors related to perceptions of the importance of change, their ability to change, and commitment to change (Miller & Johnson, 2008). Although Miller and Johnson noted a potential ceiling effect (i.e., high pre-treatment CQ scores), there was still enough variability in CQ scores that increases in desire to change from pre to post-intervention were detected ($r = .79$, $p < .001$). Further, total CQ scores which were used in the current study have displayed good internal reliability ($\alpha = .86$; Miller & Johnson, 2008). Initial CQ scores for SU ($\alpha = .97$) and psychopathy-related behavior ($\alpha = .98$) were strong in this study. The consistencies of CQ total scores throughout the intervention were also good (αs between .97 and .98).

Readiness to Change Questionnaire (RCQ; Heather & Rollnick, 1993)

The RCQ is a 12-item questionnaire assessing three of the TTM stages of change (i.e., Precontemplation, Contemplation, and Action), each with four items. Each item is measured using a five-point scale. Precontemplation items were reverse-scored so that higher scores for all three subscales represented greater readiness to change. The RCQ was used as an additional measure of participant motivation to change SU at baseline and after each MI session. Comparable to findings with adult samples, adolescent research has found that the RCQ can be used to accurately classify individuals into TTM stages

based on their motivation to change and are related to longitudinal SU treatment outcomes (Bailey, Baker, Webster, & Lewin, 2004; Heather & Hönekopp, 2008; Stevens, McGeehan, & Kelleher, 2010). Stevens et al. (2010) noted that TTM stage scores displayed adequate internal reliability (αs between .60 and .84). At baseline, the internal consistency of the Precontemplation (α = .67), Contemplation (α = .75), and Action (α = .87) TTM stage scores was acceptable. The range of consistencies throughout the intervention for the Precontemplation (αs between .59 and .64), Contemplation (αs between .79 and .85), and Action (αs between .85 and .89) TTM stage scores was also acceptable.

Treatment Participation Questionnaire (TPQ; Stein et al., 2004)

The self-report TPQ (TPQ-T) is a 25-item measure of adolescent attitudes and behaviors toward engagement in individual or group treatment programs. The TPQ has also been adapted as a 15-item third-party rating measure of engagement for use by social workers or treatment leaders (TPQ-M). In the current study, TPQ measures were to be completed as applied to engagement in the residential treatment. The TPQ-T was to be completed by all adolescents, whereas the TPQ-M was to be completed by program staff blind to participant MI treatment assignment. The TPQ-T contains distinct positive and negative engagement scales, which assess attitudes and behaviors reflective of active treatment compliance and reduced noncompliance, respectively, whereas the TPQ-M only contains negative engagement items (Stein et al., 2004). Research investigating incarcerated youth has found that changes in alcohol use-related stages of change during MI treatment are predictive of improved TPQ-M and TPQ-T positive and negative engagement (Clair et al., 2011). Further, MI is predictive of decreased TPQ-T negative

engagement compared to RT control (Stein et al., 2006). No reliability coefficients have been reported in published research to examine the internal consistency of TPQ scores. Reliability statistics are unavailable for the present study because the TPQ measures were not completed by the program staff.

Institutional Behavior and Police Contact

Institutional behavior was measured as the proportion of disciplinary citations to the number of weeks that occurred before and after the start of the intervention while participants were enrolled in the residential program. Citations are based on a variety of behaviors ranging from insubordination toward staff to physical fighting/assaults. This information, as well as participant ethnicity, was obtained by official records after participants completed the program. Frequency of police contact was measured as the self-reported number of re-arrests between residential program completion and follow-up.

Procedure

Participants were screened from the larger pool based on SU and CU screening criteria. First, adolescents scoring two or higher on the Drug Abuse Screening Test-Adolescent Version (DAST-A; Martino, Grilo, & Fehon, 2000) were selected from the program population. This criterion was used so that each participant displayed some substance abuse or dependence symptoms that could be targeted during MI while not overly restricting the pool of available participants needed to achieve desired power in the study (n = 157). From this subsample, youth scoring one standard deviation below the sample mean ICU total score or higher were selected to form the study's sample (n = 95). Similar to the SU screening criterion, this criterion was used to not overly restrict the final sample size while still ensuring that each participant exhibited some CU traits

that could be targeted through intervention. CU traits rather than psychopathy as an overall construct were used as a screening criterion to avoid potential criterion contamination with SU and because CU traits were central to the purpose of this study. From this sample, 47 youth were randomly assigned to the MI-condition, and 48 were randomly assigned to the group not receiving MI. Participants in the MI and treatment as usual (TAU) groups were not significantly different in their pretreatment SU severity, CU traits, overall psychopathy, aggression, delinquency, or motivation to change SU or psychopathy-related behavior. Forty-five participants completed the follow-up over the telephone and received a $20 gift card.

During screening, all potential participants completed the ICU, YPI, DAST-A, PCS and SRD. After screening, 95 participants were randomly assigned to either the MI or TAU control group. Participants first completed a baseline assessment measuring pre-treatment motivation to change SU (CQ-SU) and psychopathy (CQ-P), as well as the RCQ to indicate their SU stage of change. Following completion of the battery, youth in the MI condition were randomly assigned to one of six groups. Each group had two clinical psychology graduate students acting as co-leaders to facilitate the intervention. Each leader attended an MI workshop consisting of didactic and role-playing components and received four, one-hour MI coaching sessions prior to the study. Coaching consisted of supervision and feedback related to video recorded MI role plays. Each MI group was audio recorded so that therapist integrity to the underlying principles of MI could be examined (this information is beyond the scope of the hypotheses for this study but will be reported and discussed in a subsequent paper).

The intervention was composed of three distinct, weekly one-hour sessions adapted from the Free Talk manual for first-time adolescent drug offenders (D'Amico, Hunter, & Osilla, 2013). The first session introduced adolescents to the expectations and nature of MI while exploring their perspectives about SU behavior, emotion, empathy, and interpersonal relationships. Leaders also started to raise doubt about the opinions of the group that may be inconsistent with prevalence base-rates (i.e., beliefs that most adolescents drink and smoke marijuana; Feldstein Ewing et al., 2013) or that are not supported by empirical literature. This task was accomplished by showing how each adolescent's reported alcohol and marijuana use and CU traits compare to averages reported in the literature with personalized feedback sheets. Consistent with the spirit of MI, leaders discussed ambivalence without disregarding the opinions or experiences of the group. The positive and negative consequences of maintaining and changing the youths' SU and emotional and interpersonal style were also discussed.

The second session explored the reasons that group members may want to change these aspects of their lives while discussing their ability and confidence to make a change. Specifically, the positive and negative consequences of making a change were reviewed in terms of participants' future plans, goals, and expectations. A change ruler (i.e., a scale from 0-10) was also used to facilitate discussion about participants' readiness to change (e.g., *how come you chose 2 and not 0; what would get you from a 3 to a 5?)* before and after discussing participants' past success in making a change. Assertive, passive, aggressive, and passive-aggressive interpersonal styles were also discussed. Role plays and group discussion were used to demonstrate the strengths of assertive communication.

The final session explored common internal and external triggers of participants' SU (e.g., feeling anxious or sad; being at a party) and alternatives that participants can choose to use when presented with, or to avoid, these triggers. Co-leaders also discussed how alcohol and drug use can lead to future difficulties and different kinds of problem-solving strategies that can be used to maintain change if desired (e.g., spending time with other friends who do not use substances; consuming mixed drinks that do not have alcohol in them). Participants practiced using different problem-solving strategies via role play and discussed potential barriers and solutions that may arise in the future with using these strategies.

Participants completed the RCQ and CQ measures after each session. Participants in the TAU group also completed these measures once a week. After the final session, participants in both conditions completed the ICU and YPI as post-treatment measures of psychopathic traits. Positive and negative engagement in the residential treatment program (i.e., TAU) was to be measured using the TPQ by program staff the week following the third MI session intervention; however, these data are unavailable as program staff did not complete and return the TPQ. Consequently, the proposed models and analyses involving treatment engagement could not be conducted and are not reported. A follow-up was conducted between three and four months after participants left the residential program. Participants completed the YPI, ICU, PCS, SRD, and DAST-A over the telephone based on their time since leaving the program. Participants provided a self-reported history of arrest since leaving/graduating from the program.

CHAPTER III - RESULTS

Participant Attrition and Group Differences

During administration of the screening battery, one participant did not complete the CQ, two participants did not complete the RCQ, two participants did not complete the YPI, five participants did not complete the SRD, and nine participants did not complete the PCS. Citation data were not available for 14 participants. These participants remained in the study; however, they were not included in analyses involving these measures. After participants completed the screening battery and were randomly assigned to the different conditions, six youth assigned to the MI-condition (12.5%) and three youth assigned to TAU (6.25%) declined to participate in the study and did not complete any of the subsequent measures or participate in the groups. These youth were not significantly different from those who participated in at least one session on pre-intervention SU severity, psychopathy, CU traits, aggression, delinquency, or motivation to change. Participants who declined to participate (M = 32.56) and who participated in one session (M = 34.20) had higher mean CU scores than those who participated in every session throughout the intervention (M = 27.29; t = 2.30, p < .028).

For the first session, 39 participants in the MI condition and 43 participants in the TAU condition attended the group and/or completed the corresponding measures (~95% of youth who did not initially decline to participate in the study). Unlike participants who declined to participate in any group (see above), the 5% of youth who did not attend this group attended at least one other session. From the MI condition, 33 participants completed session two (80% of participants who did not initially decline), whereas 40 participants completed the corresponding measures from the TAU condition (88% of

participants who did not originally decline). One participant who attended the MI group did not complete the RCQ. Thirty-two participants completed session three in the MI condition (78% of participants who did not originally decline) and 38 participants completed the measures in the control condition (84% of participants who did not initially decline); two participants in the MI group declined to complete the measures and five participants in the TAU group did not complete the YPI or ICU after the third session. Overall, 52 participants attended all three MI groups or completed the corresponding measures in the TAU condition, whereas 29 and 5 participants completed two and one MI session/data collection periods, respectively.

Chi-square analyses revealed that the likelihood of attrition was not significantly different between MI and TAU groups at any point during the intervention, χ^2 *between* .88 and 3.49, $p > .061$; however, the TAU condition was associated with significantly more overall data collection session completions than the MI condition, $r = .25$, $p = .013$. This finding suggests that the subsequent results need to be interpreted with some caution and highlights the need to report intent-to-treat analyses in addition to completer analyses. Forty-four youth completed the follow-up, 46% of the original sample ($n = 22$ for MI; $n = 22$ for TAU). Of these, one participant declined to complete the PCS, ICU, and police contact question. No significant differences were observed between youth who completed the follow-up from those who did not on any of the pre- or post-intervention measures.

Descriptive Statistics and Group Differences

Descriptive statistics for the pre-intervention data are presented in Table 1, whereas data collected during the intervention and at follow-up are presented in Table 2

and Table 3, respectively. Group differences are also reported. Seven participants reported at least one police contact since leaving the program (MI = 5; TAU = 2). Because the overall sample was split into MI and TAU groups, kurtosis and skew values larger than two standard errors were used to identify variables that were not normally distributed. All factors were normally distributed for the pre-intervention data except proactive aggression and pre-intervention citations for MI and TAU groups and total aggression, reactive aggression, and ICU Callousness scores for the MI condition. For factors measured during the intervention, all scores were normally distributed except ICU total scores for both groups and YPI CU scores for the TAU group. Proactive aggression and delinquency scores were positively skewed in both groups, whereas total aggression, reactive aggression, post-intervention citations, and alcohol and drug use severity were positively skewed in the TAU group at follow-up. In terms of group differences, the MI group reported significantly more Contemplation after each session and significantly lower YPI total and GM scores at post-intervention than the TAU group[1].

[1] No significant differences were found when cases with complete data for each measure were analyzed (i.e., no aggression differences for youth who completed the PCS at each time point).

Table 1

Descriptive Statistics for Pre-Intervention Data

	MI Group			*TAU Group*		
Scale/Subscale	*M (SD)*	*Skew*	*Kurtosis*	*M (SD)*	*Skew*	*Kurtosis*
YPI Total	116.57 (23.74)	-.38	.13	121.46 (26.09)	.21	.01
GM	30.97 (8.30)	.08	-.51	32.50 (9.61)	.46	.25
CU	35.57 (8.01)	.44	-.06	36.80 (8.91)	.12	-.49
II	39.41 (9.42)	-.43	-.47	41.37 (9.08)	.18	-.89
ICU Total	29.02 (7.41)	.38	-.25	28.88 (7.00)	.54	-.78
Callousness	6.64 (4.25)	.95	.54	7.03 (4.01)	.62	-.43
Uncaring	9.88 (4.36)	-.11	-1.15	10.07 (4.31)	-.22	-.80
Aggression Total	18.47 (15.42)	1.10	.60	22.30 (16.93)	.73	.34
Reactive	11.45 (8.27)	.80	.02	13.47 (8.81)	.06	-.71
Proactive	6.94 (7.93)	1.46	1.96	8.82 (8.92)	1.24	1.30
Delinquency	11.02 (6.43)	.20	-1.01	13.71 (6.23)	.30	-.44
Alcohol & Drug	7.45 (4.02)	.66	-.16	8.56 (5.30)	.68	-.35
Citations	6.83 (7.55)	2.16	5.74	6.21 (6.38)	1.24	1.01
CQ: SU	67.38 (36.05)	-.01	-1.32	77.28 (32.97)	-.38	-.91
CQ: Psychopathy	72.91 (35.81)	-.23	-1.07	82.53 (33.90)	-.52	-.86
Precontemplation	.63 (4.30)	-.28	-.27	.40 (3.47)	-.40	-.09
Contemplation	-.41 (4.28)	.05	-.42	-.16 (3.67)	-.03	.34
Action	.22 (4.72)	-.02	-.77	1.15 (4.60)	-.32	-.70

Note: YPI = Youth Psychopathic Traits Inventory; ICU = Inventory of Callous Unemotional Traits; GM = Grandiose Manipulative; CU= Callous Unemotional; II = Impulsive Irresponsible; CQ = Change Questionnaire; SU = Substance Use; *SD* of the skew between .35 and .38; *SD* of kurtosis = .68 and .74.

Table 2

Descriptive Statistics for Intervention Data

	MI Group			*TAU Group*		
Scale/Subscale	*M (SD)*	*Skew*	*Kurtosis*	*M (SD)*	*Skew*	*Kurtosis*
Session 1						
CQ: Substance Use	81.89 (32.36)	-.43	-.86	78.95 (33.10)	-.31	-1.17
CQ: Psychopathy	74.21 (39.09)	-.25	-1.40	76.19 (33.16)	-.41	-.86
Precontemplation	.85 (3.84)	.00	-.44	-.44 (3.47)	.13	.45
Contemplation	2.05[a] (3.87)	-.49	-.13	-.65[b] (4.62)	.05	-1.00
Action	1.64 (4.37)	-.52	-.45	.56 (4.64)	-.14	-.50
Session 2						
CQ: Substance Use	79.54 (30.58)	-.39	-.51	78.70 (30.41)	-.30	-.91
CQ: Psychopathy	76.97 (31.35)	-.37	-.68	78.48 (30.25)	-.26	-.82
Precontemplation	-.44 (3.88)	.02	-.01	-.29 (3.17)	.05	.20
Contemplation	2.25[a] (3.63)[a]	-.74	.70	-.01[b] (3.98)	-.48	-.14
Action	2.41 (4.05)	-.37	-.17	.97 (4.40)	-.44	-.48
Session 3						
CQ: Substance Use	84.96 (29.64)	-.84	.20	78.37 (34.06)	-.31	-1.26
CQ: Psychopathy	89.60 (31.87)	-.88	-.21	81.02 (33.19)	-.47	-.88
Precontemplation	.52 (3.42)	-.10	.33	-.61 (3.08)	-.80	.86
Contemplation	2.45[a] (3.56)	-.16	-.71	.42[b] (4.17)	-.29	-.17
Action	2.91 (3.07)	.06	-.35	1.05 (4.79)	-.33	-.67
YPI Total	115.28[b] (21.55)	.57	1.61	126.67[a] (21.54)	-.14	.04
GM	30.62[b] (9.98)	.54	-.46	35.52[a] (7.54)	-.09	.54
CU	36.21 (5.57)	.09	-.51	36.86 (5.44)	.16	-.42
II	38.20 (7.50)	.62	1.10	42.03 (7.93)	-.36	-.41
ICU Total	28.95 (10.71)	-1.06	1.22	28.84 (10.88)	-.62	1.88
Callousness	9.37 (5.27)	.34	.94	8.35 (5.27)	.57	-1.15
Uncaring	8.93 (4.88)	.30	.21	11.19 (4.88)	-.03	.17

Note: YPI = Youth Psychopathic Traits Inventory; ICU = Inventory of Callous Unemotional Traits; GM = Grandiose Manipulative; CU= Callous Unemotional; II = Impulsive Irresponsible; CQ = Change Questionnaire; *SD* of the skew between .36 and .47; *SD* of kurtosis = .71 and .91; means with superscripts indicate a significant difference ($\alpha < .05$; [a] = larger value, [b] = lower value); one case was identified as an outlier for the YPI CU distribution and was removed.

Table 3

Descriptive Statistics for Follow-Up Data

	MI Group			*TAU Group*		
Scale/Subscale	*M (SD)*	*Skew*	*Kurtosis*	*M (SD)*	*Skew*	*Kurtosis*
YPI Total	109.23 (25.74)	.20	-.44	103.36 (18.50)	.04	-.67
GM	38.45 (11.84)	.59	.09	35.05 (6.67)	.34	-.39
CU	34.00 (8.95)	.24	.29	32.77 (7.95)	.85	.40
II	36.77 (3.84)	.76	.10	35.55 (7.93)	.45	-.26
ICU Total	23.48 (8.21)	.23	.44	19.68 (8.95)	.35	.20
Aggression Total	13.05 (11.22)	.67	-1.07	10.50 (9.00)	1.53	2.83
Reactive	8.76 (6.89)	.19	-.164	8.00 (5.55)	.49	-.04
Proactive	3.67 (5.35)	1.36	.28	1.59 (2.61)	1.92	3.13
Delinquency	2.68 (2.46)	1.97	5.40	1.82 (1.97)	1.85	3.82
Alcohol/Drug Use	1.91 (2.35)	.82	-.72	2.14 (2.87)	1.19	.38
Citations	.67 (.87)	.95	-.34	1.18 (1.55)	1.15	.17

Note: YPI = Youth Psychopathic Traits Inventory; ICU = Inventory of Callous Unemotional Traits; GM = Grandiose Manipulative; CU= Callous Unemotional; II = Impulsive Irresponsible; CQ = Change Questionnaire; *SD* of the skew between .49 and .50; *SD* of kurtosis = .95 and .97; one reactive aggression score was identified as an outlier and was removed.

Outliers were examined for each skewed variable. Potential outliers were identified as cases with scores three standard deviations or more above the mean. Two cases were identified as outliers for pre-intervention proactive aggression scores, whereas a single unique case was identified for pre-intervention citations, post-intervention YPI CU scores, and follow-up delinquency and reactive aggression scores; no other variables contained outliers. The YPI CU and reactive aggression score distributions were normally distributed after outlier removal. The statistics presented in Tables 2 and 3 and

subsequent analyses do not contain these outliers. The other scores were not normally distributed after outlier removal. Square root and logarithmic transformations were used to normalize these remaining distributions. Because the patterns of the subsequent results did not change when transformed data were used for these variables, the original distributions were used to aid in interpreting the findings and are included in Tables 1-3.

Motivation to Change

To examine Hypothesis 1 that MI would be associated with improved readiness to change SU based on the stage of change model, three mixed-factor ANOVAs were conducted, one for each stage of change measured by the RCQ. The between subjects factor was group (MI and TAU), and the within subjects factor was time (four-time points of measurement; see Table 4). Family-wise error was controlled using a Bonferroni correction ($\alpha_{pc} = .017$). The assumption of sphericity was violated for each ANOVA for the completer and intent-to-treat samples as indicated by Mauchly's test, $\chi^2(5)$ *between* 16.06 and 53.21, $p \leq .007$; therefore, Greenhouse-Geisser estimates of sphericity were used to correct the degrees of freedom, εs *between* .76 and .84. For those who completed the RCQ measures at each time point, there was a significant main effect of time for Contemplation. Contrasts revealed that mean pre-intervention Contemplation scores were significantly lower than mean Contemplation scores measured after the second session, $F(1, 53) = 15.94$, $p < .001$, and final session, $F(1, 53) = 11.61$, $p = .001$. No other main effects or interactions were significant with the completer sample.

Intent-to-treat analyses were also conducted by carrying the last RCQ score forward for participants who dropped out during the intervention. In addition to significant main effects of time, significant time-group interactions were found for

Contemplation and Action, as predicted. To investigate the nature of the interactions, mean Contemplation and Action differences across time was investigated. Analyses of the simple effects revealed a significant effect of time on Contemplation, $F(2.22, 100.01) = 11.95$, $p < .001$, and Action, $F(2.20, 98.92) = 9.10$, $p < .001$, in the MI condition, but not in the TAU condition. Pairwise comparisons revealed that for participants in the MI group, mean Contemplation and Action scores were higher at each follow-up session compared to pre-intervention. Like the simple effects, no mean Action or Contemplation differences were significant across time in the TAU condition (see Figure 1).

Table 4

ANOVA Statistics for RCQ Stages of Change Data

	Completer Analysis			*Intent-to-Treat Analysis*		
	F	*df*	*Partial* η^2	*F*	*Df*	*Partial* η^2
Precontemplation						
Group	.77	1, 53	.01	.13	1, 91	.00
Time	2.25	2.52, 133.69	.04	.60	2.37, 215.21	.01
Time x Group	.74	2.52, 133.69	.01	.49	2.37, 215.21	.01
Contemplation						
Group	1.02	1, 53	.02	7.03*	1, 91	.07
Time	5.59*	2.54, 134.77	.10	7.34**	2.41, 219.56	.08
Time x Group	2.53	2.54, 134.77	.05	6.20**	2.41, 219.56	.06
Action						
Group	.00	1, 53	.00	2.05	1, 91	.02
Time	2.70	2.39, 126.45	.05	4.04*	2.28, 207.48	.04
Time x Group	2.78	2.39, 126.45	.05	6.25**	2.28, 207.48	.06

Note: * $p < .017$, ** $p \leq .001$.

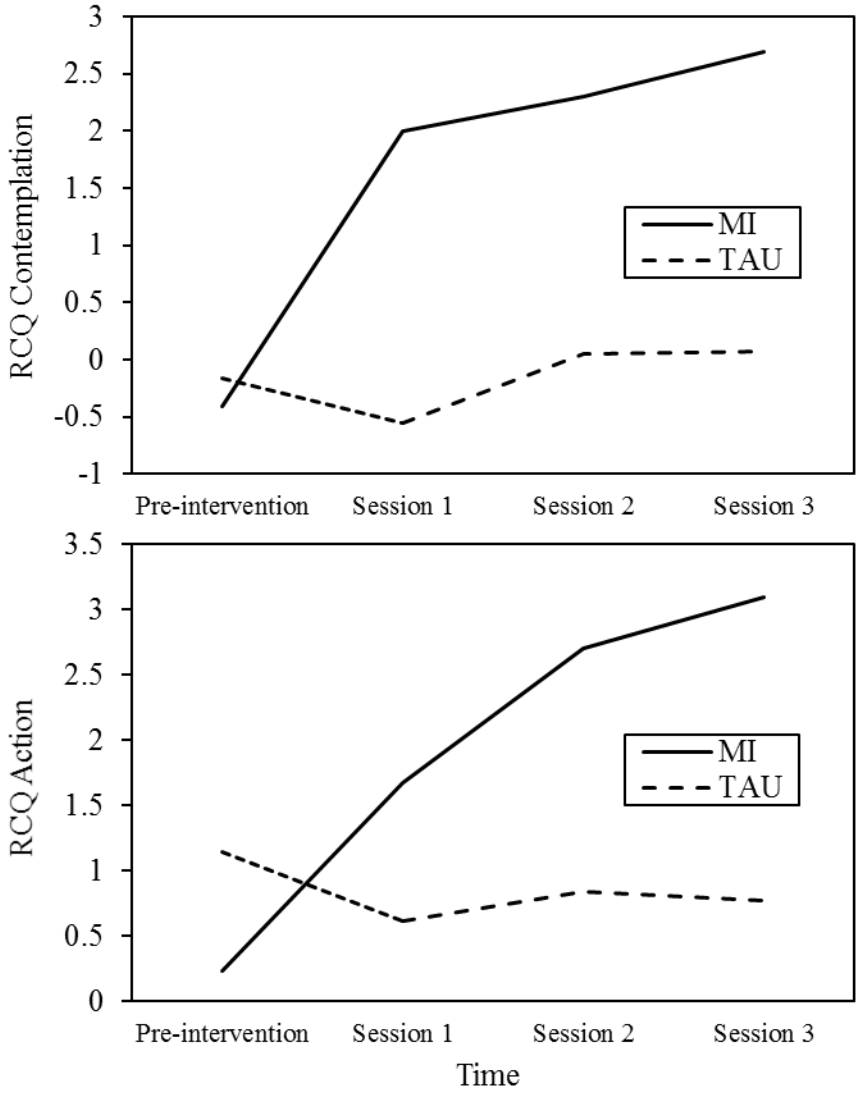

Figure 1. Simple effect of time on Contemplation (above) and Action (below)

Note: Simple effect is shown for both MI and TAU groups in the intent-to-treat sample.

To examine Hypothesis 2 that MI is related to improved motivation to change SU and problematic interpersonal interactions and relative empathic deficits characteristic of psychopathy, a 2 x 4 mixed factors MANOVA was conducted, with time (four measurement periods) and intervention group (MI or TAU) as the independent variables, and CQ-SU and CQ-psychopathy as the dependent variables. A MANOVA was chosen rather than two ANOVAs because the dependent variables were strongly correlated at

each time point, *rs* between .52 and .88, $p < .001$. For the completer analyses, the assumption that within-group covariance matrices are equal was not supported, *Box's M* = 93.14, $p < .001$. Thus, Pillai-Bartlett's trace was used to report the multivariate results. For those who completed each measure at each time point, there was no significant difference between MI and TAU groups on motivation to change SU and psychopathy-related behaviors, $F(2, 54) = .06$, $p = .94$, *partial* $\eta^2 = .00$, $V = .00$. Similarly, the effect of time, $F(6, 50) = 1.50$, $p = .20$, *partial* $\eta^2 = .15$, $V = .15$, and the interaction between group and time, $F(6, 50) = .53$, $p = .78$, *partial* $\eta^2 = .06$, $V = .06$, were not significant.

Intent-to-treat analyses were conducted in an analogous manner as the RCQ data and revealed somewhat different results. Specifically, a significant main effect of time was found, $F(6, 87) = 2.96$, $p = .011$, *partial* $\eta^2 = .17$, $V = .17$; however, there was no significant difference between MI and TAU groups, $F(2, 91) = .74$, $p = .48$, *partial* $\eta^2 = .02$, $V = .02$, or a significant interaction between time and group, $F(6, 87) = 1.16$, $p = .34$, *partial* $\eta^2 = .07$, $V = .08$. Univariate follow-up tests revealed a significant main effect of time only for motivation to change SU, $F(1.96, 180.02) = 3.36$, $p = .038$, *partial* $\eta^2 = .04$, and a significant time-group interaction was found for motivation to change SU, $F(1.96, 180.02) = 3.42$, $p = .036$, *partial* $\eta^2 = .04$. Analyses of the simple effects found a significant effect of time, $F(1.59, 72.91) = 5.92$, $p = .007$, in the MI condition, but not the TAU condition, as hypothesized. Pairwise comparisons revealed that for participants in the MI group, mean motivation to change SU scores were higher at post-intervention compared to pre-intervention (see Figure 2).

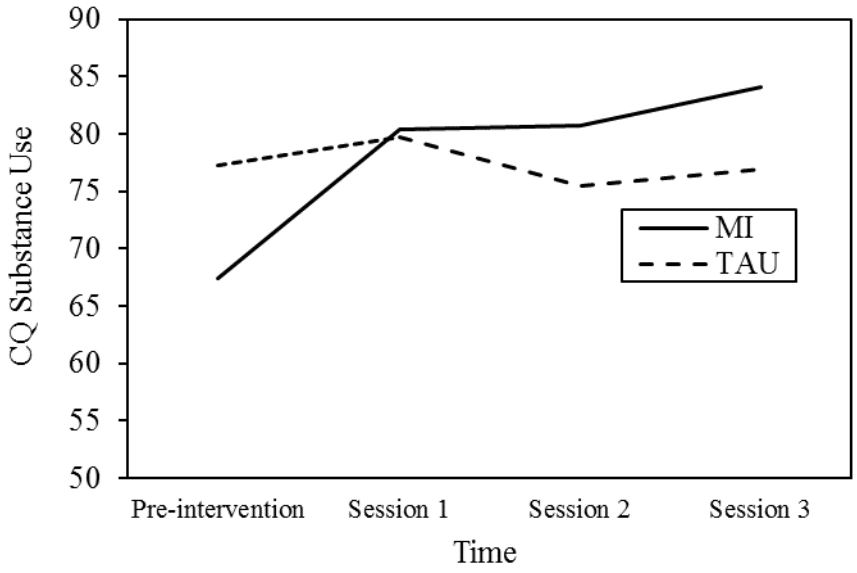

Figure 2. Simple effect of time on motivation to change substance use

Note: Data presented are for the intent-to-treat sample.

To examine motivational changes during the intervention independent of the number of sessions completed, net change scores were calculated between each participant's pre-intervention CQ score and his/her last recorded CQ score. One case was more than three standard deviations above the mean net motivation to change psychopathy-related behavior score and was removed. Independent *t*-tests were used to compare mean differences in net change scores between groups. Results revealed that the MI group, $M = 12.13$, $SD = 40.05$, had significantly greater increases in motivation to change psychopathy-related behaviors, $t(83) = 2.11$, $p = .038$, $d = .46$, than the control group, $M = -4.52$, $SD = 32.64$. The MI group, $M = 18.15$, $SD = 42.01$, also had significantly greater increases in motivation to change SU, $t(84) = 2.35$, $p = .021$, $d = .50$, than the TAU group, $M = -.87$, $SD = 33.00$.

Psychopathy

To examine Hypotheses 3 and 4 that MI would be related to reduced psychopathic traits at post-intervention and at follow-up compared to TAU, particularly interpersonal and CU traits, two 2 x 3 mixed-factor ANOVAs and two 2 x 3 mixed-factor MANOVAs were conducted. In each test, time (three measurement periods) and intervention group (MI or TAU) were entered as the independent variables. Total YPI and ICU scores were entered as the dependent variable in each of the ANOVAs, whereas the individual factors of each scale were entered as dependent variables in each MANOVA. MANOVAs were used because within each measurement time point, YPI factor scores, *rs between* .44 and .68, $p < .001$, were strongly correlated and ICU Callousness and Uncaring scores were significantly associated, *rs between* .26 and .43, $p < .05$. Family-wise error was controlled using a Bonferroni correction for each set of tests ($\alpha_{pc} = .025$). Results of the ANOVAs are displayed in Table 5; results of the MANOVAs are in Table 6.

For the YPI analyses, the assumption of sphericity was met for the completer sample, $\chi^2(2) = 2.33$, $p = .31$, whereas the assumption was violated for the intent-to-treat sample, $\chi^2(2) = 16.58$, $p < .001$. Greenhouse-Geisser estimates of sphericity were used to correct the degrees of freedom for the intent-to-treat sample, $\varepsilon = .86$. For those who completed the YPI at each time point, there was a significant main effect of time before error correction. However, contrasts revealed no significant differences between YPI scores at any measurement period. Consistent with this finding, no main effects or interactions were significant with the intent-to-treat sample. For the ICU analyses, the assumption of sphericity was met for the completer sample, $\chi^2(2) = .34$, $p = .85$, but was violated for the intent-to-treat sample, $\chi^2(2) = 13.95$, $p = .001$, $\varepsilon = .88$. A significant main

effect of time was observed in the completer and intent-to-treat samples. Contrasts revealed that that mean pre-intervention ICU total scores were significantly higher than mean ICU scores measured during follow-up for the completer, $F(1, 28) = 25.07$, $p < .001$, and intent-to-treat sample, $F(1, 93) = 8.58$, $p = .004$, but not at post-intervention for either sample. The effect of time was not dependent on the intervention received, as was hypothesized.

Table 5

ANOVA Statistics for YPI and ICU Total Scores

	Completer Analysis			*Intent-to-Treat Analysis*		
	F	*df*	*Partial* η^2	*F*	*df*	*Partial* η^2
YPI Total						
Group	.47	1, 28	.02	3.03	1, 91	.03
Time	3.17*	2, 56	.10	2.75	1.71, 155.79	.03
Time x Group	1.36	2, 56	.05	.93	1.71, 155.79	.01
ICU Total						
Group	1.09	1, 28	.04	.04	1, 93	.00
Time	19.89**	2, 56	.42	10.86**	1.75, 163.06	.11
Time x Group	1.71	2, 56	.06	.88	1.75, 163.06	.01

Note: YPI = Youth Psychopathic Traits Inventory; ICU = Inventory of Callous Unemotional Traits.

* $p \leq .050$, ** $p < .025$.

For the analyses examining the individual YPI and ICU factors, the assumption that within-group covariance matrices are equal was supported for each test, *Box's M* between 18.69 and 69.31, $p \geq .05$. Therefore, Wilks' Lambda is used to report the multivariate results (see Table 6). Based on the completer and intent-to-treat samples, there were significant effects of time for both the YPI and ICU factors; however, there

was no significant difference between MI and TAU groups or interaction between time and intervention group, as was predicted.

Table 6

MANOVA Statistics for YPI and ICU Factor Scores

	Completer Analysis			*Intent-to-Treat Analysis*		
	F (Λ)	*Df*	*Partial η^2*	*F (Λ)*	*df*	*Partial η^2*
YPI Factors						
Group	.60 (.94)	3, 26	.07	.93 (.97)	3, 89	.03
Time	7.49* (.34)	6, 23	.66	7.19* (.67)	6, 86	.33
Time x Group	1.37 (.74)	6, 23	.26	.74 (.95)	6, 86	.05
ICU Factors						
Group	.91 (.93)	2, 27	.06	1.04 (.98)	2, 92	.02
Time	13.02* (.32)	4, 25	.68	10.52* (.68)	4, 90	.32
Time x Group	.82 (.88)	4, 25	.12	2.03 (.92)	4, 90	.08

Note: YPI = Youth Psychopathic Traits Inventory; ICU = Inventory of Callous Unemotional Traits; *Λ= Wilks' Lambda.*

* $p \leq .025$.

Univariate analyses were used to examine the nature of the significant effects of time for each of the YPI and ICU factors. For the YPI, only a significant effect of time on GM traits was found for both the completer, $F(2, 56) = 4.36$, $p = .017$, and intent-to-treat samples, $F(2, 182) = 7.73$, $p = .001$. Contrary to the hypothesis, contrasts revealed that GM scores were higher at follow-up than at pre-intervention for both samples, *Fs* between = 8.59 and 12.15, $p \leq .007$. For the ICU, a significant effect of time on Uncaring traits was found for the completer sample, $F(2, 56) = 18.29$, $p < .001$, and intent-to-treat samples, $F(2, 186) = 16.85$, $p = .001$; however, a significant effect of time on Callous traits was also found in the intent-to-treat sample. Specifically, Uncaring

traits decreased from pre-intervention to follow-up, *Fs* between = 20.52 and 37.49, $p <$ .001, whereas Callous traits increased from pre-intervention to post-intervention, $F(1, 93) = 7.69$, $p = .007$, and follow-up, $F(1, 93) = 8.13$, $p = .005$, in the intent-to treat sample[2].

Substance Use, Aggression, Delinquency, Citations, and Police Contact

Four 2x2 mixed-factor ANOVAS were used to examine whether MI is related to lower SU severity (Hypothesis 5) and aggression and delinquency (Hypothesis 6) at follow-up compared to TAU, and whether groups differ in their proportion of citations at post-intervention (Hypothesis 8). Time (pre-intervention and follow-up/post-intervention) was entered as the within-subjects factor and group (MI and TAU) was entered as the between-subjects factor (see Table 7). Family-wise error was controlled using a Bonferroni correction ($\alpha_{pc} = .013$).

Although a significant effect of time on SU severity was found for both completer and intent-to-treat samples, there was no significant difference between MI and TAU groups and the effect of time was not dependent on group, as was hypothesized. Specifically, SU severity decreased from pre-intervention to follow-up (see Tables 1 and 3 for means). To examine whether there were differences between groups at follow-up in their frequency of alcohol and marijuana use and rate of abstinence from each substance, independent samples *t*-tests and *Chi-square* tests were used, respectively, with the completer sample. MI and TAU groups were not significantly different in their frequency of alcohol use, $t(42) = 1.01$, $p = .32$, $d = .30$, and marijuana use, $t(42) = .47$, $p = .64$, $d = .14$. Moreover, the likelihood of using alcohol, $\chi^2 = 1.57$, $p = .21$, or

[2] Due to attrition between post-intervention and the follow-up, the aforementioned ANOVAs and MANOVAs were conducted with participants who completed the pre and post-intervention measures. The same pattern of results was found as those with follow-up data.

marijuana, $\chi^2 = .52$, $p = .47$, at any point during the follow-up period was not significantly different between MI and TAU groups. Participants did not report using any other substances at follow-up.

Table 7

ANOVA Statistics for Substance Use, Aggression, Delinquency, and Citations

	Completer Analysis			*Intent-to-Treat Analysis*		
	F	*Df*	*Partial* η^2	*F*	*df*	*Partial* η^2
Substance Use						
Group	.73	1, 42	.02	1.11	1, 93	.01
Time	60.17**	1, 42	.59	34.73**	1, 93	.27
Time x Group	.32	1, 42	.01	.14	1, 93	.00
Aggression						
Group	1.29	1, 38	.03	.15	1, 84	.00
Time	11.06**	1, 38	.23	9.32**	1, 84	.10
Time x Group	4.47*	1, 38	.11	3.78	1, 84	.04
Delinquency						
Group	.08	1, 40	.00	4.31*	1, 88	.05
Time	128.25**	1, 40	.76	48.40**	1, 88	.36
Time x Group	.28	1, 40	.01	.03	1, 88	.00
Citations						
Group	.03	1, 79	.00	--	--	--
Time	44.65**	1, 79	.36	--	--	--
Time x Group	1.18	1, 79	.02	--	--	--

Note: * $p < .050$, ** $p < .013$.

Although overall aggression decreased significantly in the completer and intent-to-treat samples, the effect of time was dependent on the intervention participants

received in the completer sample before error correction. However, contrary to the hypothesis, analysis of the simple effects revealed that aggression decreased from pre-intervention to follow-up for participants in the TAU group, $F(1, 19) = 9.65$, $p = .006$, but not in the MI group, $F(1, 19) = 1.57$, $p = .23$ (see Figure 3).

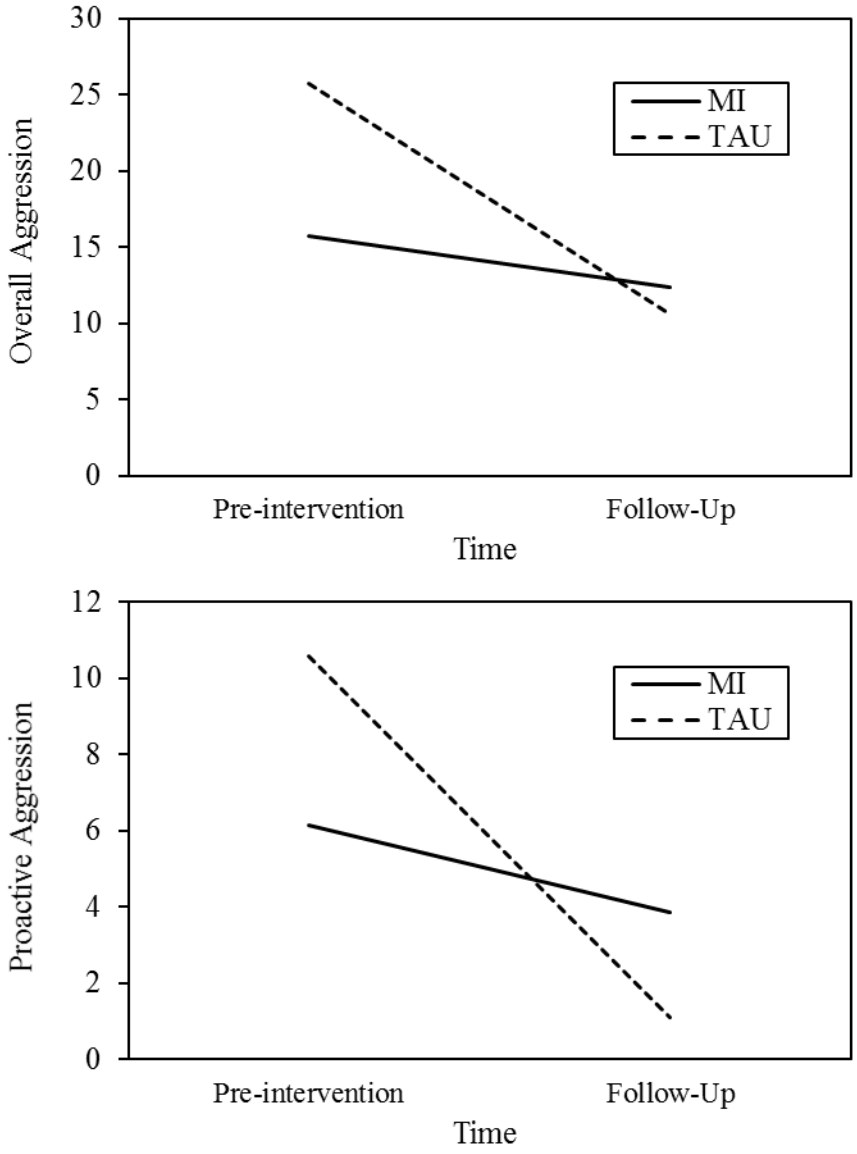

Figure 3. Simple effect of time on a) overall aggression and b) proactive aggression

Note: Data presented are for the completer sample.

To examine the effect of MI on specific types of aggression, a 2x2 mixed-factors MANOVA was conducted, with reactive and proactive aggression entered as the dependent variables. Because the assumption of equal within-group covariance matrices was not supported, *Box's M* =48.26, $p < .001$, Pillai's trace is reported. Comparable to the overall aggression findings for the completer sample, a significant effect of time was found, $F(2, 36) = 8.41$, $p = .001$, $V = .32$, and the time x group interaction approached significance, $F(2, 36) = 3.09$, $p = .058$, $V = .15$. In the intent-to-treat sample, only a significant effect of time was observed, $F(2, 83) = 5.69$, $p = .005$, $V = .12$. In addition to significant effects of time for reactive and proactive aggression in both samples, *Fs* between 6.35 and 16.98, $p \leq .014$, univariate follow-up tests revealed that the effect of time on proactive aggression was dependent on the intervention participants received for those who completed the follow-up, $F(2, 37) = 6.31$, $p = .016$. As with overall aggression, proactive aggression decreased from pre-intervention to follow-up for participants in the TAU group, $F(1, 18) = 12.94$, $p = .002$, but not in the MI group, $F(1, 18) = 1.86$, $p = .18$ (see Figure 3).

A significant effect of time on delinquency was found for the completer and intent-to-treat samples, such that delinquency decreased from pre-intervention to follow-up. However, this effect was not stronger in the MI condition than TAU, as was predicted. In terms of citations, a significant effect of time was found such that the proportion of citations received was lower during the period of time following the intervention than before the intervention commenced. Contrary to Hypothesis 8, this effect was not dependent on intervention condition. To examine Hypothesis 9 that MI would be associated with a reduced likelihood of police contact at follow-up compared to

TAU, a *Chi-square* test was used. Police contact was operationalized as a dichotomous variable (yes/no) because of the low variability in the frequency of reported police contacts (between zero and five reported contacts). The likelihood of police contact was not significantly different between MI and TAU groups, $\chi^2 = 1.71$, $p = .19$.

Integrative Motivation, Psychopathy, and Externalizing Behavior Model

Invariance testing was used to determine whether the prediction of psychopathic traits, antisocial behavior, and SU at follow-up from post-intervention motivation to change is different for MI and TAU groups (Hypotheses 10). Treatment participation was not included in the model as was specified in the original hypothesis because these data were not collected (see Methods). As displayed in Figure 4, a latent post-intervention motivation to change variable with CQ-measured motivation to change SU and psychopathy-related behavior as indicators predicted latent psychopathy (individual YPI and ICU factor indicators), antisocial behavior (aggression and delinquency indicators), and SU (SU severity, dichotomous alcohol, and marijuana use indicators) variables. Testing revealed that the original unconstrained model, $\chi^2(96) = 216.3$, was not significantly better fitting than the more parsimonious equal loading model in which all exogenous paths were constrained to be equal, $\chi^2(108) = 235.5$. This finding suggests that the specified model is not different between MI and TAU groups, contrary to the hypothesis. Moreover, the model was found to display a poor overall fit, *RMSEA* = .22, *TLI* = .36, *CFI* = .54.

Research has suggested that SEM with multiple latent variables require larger sample sizes (i.e., 120 or more participants; Wolf, Harrington, Clark, & Miller, 2013), whereas the current model only had 29 complete cases. Thus, SEM may not be the best

technique to use to analyze the associations between motivation to change, SU, psychopathy, and other externalizing behavior in the current sample. Rather than using SEM, individual analyses at post-intervention and follow-up were used to retain as much of the original sample as possible and improve power.

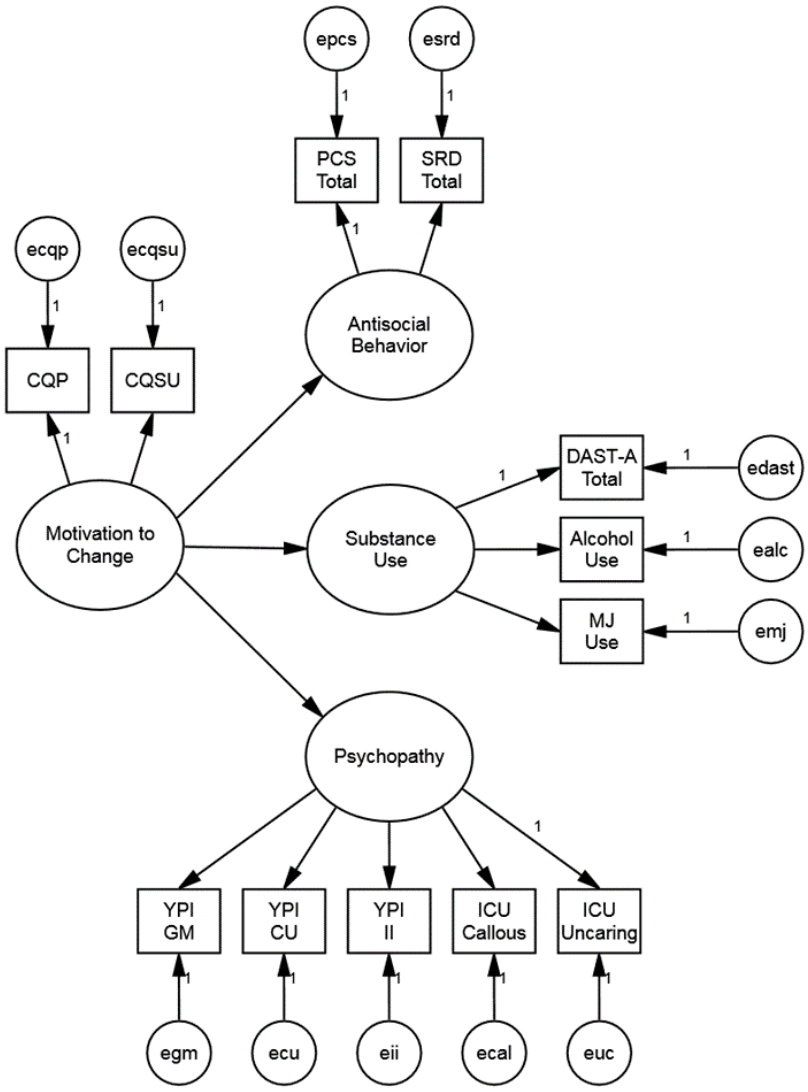

Figure 4. Integrative motivation, psychopathy, and antisocial behavior model

Note: Model predicting psychopathy, substance use, and antisocial behavior at follow-up from post-intervention motivation to change. Error terms for each latent variable measured at follow-up were removed to aid in the clarity of the model. This model was tested for MI and TAU groups separately via invariance testing.

To examine whether net increases in motivation to change psychopathy-related behavior were associated with lower reported psychopathic traits at post-intervention and follow-up, a series of zero-order correlations were calculated. In the overall sample, net motivation to change score increases were related to lower YPI GM scores, $r(58) = -.36$, $p = .005$. The relation was significant for participants in the MI condition, $r(28) = -.45$, $p = .012$, but not in the TAU condition, $r(28) = -.10$, $p = .585$. *Fisher r to z* transformations revealed that the magnitude of the relation for the MI group was not significantly greater than the TAU group, $z = 1.42$, $p = .156$. No other correlations between motivation and the YPI and ICU factors at post-intervention were significant, *rs* between -.22 and .05, $p \geq .09$. Similarly, net increases in motivation to change were not associated with psychopathy at follow-up, *rs* between -.22 and .05, $p \geq .09$.

A similar set of analyses were conducted using net motivation to change SU scores and each of the RCQ stages of change measured at post-intervention. A nonsignificant trend was observed such that SU severity decreased as participants reported increasing motivation to change as conceptualized by the stages of change model. That is, SU severity was positively related to Precontemplation, $r(31) = .28$, $p = .11$, and inversely related Contemplation, $r(31) = -.12$, $p = .50$, and Action, $r(31) = -.30$, $p = .08$. Follow-up SU severity was not significantly related to net CQ SU change scores, $r(41) = -.10$, $p = .53$.

Table 8

Prediction of Aggression, Delinquency, and Follow-Up Psychopathy

	Aggression		*Delinquency*		*Follow-Up YPI*	
Predictor	*B*	*SE*	*B*	*SE*	*B*	*SE*
Step 1	R^2 = .024		R^2 = .050		R^2 = .100	
YPI Total	.06	.06	.01	.01	.22	.12
Motivation	.00	.05	.01	.01	-.16	.10
Step 2	R^2 *change* = .133**		R^2 *change* = .025		R^2 *change* = .125***	
YPI Total	.08	.00	.01	.01	.29*	.12
Motivation	.52**	.22	.06	.05	.95*	.45
YPI x Motivation	.00**	.00	.00	.00	-.01***	.00

Note: YPI = Youth Psychopathic Traits Inventory.

* $p < .050$; ** $p < .020$; *** $p < .017$.

The potential moderating impact of motivation to change on the relation between psychopathy and future displays of antisocial behavior was also investigated. In each regression, pre-intervention psychopathy was entered as the predictor, and net motivation to change psychopathy-related behavior was entered as the moderator. Overall aggression, delinquency, and follow-up total psychopathy were the dependent variables of the three tests ($\alpha_{pc} = .017$). As displayed in Table 8, a significant interaction between pre-intervention psychopathy and motivation to change psychopathy-related behavior was found after error correction for the prediction of follow-up psychopathy. The interaction was such that pre-intervention psychopathy predicted follow-up psychopathy when motivation to change was low (i.e., one standard deviation below the mean), B = .58, SE = .18, p = .003, but not when it was high (i.e., one standard deviation above the mean), B = -.05, SE = .16, p = .739. Similarly, an interaction in the prediction of

aggression also approached significance after error correction, B = .00, SE = .00, p = .019, such that psychopathy was only associated with follow-up aggression when motivation to change was low, B = .22, SE = .09, p = .016. Figure 5 displays the nature of these interactions.

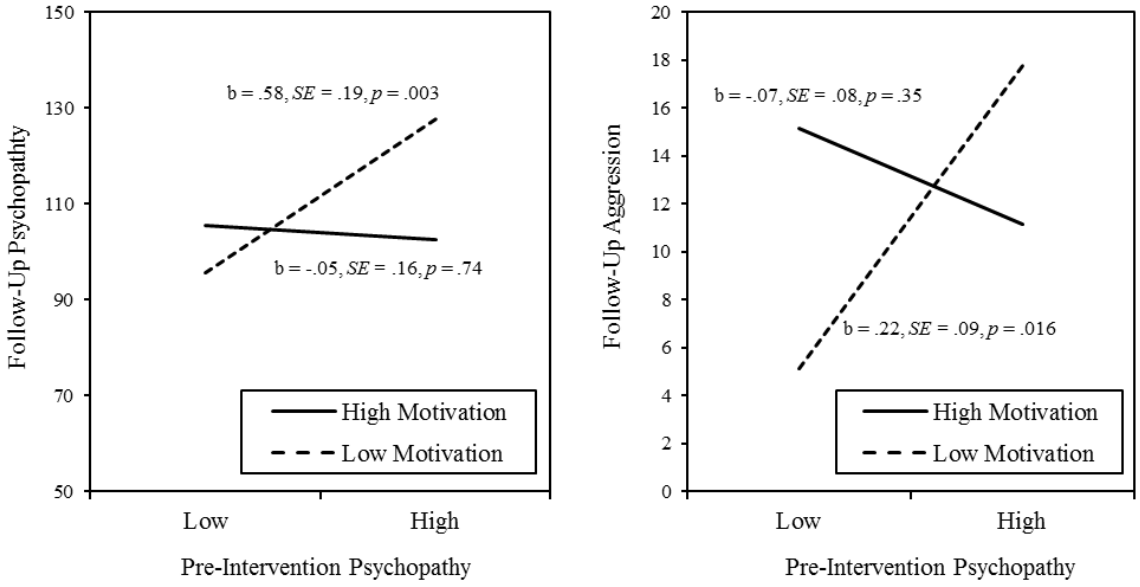

Figure 5. Interactions between pre-intervention psychopathy and net motivation to change in the prediction of follow-up psychopathy (left) and aggression (right)

To examine Hypothesis 11 that reduced alcohol use at follow-up would be related to reduced reactive aggression, an independent samples *t*-test was used to compare participants who stopped using alcohol after graduation from the residential program on net reactive aggression score to those who continued drinking after the residential program. Results indicated that stopping drinking was not associated with reduced reactive aggression compared to those who continued to drink, $t(31) = .05$, $p = .96$. Moreover, alcohol frequency at follow-up was not related to changes in reactive aggression, $r = .22$, $p = .17$.

CHAPTER IV – DISCUSSION

The current study examined the effectiveness of a brief, group-based MI intervention in reducing SU problems and psychopathic traits and their associated antisocial behaviors in a sample of at-risk adolescents. Thus, this study represents the first known investigation of the effectiveness of MI as a psychopathy intervention and whether a motivational group intervention can target shared risk (i.e., aggression, delinquency) and responsivity (e.g., motivation to change) factors related to psychopathy and SU. Although there were some positive findings with respect to these research goals, the overall results from the current study do not support the broad conclusion that MI outperformed the standard residential treatment on most of the key variables measured in this study.

Attrition and Group Differences

Compared to other interventions designed for youth with psychopathic traits, such as high-intensity CBT and Functional Family Therapy (FFT; e.g., Caldwell et al., 2012; White et al., 2013), one of the primary strengths of group-based MI protocols is their relative cost-effectiveness, clinical utility, and potential to improve retention given their brief design (e.g., D'Amico et al., 2013; Stein et al., 2006). However, in the current study, only 54% of participants in the MI and TAU groups completed each of the group sessions or corresponding measures. Comparatively, other treatments have reported total attrition rates ranging from 0% to 23% (Caldwell et al., 2006; White et al., 2013), despite being longer in duration and more intensive than the MI program. This difference is likely due to the voluntary nature of the current study (i.e., participants could drop out of the intervention without consequence), whereas previous interventions were delivered in

court-mandated and inpatient treatment environments where there are more consequences for dropping out. Nevertheless, the brief design of the MI protocol did not appear to substantially increase the reach and transportability of the intervention as was expected by theory and past MI research.

Of particular concern was that participants who completed all three MI sessions or the corresponding measurement periods in the control condition had significantly lower CU traits than those who dropped out or only participated in a single session. Thus, a voluntary MI protocol may have difficulty retaining the types of youth for whom the program is explicitly designed. However, this finding does not negate the observation that the majority of youth expressing psychopathic traits and SU problems participated in a voluntary intervention program, which is especially promising considering that these adolescents often display reduced treatment participation and engagement (Falkenbach et al., 2003; Stein et al., 2013). To address attrition in the current study, interpretation of the results is focused on examining intent-to-treat analyses (Gupta, 2011) and change score data.

Motivation to Change

The proposed mechanism by which MI is believed to facilitate behavior change is by increasing intrinsic motivation to change (i.e., Hall et al., 2014). The current study examined this possibility by evaluating different conceptualizations of readiness to change across two risk factors for juvenile delinquency: SU and psychopathic traits (Mulder et al., 2012; Nijhof et al., 2011; Salekin et al., 2010). Specifically, it was hypothesized that MI would be associated with increased motivation to change SU as indicated by the TTM and SDT (Hypothesis 1) and motivation to change psychopathy-

related behavior as identified by SDT (Hypothesis 1 and Hypothesis 2) across MI sessions and compared to TAU. The results partially support these hypotheses.

Consistent with previous adolescent MI research (Erol & Erdogan, 2008; Hall et al., 2014), youth in the MI program displayed increased awareness of the benefits associated with changing their SU (Contemplation) and reported taking more steps towards changing their SU (Action) across the intervention, whereas youth in the TAU group did not. This change is noteworthy, as progress toward more action-oriented stages away from Precontemplation (i.e., no intention of making a change) is associated with improved awareness of the problems connected with antisocial behavior, intrinsic motivation to change, and treatment improvement (Breda & Heflinger, 2004; Willoughby et al., 2003). Similarly, net increases in motivation to change SU and psychopathy-related behavior consistent with SDT were also noted.

Although the evidence in support of MI improving motivation to change psychopathy-related behavior was mixed (i.e., limited to net change scores), overall, these findings suggest that a brief, group-based MI program can facilitate motivation to change in high-risk adolescents with SU problems and psychopathic traits. As a responsivity factor related to treatment engagement and completion (Abrams, 2012; DiClemente et al., 2008), the ability to enhance motivation via MI presents a potentially attractive and cost-effective option to improve treatment amenability for adolescent SU and potentially psychopathy. Such an approach may also be helpful for agencies where restricted budgets and large client caseloads often intrude on implementing evidence-based treatment solutions (i.e., forensic and community mental health centers; Bond et al., 2014). Given that motivation gains within the MI group appeared to occur at any

point during the intervention and that many youth display poor long-term engagement in SU treatment (Clair et al., 2011; Melnick et al., 1997; Wisdom et al., 2011), MI may be especially well-suited for youth in these settings where early termination or dropout are common.

Several explanations may account for the mixed findings with respect to motivation to change psychopathy-related behavior. First, power and sample size may have been too low to detect a true, but small, effect with the MANOVA. This problem may have been compounded by the attrition noted throughout the intervention. Given that the moderate between-subjects effect size observed with net motivation to change data was similar to effect sizes reported in other psychopathy-motivation treatment studies (Salekin, Tippey, & Allan, 2012), design limitations may at least partially account for some of the null findings. Second, the brief three-session design of the current MI protocol may not have been long or focused enough for participants to contemplate making a change. For instance, the mental models psychopathy treatment examined by Salekin, Tippy, and Allan (2012) included a 12-session, psychopathy-specific motivational program. Although increasing the length of the MI protocol could reduce its transportability, it is possible that motivation to change would have increased relative to control had the adapted Free Talk manual included additional opportunities for youth to increase their change talk (i.e., reasons for changing their behavior) or for co-leaders to selectively reinforce change talk (D'Amico et al., 2015; Osilla et al., 2015).

In the future, there may be a benefit of including elements of other effective psychopathy interventions (e.g., Salekin, Lester et al., 2012; Salekin, Tippey et al., 2012), such as discussions of the importance of developing positive emotions and interpersonal

effectiveness, while maintaining the structure and nonjudgmental approach of the current protocol. Such an approach may help provide the intervention with more psychopathy-specific content from which change talk can be evoked and reflected, as well as potentially improve retention. Although some adaptations may be needed, there was initial evidence that MI may be an appropriate intervention to target a shared responsivity factor for youth with co-occurring SU problems and psychopathic traits. However, the current program was not particularly effective in its ability to reduce problematic personality traits and behaviors related to motivation to change compared to TAU.

Psychopathic Traits, Substance Use, and Antisocial Behavior

One of the primary aims of this study was to examine the effectiveness of MI in reducing the expression of psychopathic traits at post-intervention and after a four-month follow-up (Hypothesis 3), especially the interpersonal and affective deficits characteristic of the construct (Hypothesis 4). These hypotheses were not supported, suggesting that the MI protocol used in the present study did not appear to affect the longitudinal expression of psychopathic traits, as was expected and as was found for other motivation-based psychopathy interventions (Salekin, Lester, & Sellers, 2012; Salekin, Tippey, & Allen, 2012).

Although mixed findings regarding the effectiveness of MI to increase motivation to change psychopathy-related behavior (see above) may account for these null findings, these explanations do not account for why interpersonal and callous traits increased and uncaring traits decreased from pre-intervention to follow-up, whereas other CU traits remained relatively stable. One possibility for these findings is the differential temporal stability of psychopathic traits during mid to late adolescence. For instance, most

research has found that behavioral characteristics of psychopathy are the most stable throughout adolescence into adulthood (Lynam et al., 2007; Neumann et al., 2011), whereas psychopathic personality traits, especially CU traits, display more plasticity over time (Lee et al., 2009; Lynam et al., 2009; Pardini & Loeber, 2008). Although the findings from the current study generally match this pattern, the changes in psychopathic traits noted in the present study were over a four-month period, whereas the instability found in many of the aforementioned studies occurred over a number of years. Thus, it is less likely that these changes are due to longitudinal change and may be due to measurement error or low test-re-test reliability.

The present study also investigated whether MI was associated with reduced SU problems (Hypothesis 5) and a range of other longitudinal outcomes associated with psychopathy and SU, including aggression and delinquency (Hypothesis 6), disciplinary citations during the residential program (Hypothesis 8), and police contacts during the follow-up (Hypothesis 9). Third, the current study examined whether increases in motivation to change predicted changes in these outcomes to a greater degree for youth in the MI condition than the TAU group (Hypothesis 10) and whether decreases in alcohol use corresponded to decreases in aggression (Hypothesis 11). Each hypothesis was not supported. Specifically, youth reported less SU, aggression, delinquency, and citations following time in the residential program; however, this effect was not attributable to MI. Thus, the residential treatment program may be effective in reducing short-term risk factors and antisocial behavior, but MI did not add any incremental therapeutic effect in this reduction.

Because psychopathy is a risk factor for a range of problematic behavior, including aggression and offending (Byrd et al., 2013; Khan et al., 2012; Nijhof et al., 2011), it is possible that had participants in the MI group reported greater increases in motivation to change psychopathy-related behavior, they may have expressed fewer psychopathic traits and engaged in less subsequent antisocial behavior at the end of the study. However, motivation to change cannot completely account for all the null findings. Instead, sampling bias and floor effects with reported antisocial behavior may have contributed to some of the limited significant group differences at follow-up. Specifically, some of the participants who could not be reached for the follow-up may have engaged in more antisocial behavior after leaving the residential program and thus were more difficult to contact. This potential confound may account for the why both groups reported almost no SU problems, police contacts, or delinquency after leaving the program, limiting the variability needed to detect mean group differences (Field, 2013).

Nevertheless, floor effects do not appear to explain the findings regarding follow-up aggression, as both groups reported engaging in varied aggressive behaviors after leaving the residential program. Another possibility beyond those mentioned above is that MI may effectively reduce problematic behavior compared to the residential treatment only when observed over a longer period of time than was measured in the current study. Although four months may be an appropriate time-frame to detect group differences with SU (e.g., D'Amico et al., 2013; 2015; Stein et al., 2011), high-risk young offenders are at particular risk to recidivate within six and 12 months of living in the community (Ozkan, 2016). Thus, in a non-forensic, residential sample that may have even higher offending survival rates compared to forensic samples (Mulvey et al., 2004),

differences in aggressive behavior between youth in the TAU and MI groups may only become apparent over a longer follow-up period.

Independent of methodological considerations, the adapted MI protocol may also have contributed to the null findings. First, the adapted Free Talk manual may not have assisted youth in translating their motivation into taking specific, concrete steps to facilitate change after leaving the residential program. As discussed by Hall and colleagues (2014), this latter aspect of motivation is crucial in fostering behavioral change. Although youth reported increased Action toward changing their SU, it is possible that youth were not effectively learning ways to generalize the strategies and skills they were developing outside the residential program. Unlike the original Free Talk Manual, discussions of addiction and the brain did not occur, and less time was devoted to role plays and discussions concerning interpersonal, problem-solving, and behavioral strategies that adolescents can use to maintain behavioral change. In the pursuit to create a more streamlined protocol, valuable material responsible for therapeutic gain may have been removed (D'Amico et al., 2013; 2015). Thus, the current streamlined MI protocol may also work well when delivered as an enhancement intervention to increase participation in other treatments targeting SU and psychopathic traits, such as CBT and FFT (Belur, Dennis, Ives, Vincent, & Muck, 2014; Caldwell et al., 2012; White et al., 2013).

Lastly, because MI fidelity data were not reported in the current study, it cannot be determined whether the intervention that was delivered was MI. Although the MI training model used in the current study (i.e., workshop and coaching sessions) adhered to the basic principles of MI, this training did not strictly adhere to the evidence-based

guidelines for establishing MI proficiency in trainees (i.e., supervision based on standardized assessment of trainees' use of MI-consistent skills; see Madson, Schumacher, Baer, & Martino, 2016). Therefore, many of our null findings may be because MI co-leaders did not deliver the intervention in a manner that promotes change or adheres to the essential tenants of MI (i.e., showing empathy, respecting autonomy, collaborating with participants while respecting their opinions about change, and providing proper selective reflection of change talk; Moyers, Martin, Manuel, Miller, & Ernst, 2010). Given the null findings, the inability to assess for MI competency and fidelity represents a central limitation of the current study and may explain why MI did not outperform TAU on many key variables in the study. Future research examining the recorded MI audio files will help determine whether the MI co-leaders adhered to the principles of MI and the extent to which fidelity may account for the null findings.

Motivation as a Responsivity Factor

Although MI did not outperform the standard residential treatment on decreasing a variety of behaviors of interest to the juvenile justice system, data from the current study support previous research findings that motivation to change is a salient responsivity factor for adolescents with SU problems and psychopathic traits (Gillen, 2013; Melnick, et al., 1997; Salekin et al., 2010). Specifically, the current study provides further evidence that motivation can be manipulated to reduce certain risk outcomes associated with psychopathy, namely aggression. This finding indicates that improving motivation can buffer against certain types of offending that are associated with psychopathy and underscores the need for continued research to identify effective interventions targeting this responsivity factor.

Nevertheless, caution is needed with interpreting these findings, as improvement cannot be specifically attributable to MI. Moreover, improving motivation to change did not affect other antisocial behaviors associated with psychopathy, such as delinquency (Corrado, McCuish, Hart, & DeLisi, 2015), and increasing motivation to change SU as defined by the TTM or SDT did not protect against future SU problems compared to those whose motivation did not improve. As discussed earlier, motivation to change independent of additional skill development may not help reduce all forms of problematic behavior.

Limitations and Future Directions

The present findings need to be contextualized within several limitations. A central limitation was the attrition throughout the course of the intervention and follow-up and the resultant small sample size and low statistical power. Because many of the pre-planned tests could only be conducted with cases for which all data were available, many youths were excluded from analyses even if data were missing for one of the measurement periods. For the pre-planned treatment effects model, only 29 complete cases were available, whereas 120 or more participants are often needed to run SEM models with multiple latent variables (see Wolf et al., 2013). With such low power, only very large effect sizes could be detected, limiting the study's ability to detect potentially small to moderate intervention group differences (Field, 2013).

Although an objective measure of behavioral problems was used at post-intervention, (i.e., institutional citations), all other measures used in the current study were self-report. A more nuanced representation of adolescent behavior may have been observed had a multi-measure, multi-rater design been used (De Los Reyes et al., 2015).

For example, assessment of parent reports of aggression and delinquency, official recidivism records, and alcohol and drug urine screens at follow-up may have helped provide greater variability in the data needed to find significant intervention group differences. Clinician measures of treatment engagement, participation, and clinical progress also could have provided good benchmarks from which to assess whether MI could be used as an effective enhancement intervention while providing behavioral indicators of motivation to change. Staff ratings of treatment engagement are also important given the hypothesized link between motivation to change and program compliance in reducing longitudinal behavior problems (Stein et al., 2006). Nevertheless, self-report measures of psychopathy and SU are well-validated for adolescent research (e.g., Ansel, Barry, Gillen, & Herrington, 2015; Marsee et al., 2014; Martino et al., 2000, Seals et al., 2012) and were justified to use in the present study given its preliminary design.

In addition to addressing these limitations, future research should examine whether specific adaptations to the current MI protocol can improve participant retention and reduce the expression of psychopathic traits, SU problems, and other antisocial behavior. For instance, adding an adjunctive individual MI component to the intervention may help with tailoring the program to the unique needs of each individual while maintaining the benefits provided by group facilitation (e.g., cost-effectiveness; Feldstein Ewing et al., 2013). Future research should also examine whether a MI group program that has more psychopathy-specific discussion can increase motivation to change psychopathy-related behavior while helping to develop specific skills that youth need to make and maintain change. As the evidence for MI improves, future research

would be wise to examine its efficacy and effectiveness under various levels of control with different populations of youth across varying settings, such as forensic treatment centers and inpatient units. Treatment dismantling studies examining potential mechanisms of action (i.e., evocation of change talk; Houck et al., 2015; Osilla et al., 2015) may also be useful in identifying specific components of the intervention that best affect positive change from components that are less salient.

The overall null findings should not discourage researchers from continuing to investigate motivational interventions for these adolescents despite the long road of research that lies ahead. Early evidence that a brief, three-session group program can improve a shared responsivity factor in a traditionally underserved population is encouraging and suggests that with adaptations, MI may become an integral intervention approach with this group of youths.

APPENDIX A – IRB Approval Letter

THE UNIVERSITY OF
SOUTHERN MISSISSIPPI

INSTITUTIONAL REVIEW BOARD
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NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months.
  Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: CH14090204
PROJECT TITLE: The Effectiveness of Motivational Interviewing with At-Risk Adolescents
PROJECT TYPE: Change to a Previously Approved Project
RESEARCHER(S): Christopher Gillen, Christopher Barry and Rebecca Kauten
COLLEGE/DIVISION: College of Education and Psychology
DEPARTMENT: Psychology
FUNDING AGENCY/SPONSOR: Aubrey K Lucas & Ella G Lucas Endowment for Faculty Excellence/DE01632
IRB COMMITTEE ACTION: Expedited Review Approval
PERIOD OF APPROVAL: 09/16/2014 to 09/15/2015

Lawrence A. Hosman, Ph.D.
Institutional Review Board

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