

2015

How Motivational Interviewing Affects the Motivation, Self-Efficacy, and Outcome Expectancies of Adjudicated Adolescents in a School Setting

Sarah Paret Rabkin

Follow this and additional works at: <https://dsc.duq.edu/etd>

Recommended Citation

Paret Rabkin, S. (2015). How Motivational Interviewing Affects the Motivation, Self-Efficacy, and Outcome Expectancies of Adjudicated Adolescents in a School Setting (Doctoral dissertation, Duquesne University). Retrieved from <https://dsc.duq.edu/etd/1016>

This Immediate Access is brought to you for free and open access by Duquesne Scholarship Collection. It has been accepted for inclusion in Electronic Theses and Dissertations by an authorized administrator of Duquesne Scholarship Collection. For more information, please contact phillips@duq.edu.

HOW MOTIVATIONAL INTERVIEWING AFFECTS
THE MOTIVATION, SELF-EFFICACY, AND OUTCOME EXPECTANCIES
OF ADJUDICATED ADOLESCENTS IN A SCHOOL SETTING

A Dissertation

Submitted to the Department of Counseling, Psychology, and Special Education

School of Education

Duquesne University

In partial fulfillment of the requirements for
the degree of Doctor of Philosophy

By

Sarah Paret Rabkin

December 2015

DUQUESNE UNIVERSITY
SCHOOL OF EDUCATION
Department of Counseling, Psychology, and Special Education

Dissertation

Submitted in partial fulfillment of the requirements
for the degree
Doctor of Philosophy (Ph.D.)

School Psychology Doctoral Program

Presented by:

Sarah Paret Rabkin
M.S. Ed. Child Psychology, Duquesne University, 2008
B.S. Psychology, John Carroll University, 2007

July 27, 2015

HOW MOTIVATIONAL INTERVIEWING AFFECTS
THE MOTIVATION, SELF-EFFICACY, AND OUTCOME EXPECTANCIES
OF ADJUDICATED ADOLESCENTS IN A SCHOOL SETTING

Approved by:

_____, Chair
Tammy L. Hughes, Ph.D.
Fr. Martin A. Hehir Endowed Chair for Scholarly Excellence
Professor/Chair
Department of Counseling, Psychology, and Special Education
Duquesne University

_____, Member
Jeffrey A. Miller, Ph.D., ABPP
Professor and Associate Provost/
Associate Academic Vice President
Duquesne University

_____, Member
Elizabeth McCallum, Ph.D.
Associate Professor
Department of Counseling, Psychology, and Special Education
Duquesne University

ABSTRACT

HOW MOTIVATIONAL INTERVIEWING AFFECTS THE MOTIVATION, SELF-EFFICACY, AND OUTCOME EXPECTANCIES OF ADJUDICATED ADOLESCENTS IN A SCHOOL SETTING

By

Sarah Paret Rabkin

December 2015

Dissertation supervised by Tammy L. Hughes, Ph.D.

Unfortunately, substance use is prevalent among adolescents. Data from the National Institute on Drug Abuse (NIDA) shows that in 2009, 46.7% of 12th grade students reported that they had tried an illicit substance in their lifetime (NIDA, 2010). Substance use in adolescence is the strongest predictor of drug and alcohol disorders in adults. Albert Bandura's social cognitive theory suggests there is a reciprocal interaction between personal, environmental, and behavioral factors that contribute to substance use. This theory is also useful for identifying factors (e.g. motivation, self-efficacy, and outcome expectancies) that are central to behavior change.

Motivational Interviewing (MI) is an evidence-based intervention that directly addresses factors useful for behavioral change. For adolescents using drugs and alcohol, MI has been identified as an evidence-based intervention (Barnett, et. al., 2012; Jensen,

et. al., 2011). The current study examined the impact of the intervention, MI, on the social cognitive theory factors of motivation, self-efficacy, and outcome expectancies in adolescents who have been through the juvenile court system. The intervention was conducted in a charter school for adjudicated adolescents. To assess the specific impact of the intervention, a single subject design was utilized.

The results suggest that the intervention positively affects the factors that contribute to behavior change as indicated by an increase in motivation to avoid substance use, an increase in self-efficacy to refuse substances, a decrease in positive outcome expectancies related to using substances, and an increase in the positive expectancies related to avoiding substance use. This study provides support for the use of MI in a specific population of adolescents who would benefit from a substance use intervention.

DEDICATION

To my parents Dana and Wendy, and parents in law Mike and Beth Rabkin – thank you for all of your love, support, and guidance throughout the dissertation process.

To my husband Barry - thank you for encouraging me and lending me the strength to persevere through every challenge with determination.

To my aunt Ellen – You never let me get distracted or lose my focus. You are both my co-pilot and my champion.

To all of my friends and family – the faith that you placed in me made all the difference. Words cannot express the gratitude I feel for your unconditional support. This dissertation is dedicated to you all, with special thanks to my recently departed Uncle Tom, whose love of science and people was, and will always be, my inspiration.

ACKNOWLEDGEMENT

To my dissertation Chair, Dr. Hughes – thank you for your guidance and mentoring throughout this process. You have always gone the extra mile for me and shown me how much you cared. I will spend the rest of my career trying to repay to others, the generous contributions of time, expertise, and mentorship, which you have shared with me.

And to my committee, Dr. Miller and Dr. McCallum, who made this dissertation possible – you do so much for our school, and our field, it's amazing that you still found time to guide and support me personally. Duquesne is lucky to have you and so am I.

To Dr. Greene Minett at the academy, you took me under your wing, and made what could have been a stressful process, a genuine pleasure. You smoothed every bump along the way, and were always in my corner. If I could choose anyone in the world to run this study with, I would choose you.

I am so lucky and grateful to have had the opportunity work with each of you. Thank you all from the bottom of my heart, you'll never know how much your support and mentorship meant to me.

TABLE OF CONTENTS

	Page
Abstract	iv
Dedication	vi
Acknowledgement	vii
List of Figures	ix
List of Abbreviations	x
Chapter I: Introduction	1
Chapter II: Literature Review	15
Chapter III: Methods	61
Chapter IV: Results	82
Chapter V: Discussion	98
References	110

LIST OF FIGURES

	Page
Figure 1: Antecedents of Adolescent Substance Abuse	21
Figure 2: Efficacy Expectations and Outcome Expectations.....	26
Figure 3: Dimensions of Outcome Expectancies.....	29
Figure 4: Processes of Change	41
Figure 5: Four Elements of Motivational Interviewing	44
Figure 6: Motivation Scores Across Phases for all Participants	86
Figure 7: Self-Efficacy Scores Across Phases for all Participants	90
Figure 8: Positive Avoidance Expectancy Scores Across Phases for All Participants.....	94
Figure 9: Positive Use Expectancy Scores Across Phases for all Participants	97

LIST OF ABBREVIATIONS

Motivational Interviewing (MI)

National Institute on Drug Abuse (NIDA)

Substance Abuse and Mental Health Services Administration (SAMHSA)

Cognitive Behavioral Therapy (CBT)

Drug Use Resistance Self-Efficacy Scale (DURSE)

Drug Refusal Scale (DRS)

Cognitive Appraisal of Risky Events Scale – Revised (CARE-R)

Motivational Interviewing Treatment Integrity Scale (MITI)

Chapter I: Introduction

General Description

The national survey by the Substance Abuse and Mental Health Services Administration (SAMHSA) showed that 10% of adolescents aged 12-17 reported using illicit substances at least once in the past month (SAMHSA, 2009). The 2009 rate of use is up from the 9.3% reported in 2008. Also, in 2009 the National Institute on Drug Abuse (NIDA) indicated that 46.7% of 12th graders used at least one illicit drug in their lifetime. In other words, approximately half of older American adolescents have used substances. For these 12th graders the prevalence of alcohol use was reported as 66.2% and some 2.5% reported that they drank every day (NIDA, 2010). The NIDA survey described the prevalence for marijuana use as steady over the past five years where 11.8% of 8th graders, 26.7% of 10th graders, and 32.8% of 12th graders indicate Marijuana use (NIDA, 2010).

Problems Associated with Adolescent Substance Use

In addition to substance use, fatalities associated with this use are important to consider. For example, the National Vital Statistics System Mortality File reports that fatal drug poisonings for youth aged 15-24 years has increased five-fold from 1999-2006 (Centers for Disease Control and Prevention [CDC], 2010). Although drug fatalities are primarily attributed to a rise in inhalant and prescription drug use, all substance use in adolescents is associated with a number of other adverse experiences including impaired academic achievement, criminal behavior, suicide, psychological comorbidity, car crashes, aggression, and sexually risky behaviors (Deas & Thomas, 2002). Drug and alcohol use in adolescence is the greatest predictor of substance abuse disorders in

adulthood (SAMHSA, 2009; Deas & Thomas, 2002; CDC, 2010; Chassin, Ritter, Trim, & King, 2003). Thus it is important to consider the onset or etiology of use in adolescence.

There are many theories regarding the etiology of substance use in adolescence. Simple genetic risk or exposure to substances via contact with the social environment fails to explain who becomes a substance user, or substance addict. Rather, drug and/or alcohol use develops from a complex set of risks and experiences (Chassin, Ritter, Trim, & King, 2003). Scheier (2010) argues that Bandura's social cognitive theory best explains factors that combine to explain drug use.

Social Cognitive Theory

Social cognitive theory first considered the onset of substance use (i.e., etiology) in the 1940's. Subsequently, the theory has been expanded to address why an individual continues to use drugs and can become an addict despite the negative consequences of his or her behavior. Bandura's (1977, 1982, 1986, 1997) social cognitive theory postulated that the actions and mental processes of humans are influenced by behavior, personality, and environmental events; he called this 'triadic reciprocity' or 'reciprocal determinism.' Specifically, it is the interaction of these three factors (also called determinants) that explain human functioning, particularly mental processes. For Bandura, behavioral determinants are any and all actions that a human makes. Environmental determinants are the external (e.g., social variables) contexts that interact with humans. In addition, personal determinants are the cognitive processes that go on within the mind. Differentiating these distinct contributions proved to be critical not only for explaining how individuals come to use drugs but also for developing treatment

strategies; therapies that focus on personal determinants while also taking into account the external forces that result in actions. Most often, personal determinants (e.g., motivation, self-efficacy, and outcome expectancies) are used to explain the onset of drug use.

Bandura points out that mental processes and capabilities are not explained fully by the basic behavioral stimulus-response model. The stimulus-response model posits that if a stimulus x is present it will be followed by response y. Rather, Bandura emphasized human complexities such as: a) the human capacity to think abstractly, and how that influences the repertoires through which problem solving occurs within the mind and without any physical prompts, b) there is an ability to understand information via abstract representations, highlighting the use of numbers to perform computations, and the use of letters to read, c) the capability of forethought where humans -- unlike most other mammals-- have the ability to plan their actions in advance of carrying them out, d) vicarious learning, where humans can learn by watching others and are not simply limited by their own idiosyncratic experiences, and e) the ability to self-reflect and self-regulate behavioral choices. The interaction of these capabilities within these three types of determinants (i.e. behavior, personal, and environment), comprise the groundwork for social cognitive theory and established a model for human functioning.

Examined through this framework, substance use is best explained by the personal determinants of Bandura's model. Specifically, personal motivations such as self-efficacy, and outcome expectancy are used to explain the etiology, maintenance, relapse, and cessation of substance use (Bandura, 1977; Dijkstra, Conijn, & De Vries, 2006;

Marlatt, Baer, & Quigley, 1995; Niaura, 2000). Below, each of these determinants are linked to substance use.

Motivation, Self-Efficacy, and Outcome Expectancies

Motivation, when explained in the context of substance use, was originally seen as a social motivation. For those who used drugs, the theory was that they were motivated vicariously by watching others in their social group use substances where there were positive advantages with little costs (Bandura, 1977). Over the years, as the research developed and the focus shifted to treating addiction rather than explaining it, the relationship between motivation and substance became more complex and now includes the more specific motivation to stop using, also called the ‘readiness’ to stop using (DiClemente, Schlundt, & Gemmell, 2003). Social cognitive theory denotes that motivation is a central factor in behavior change, thus it is important to the change in substance use behavior. To have motivation, one must believe that their change goal is accomplishable. Believing that a personal goal is accomplishable is called self-efficacy (Bandura, 1977). Similarly, having the efficacy expectation that one can stop using is the “cornerstone” of motivation. (Naiura, 2000).

Self-efficacy is the level of confidence in one’s ability to perform a behavior. Consider the following example of the power of self-efficacy: if you do not believe you can fly, you will not willingly attempt it. One can have a sense of general self-efficacy (e.g. I believe I can accomplish what I want to). However, one can have self-efficacy related to specific actions (e.g. I believe I can finish this paper). Oei, Hasking, and Philips (2007) have argued that specific feelings of self-efficacy are more reflective of actual

behaviors. In other words, by measuring specific beliefs of self-efficacy, predictions can be made about what behaviors might occur because of that self-efficacy belief.

The current study focuses on the specific self-efficacy belief of being able to resist substance use. In social cognitive theory, although learning can be completed through many channels, the issue of forethought becomes an essential ingredient. Through forethought and the ability to symbolically consider resisting substances an individual's self-efficacy can be impacted (e.g., I feel that I will be able to refuse alcohol at the next party). Likewise, having lower self-efficacy to resist will also negatively affect the motivation to stop using drugs or alcohol (I will not be able to refuse alcohol). Another important part of motivation that Bandura points out is an individual's expectation of what will occur when he or she acts. The perceived or desired outcome of an action will be influenced by the confidence to complete it. In other words, self-efficacy is influenced by an individual's expectation of the outcome of the action. The outcome expectation is referred to as 'outcome expectancy.'

Outcome expectations are often explained in an 'if-then' framework. For example, an adolescent may believe "If I smoke this joint, then I will be accepted by this social group." The corresponding self-efficacy belief is the level of confidence to produce this outcome, "I am confident that I can smoke this joint, and be accepted in the group." Outcome expectations heighten motivation and make it more likely that the action (e.g., of smoking the joint) will occur. Outcome expectancies that are undesirable can also play a role in motivation. If the adolescent perceives that smoking cigarettes leads to cancer, the desire to use will decrease. This outcome expectancy coupled with the self-efficacy to

resist smoking cigarettes has been implicated in the cessation of smoking (Van Zundert, Nijhof, & Engels, 2009).

Bandura identified these factors as being important components of behavior change. If an individual is motivated or ready to change, has the self-efficacy belief that he or she can change, and believes that the outcome of that change will be beneficial, it is more likely that the change will occur. The next section will focus on the empirical evidence that a positive change in these factors is predictive of a positive change in substance use behavior.

Empirical Support for Social Cognitive Determinants

Motivation. In empirical studies, the determinants within social cognitive theory have been used to both predict and clarify the variables that need to be strengthened in order to treat addiction. Motivation is more often explored as a factor that begins drug use (Glantz, 2010). It is less often explored as a factor that leads to decreasing or cessation of substance use. Motivations to stop using are also most relevant to the development of treatments. Enhancing motivation to change has led to decreased use or abstinence from substances (Miller & Rolnick, 2002). Motivation to begin treatment has also been implicated as a predictor for post-treatment success; however, the motivation or readiness to change behavior was a slightly stronger predictor of treatment success (De Leon & Jainchill, 1986).

In a sample of rural felony probationers, Duvall, Oser, and Lukefield (2008), used 'motivation to change' as a predictor for relapse. Specifically, their 'readiness to change' score was a significant predictor ($p = >.01$) of subsequent drug related behaviors during their time on probation. A higher score on the 'readiness to change' measure (indicating

that the participant endorsed more intentions to change) predicted less drug related behaviors at a 3-month follow-up. These findings show that motivation for changing drug related behaviors is strongly associated with fewer drug related behaviors.

Among adult residents in a sober living house motivation to change was examined in a longitudinal study (Korcha et. al., 2011). Motivation to change was measured in six-month intervals until 18 months from baseline. Higher scores on the readiness to change measure (higher scores equaling more readiness) were predictive of less alcohol problems at eight and 16 months. Participants with lower scores on the readiness to change measure had predictably more problems.

Motivation to change, or readiness to change has also been implicated in successful outcomes for adolescents. In a clinical sample of adolescents receiving substance treatment, a higher readiness to change significantly predicted more days of abstinence from alcohol (Maisto, et. al., 2011). They concluded that participants' reported 'readiness to change' was predictive of abstinence at both six and 12 month follow-up.

Taken together, there is a pattern that suggests the motivation or readiness for change is associated with actual change outcomes. Further, interventions that are structured to increase motivation to change are likely to have an affect on the outcomes of adolescents (Miller, 1985). Finally, substance difficulties are responsive to interventions that focus on readiness for changes (Prochaska, Diclemente, and Norcross, 1992).

Self-efficacy. Self-efficacy is the confidence that an individual has in their ability to be efficacious. This social cognitive factor in behavior change has also been implicated as a predictor of substance use outcomes (Miller, Westerberg, Harris, & Tonigan, 1996). General self-efficacy, (e.g. I have the ability to accomplish what I want to accomplish) as compared to specific self-efficacy beliefs (e.g. I can refuse alcohol if I want to refuse alcohol) have accounted for different types of outcomes. Oei, Hasking, and Philips (2007) note that specific self-efficacy beliefs are more predicative of specific behavior than general self-efficacy.

Refusal self-efficacy was documented in a smoking cessation study where 612 adults were attempting to quit smoking tobacco (Cupertino et. al., 2011). The investigators noted that higher than average refusal self-efficacy at baseline was predictive of higher refusal self-efficacy at six months, and quitting at the 12 month follow up. They noted that self-efficacy to refuse in this population is particularly important due to the social and habitual nature of a tobacco addiction.

Ehret, Ghaidarov, and LaBrie (2013) evaluated the predictive validity of refusal self-efficacy on heavy drinking among adolescent college students. They found evidence that having more refusal self-efficacy was associated with less drinking and fewer drinking related consequences. The researchers also measured positive behavioral strategies (or coping skills) and the relationship between coping skills, self-efficacy, and drinking. They noted that their results revealed that self-efficacy has a moderating impact on the relationship between coping skills and alcohol use. This means that even if the participant had less coping skills, having a higher refusal self-efficacy score would make the individual less likely to binge drink.

Outcome Expectancies. When an individual uses their forethought ability to imagine what will occur as a consequence to an action this is defined as an ‘outcome expectancy.’ Negative outcome expectancies (e.g. if I use heroin, my family will leave me) have been associated with the reduction of drug use (Katz, Fromme, & D’Amico, 2000; McNally & Palfai, 2001).

In a study that sought to confirm that positive expectancies were also positively related to deviance, drug use, and risky sexual behaviors, Katz, Fromme, and D’Amico (2000) evaluated the results from 129 undergraduate students. They noted that outcome expectancies were independently significantly associated with subsequent behavior meaning that if the participant had negative expectancies about drug use, they were less likely to use, similarly, if he or she had positive expectancies, he or she was more likely to use.

McNally and Palfai (2001) looked at how outcome expectancies impacted the motivation to change among adolescent college students and binge drinking behavior. The participants included 152 freshmen (mean age = 18) who were asked to fill out surveys about alcohol use, motivation to change alcohol use and expectancies about alcohol use. They found that having more negative expectancies was associated with a high motivation to change binge-drinking behavior. The amount of positive expectancies about binge drinking was not found to be significantly predictive of having less motivation to change.

Significance of Problem

The social cognitive theory constructs of motivation, self-efficacy, and outcome expectancy are shown to be related to substance use in etiology, maintenance, reduction, and cessation. However, there are few interventions that directly address these constructs in youth (Miller & Rollnick, 2002). Examining changes in youth is critically important because this group of substance users account for a majority of adult users. Further, this group proves to be the most difficult to treat when initial treatments are initiated as an adult because their drug use is now a long standing condition that is accompanied by both negative and positive feelings (Chassin, Ritter, Trim, & King, 2003). Indeed, it is the long-standing nature of mixed outcomes that complicates more straightforward assumptions and motivations. An intervention that has been seen to be effective in creating positive outcomes for adolescents who use substances is Motivational Interviewing (MI). This intervention incorporates the constructs that social cognitive theory linked to successful behavior change.

General Theoretical Basis of Motivational Interviewing

Adolescent substance users are difficult to treat due to their developmental position (discussed in chapter 2), and lack of real world experience (giving them self-efficacy beliefs and outcome expectancies that may not reflect actual events). Also, given the realities of adolescent drug and alcohol use, these factors (e.g. motivation self-efficacy, and outcome expectancy) should be considered for planning drug and alcohol interventions; the brief intervention, MI, uses these factors. In explanation, there are four principle strategies used in MI (Arkowitz & Westra, 2009) that can help plan for

decreasing drug use during adolescents. Taken in order, these four strategies are meant specifically to enhance motivation to change.

Motivational interviewing strategies. The first is ‘expressing empathy’ to understand the client’s perspective without judgment or criticism. This strategy is humanistic in nature. Then the next strategy is to ‘develop discrepancy’ between the clients goals and the impact of his or her drug use. The counselor points out discrepancies between the client’s values and their behaviors, such as being a role model to a little brother and smoking crack cocaine are discrepant. These discrepancies remind the client of negative expectancies of substance use, thus increasing negative expectancies important for behavior change.

The third strategy is to ‘roll with resistance’ when the client expresses anger, unwillingness to change, or ambivalence. Resistance is considered an expected part of change. The counselor will learn more about a client from his or her resistance. For example, when an adolescent is in therapy for drug use, it is usually not by choice. This adolescent will likely be resistant to a suggestion of a change in his or her drug use behavior. In MI, ‘rolling with resistance’ means the counselor does not argue or try to contradict their client.

The fourth strategy is to ‘support self-efficacy’ in the client. This strategy will enhance and encourage successful change in the client, as per Bandura’s theory that to be motivated one must also believe he or she is efficacious. The counselor will support all positive change goals that the client puts forth.

Empirical evidence for motivational interviewing and mechanisms. Currently, much of the research on MI as an intervention for substance difficulties is with adults, adolescents have been studied far less. In a systematic review of 29 empirical studies, motivational interviewing was found to be an efficacious intervention for people with substance problems (Dunn, Deroo, & Rivara, 2001). Of these 29 studies, three used a sample of adolescents.

MI has been linked to an increase in motivation or readiness to change (Naar-King, et. al., 2010). In a study that used a sample of youth with human immunodeficiency virus (HIV), MI was found to significantly increase motivation to change risky behavior as compared to a control group (Naar-King, et. al., 2010). However, the intervention did not have a significant impact on self-efficacy. Note, the self-efficacy measured in this study was the general self-efficacy construct of being able to avoid tempting situations, rather than a specific self-efficacy task of refusing unprotected sex.

Colby and colleagues (2012) measured motivation to quit cigarette smoking among adolescents receiving a MI intervention. They found that motivation to quit did not increase significantly when compared to a control group. However, in another study that used a motivational interviewing intervention to address adolescent smoking, Brown and colleagues (2003) found that self-efficacy to abstain from smoking was significantly increased after the intervention as compared to those in the brief advice condition.

The literature about how MI impacts outcome expectancies is very limited. However, because a major goal of MI is to develop discrepancy it is anticipated that the intervention should increase in negative outcome expectancies. Thush and colleagues (2009) measured the impact of MI on outcome expectancies in adolescents at-risk for

alcohol problems. In a 2x2 analysis they found that motivational interviewing did not significantly increase negative outcome expectancies as compared to the control group. This study used outcome expectancy measures that were meant for adults and did not tailor the intervention to fit the adolescent population.

Purpose

Due to the need to understand how these social cognitive theory mechanisms are affected by an intervention that uses MI (to address substance use in adolescents) it is important to study adolescents who are receiving a MI intervention. Therefore, the purpose of this study was to determine if MI positively impacts the variables; motivation, self-efficacy, and outcome expectancies in disadvantaged adolescents in a school setting. Participants will be collected from a community-based school for court adjudicated adolescents. They were identified as having difficulty with substance use by the institution and recommended for a brief intervention focused on substances. Participants received two motivational interviewing sessions at 50 minutes each. Data about the intervention was collected at baseline and following each session. Data was also collected during a four week maintenance phase following the conclusion of the intervention. A multiple baseline/single subject design was implemented and the data gathered was analyzed in this fashion.

Research Questions and Hypotheses

Research Question 1: Does a MI intervention significantly increase motivation to reduce or abstain from substances in adjudicated adolescents within a school setting?

Hypothesis 1: A MI intervention will significantly increase the motivation to reduce or abstain from substances in adjudicated adolescents within a school setting.

Research Question 2: Does a MI intervention significantly increase self-efficacy to refuse substances in adjudicated adolescents within a school setting?

Hypothesis 2: A MI intervention will significantly increase self-efficacy to refuse substances in adjudicated adolescents within a school setting.

Research Question 3: Does a MI intervention significantly increase positive outcome expectancies related to reducing or abstaining from substances in adjudicated adolescents within a school setting?

Hypothesis 3: A MI intervention will significantly increase positive outcome expectancies related to reducing or abstaining from substances in adjudicated adolescents within a school setting.

Research Question 4: Does a MI intervention significantly decrease positive outcome expectancies related to using substances in adjudicated adolescents within a school setting?

Hypothesis 4: A MI intervention will significantly decrease positive outcome expectancies related to using substances in adjudicated adolescents within a school setting.

Chapter II: Literature Review

Introduction

The purpose of this chapter is to describe the appropriateness of using a motivational interviewing intervention to increase adolescents' motivation to refrain from using substances, enhance their self-efficacy to refuse substances, increase their belief that using substances will lead to negative outcomes, and finally, to increase their belief that refraining from substances will lead to positive outcomes. The prevalence and etiology of substance use in adolescence is discussed herein. Then, the theoretical background of the mechanisms that lead to the reduction and cessation of substance use are defined and explained, leading to the empirical basis for the theory, the description of the intervention, and the rationale for its use.

Adolescent Substance Use

The National Survey on Drug Use and Health from the Substance Abuse and Mental Health Services Administration (SAMSHA) (2008) asked youths aged 12 -17 what they had used in the past month. In 2007, the two most pervasive substances reported were alcohol and marijuana, 15.9 % of youth surveyed reported they had used alcohol and 9.5% reported they had smoked marijuana in the past month. The survey also reported that 5.4% of adolescents met criteria outlined in the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association [DSM V, 2013]) for a substance use disorder for alcohol. Also, 4.3% identified as users of illicit drugs.

A more recent government survey from the National Institute on Drug Abuse (2010) reported prevalence among eighth grade students, tenth grade students, and twelfth grade students. The study reported that in the past four years substance use among

adolescents has remained stable across all grades and types of substance. Also, the percentage of students who use substances invariably increases through high school. In 2009, 36.6% of eighth grade students reported drinking alcohol sometime in their lifetime, 59.1% of tenth grade students, and 72.3% of twelfth grade students. Use of illicit drugs also increases among students as they mature. Eighth grade students surveyed report that only 1.7% have tried cocaine, while this percentage increases in tenth and twelfth grade students. This study also reported that the most heavily used substances among students were alcohol and marijuana. It was reported that 2.5% of twelfth grade students drink alcohol daily and 5.2 % smoke marijuana daily. These prevalence rates indicate widespread use of substances during adolescence.

Risks of use

There are multiple risks associated with substance use in adolescence, beyond the legal ramifications (Chassin, 2004). Substance use in adolescence has been related to a detrimental impact on transitions through adolescence and also an increase in the risk in substance disorders in adulthood. Also, adolescents who use substances are at an increased risk-of dropping out of school and obtaining a lower educational status.

Importantly, substance use in adolescence is linked to eventual mortality through several pathways, such as risky sexual behavior that leads to deadly disease, driving under the influence, involvement with gangs and other delinquents, and overdosing (Schulenburg, Maggs, Steinman, & Zucker, 2001). When adolescents engage in using substances they are at increased risk for these consequences. It is important to understand the etiology of substance use in order to treat it.

Etiology of Adolescent Substance Use

Several factors have been identified as contributing to the etiology of substance use in adolescence. These factors include developmental, cognitive, environmental, and genetic reasons (Schulenburg, Maggs, Steinman, & Zucker, 2001; Arthur, Hawkins, Pollard, Catalano, & Baglioni, 2002; Terry-McElrath, O'Malley, & Johnston, 2009; Conner, Helleman, Ritchie, & Noble, 2010). It is important to review these factors because they should be addressed when developing and implementing an intervention strategy.

Adolescent Development. Historically, adolescence is seen as a period of difficulty for many youths. G. Stanley Hall noted that transitioning to adulthood is very turbulent time (in: Schulenburg, Maggs, Steinman, & Zucker, 2001). He described this time as a reflection of our species' development from chaos into organized civilization, and every adolescent must experience this chaos to become an adult. Sigmund Freud also described adolescence as a tumultuous time during which the genital stage is brought on by puberty. During this phase sexuality is heightened and adolescents must break from their emotional dependence on their parents to become independent, leading to difficulties and turmoil.

Developmental models of adolescence. Schulenberg and colleagues (2001) review several developmental models that account for emerging substance use as a part of transitioning into adulthood. These models highlight adolescent development as an important factor in the initiation of substance use. The first is the Overload Model which reasons substance use in adolescence as a maladaptive strategy for coping with the overwhelming transitions in adolescence. They note that transitions are common during

this life stage and some adolescents choose substance use to cope with transitions.

Likewise, the Increased Heterogeneity Model interprets substance use as a method of coping with crises that arise within adolescence. Many adolescents go through crises that they are not yet equipped to handle in adolescence. These crises could be the passing of a care figure, such as a grandparent, or becoming homeless.

The third model that Schelenberg and colleagues (2001) review is the Mismatch Model, which explains substance use as a method for asserting independence and self expression during a time when a developing individual has little opportunity for these types of activities and lack of responsibility with on-going monitoring from parents and school. They note that it is well documented that adolescence is a life stage during which individuals form identities (as per Erikson) and will assert their independence and express themselves. Sometimes, adolescents will begin to use substances as a way to identify with a crowd and assert their independence from their parents (as their parents certainly would not advise them to use controlled substances). Finally, the Heightened Vulnerability to Chance Event Model explains substance use as an event which adolescents are vulnerable to because of the heightened state of flux they are experiencing. This model explains that adolescents begin to use substances because they are exposed to them when they are seeking identities and trying new things. Though adolescents are vulnerable because they are in a state of transition and have not yet developed coping skills for the new transitions they are experiencing. Even though there are several obvious developmental considerations, conscious cognitions and perceptual reasoning also play an important part in initiating and continuing substance use.

Cognition. Terry-McElrath, O'Malley, and Johnston (2009) studied the relationship between individual adolescents' cognitions and substance use. These were examined separately by type of substance. The reasons given related to the most alcohol use among high school seniors in 2001-2005 included "to have a good time," "to experiment," and "to relax." For marijuana, the top three perceptual reasons included "to get high," "to have a good time," and "to experiment." Other cognitions related to use were; "because of boredom," "to fit in," "to get away from problems," "because of anger/frustration," "to get through the day," "because I am hooked," and "to seek insight." The experimenters note that recreation was the most commonly reported reasons for many substances, but for illicit use of psychotherapeutic drugs the most commonly reported reasons were coping for negative affect and physical needs. These cognitions are copasetic with the developmental models behind substance use reviewed previously. Genetics also reveal information related to the use of substances in adolescence.

Genetics. Though the genetic aspect cannot be directly mediated through counseling intervention it should not be discounted as some adolescents will be more vulnerable because of them. Dopaminergic genes and a GABAergic gene have been hypothesized to be related to drug use among adolescents (Clark and Winters, 2002; Conner, Hellemann, Ritchie, & Noble, 2010). It is believed that hypodopaminergic functioning, reduced activity of the dopamine system, is caused by these genes on variant alleles and results in a blunted response to dopamine. This reaction is much like the withdrawal state caused by drug cessation which induces drug seeking behavior. Adolescents with specific combinations of these genes may be more susceptible to drug seeking behavior. This aspect can be moderately determined by finding out biological

family members drug use habits, as genetic testing is rarely optional. Family history should be taken into account when developing interventions for adolescents. The combination of developmental, cognitive, and genetic factors bequeath highly important information on the reasons for substance use among adolescents, however an environmental component has also been seen to contribute to the initiation, abuse, and dependence on substances.

Environment. Development, cognition, and genetics arise from within the individual, environmental factors impact the decision for substance use from the outside. Environmental factors that have been linked to substance use are known as risk factors for substance use. These risk factors can aid in prediction of adolescents at-risk for substance use (Jaffe, 1998). Adolescents who have had involvement with juvenile courts , are generally exposed to many environmental risk factors that have been linked to substance use, such as poverty and family conflict. The environment is explained as multiple spheres of influence, such as family, peers, school, and community (Arthur, Hawkins, Pollard, Catalano, & Baglioni, 2002). Several risk factors have been identified within these environmental spheres.

When developing a survey to assess risk and protective factors related to substance use and antisocial behavior in adolescents Arthur and colleagues (2002) listed several factors related to drug use. Family risk factors included; a) parental attitudes favorable to drug use, b) poor family management, c) high family conflict, and d) family history of drug use. Peer and individual risk factors included; a) rebelliousness, b) early initiation of antisocial behavior, c) peer drug use /antisocial behavior, d) attitudes favorable to drug use /antisocial behavior, e) sensation seeking /impulsiveness, and f)

peer rejection. An individual experiencing these factors among their peers is more likely to use substances. There were only two risk factors listed related to school, these included academic failure and little commitment to school. Finally, community risk factors included a. low neighborhood attachment, b) community disorganization, c) excessive mobility and transitions, d) normative attitudes favorable to drug use, e) perceived availability of drugs, and f) extreme economic deprivation. Please see Figure 1 for a visual representation of risk factors.

Figure 1. Antecedents of Adolescent Substance Abuse

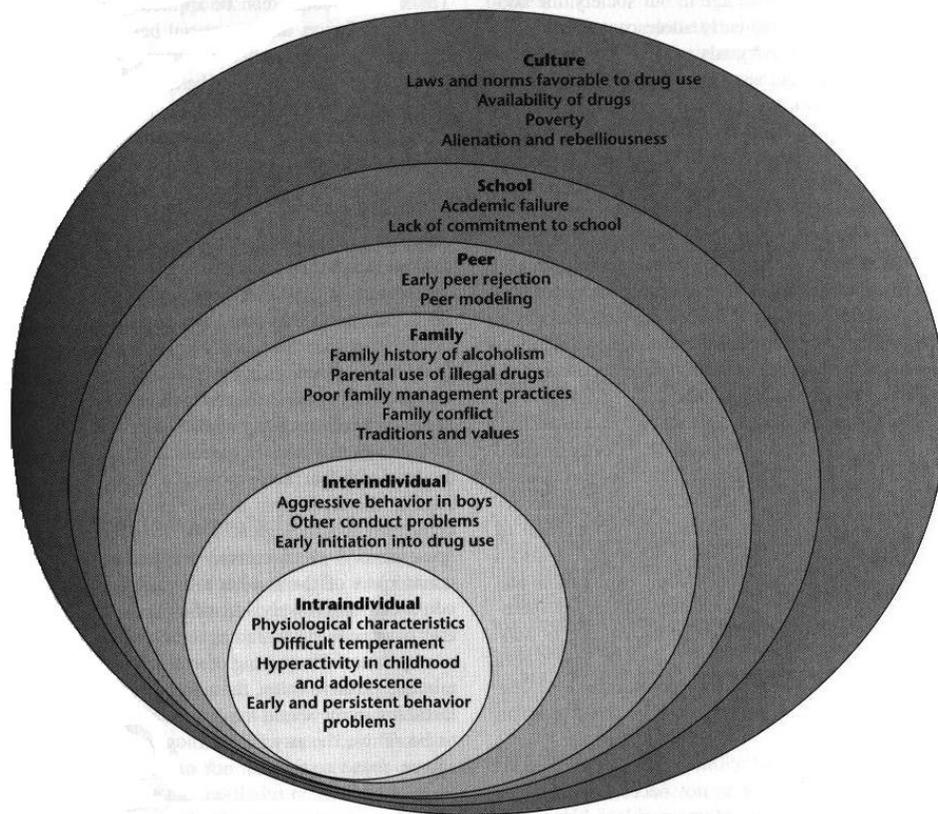


Figure 1. Risk factors depicted in five domains: Intraindividual, interindividual, family, peer, school, and culture. Adapted from *Developmental Psychopathology: From Infancy through Adolescence*, by C. Wenar & P. Kerig, p. 399. Copyright 2006 by McGraw-Hill.

At-Risk Adolescents. A variety of reasons contributes to the behaviors that lead an adolescent to become adjudicated. Many have committed crimes or engaged in violent behaviors making them dangerous to their families and communities. The rate of substance abuse is prevalent among these juvenile offenders (Myers, Brown, Tate, Abrantes, & Tomlinson, 2001). Others have additionally been removed from their homes by child services due to inappropriate care or abuse. As mentioned previously, adjudicated adolescents often carry more risk factors for drug and alcohol use than their peers who have not been through the juvenile court system. These adolescents may come from impoverished communities where substance use is viewed favorably (Arthur, et. al., 2002). Therefore, it is important to target them for treatment.

Lack of efficacious treatment for substance use can result in hazardous consequences (Chassin, 2004). Adolescents, already prone to risky behaviors, coupled with substance use can be in danger of mortality related to impaired driving, risky sexual behavior, involvement with the criminal justice system, and mortality related to overdosing. Substance use in adolescence has also been correlated with lower educational attainment, adult mental health problems, and pharmacological effects that impair adult functioning. Treatment is most important in this stage of life, as addiction pathology is almost exclusively initiated in adolescence (Schulenburg, Maggs, Steinman, & Zucker, 2001).

In summary, adolescence is a time of difficulty for many individuals. During this period of life many changes take place when coping skills are not yet developed to handle new situations. Adjudicated adolescents are typically exposed to more risk factors than their peers who have not gone through juvenile court. . These can include family conflict,

aggressive behavior, and poverty. Social cognitive theory (Bandura, 1977) provides a theoretical background that explains how these adolescents can avoid substance use and stay on a path that does not lead to dangerous behavior. From this theory, cognitive mechanisms related to the reduction or cessation of substance use can be identified to find effective treatments.

Theoretical Framework Related to Research Questions

Social Cognitive Theory

Albert Bandura's Social Cognitive Theory was developed in the 1940's (Bandura, 1977). The basis of this theory is that there are three arenas in which human (including teenagers) actions and mental processes are influenced. He identified these three arenas as behavior, personality, and environmental events. These interact within the individual to influence actions and cognitions. Bandura called this interaction "triadic reciprocity" or reciprocal determinism. He uses the word 'reciprocal' to indicate that these three factors are interacting simultaneously and mutually. Thoughts and actions are determined by these three factors, thus he also refers to these factors as 'determinants.'

Determinants. Personal determinants are factors that are internal, such as cognitions, feelings, and biological events. Environmental determinants are events that impact the individual. Adolescents do not have control over the demands put upon them by their environment. This makes it difficult for them to successfully navigate the environment to produce desired consequences for themselves. Behavioral determinants are physical actions made by an individual. These actions influence both of the other determinants and are also influenced by the other determinants. A behavior or action can influence personal and environmental determinants. For example; an adolescent refusing

alcohol at a party could cause several different consequences personally and environmentally. If the adolescent refuses alcohol, he or she could think “Now my friends think I am not a fun person.” or “Now I will be able to study and get a good grade for a test on Monday.” This is an example of how behavioral determinants can influence personal determinants. The act of refusing alcohol can also impact the environment. An environmental consequence would be the peers of the adolescent pressuring for the individual to drink or ignoring the individual. These environmental determinants also have an impact on the behavioral and personal determinants of the individual. Thus, through triadic reciprocity an adolescent’s thoughts and actions are influenced.

Adolescents are going through many changes and seek to individuate themselves by interacting with their environment without supervision (Schulenberg et. al., 2001). Therefore, personal determinants, specifically cognitions, can influence behavioral and environmental events. By using a therapeutic technique that assists in developing cognitions that give the adolescent a way to regulate his or her behavior and navigate the environment, positive outcomes can be achieved. Revisiting the previous example of being offered alcohol at a party, the adolescent will have several different cognitions related to the decision to drink or not to drink the alcohol. Due to the developmental position that the adolescent is in (e.g. wanting to try new things, to find an outlet for stress, or having no skills to cope with the situation) it is likely the adolescent will accept. Bandura points out that it is important for an adolescent to have the skills to navigate their environment lest they become products of the environment (Bandura, 1986). To understand how these skills are acquired Bandura explains the ways in which adolescents are able to think.

Mental processes and capabilities. Bandura (1986) describes five mental processes through which individuals learn. These capabilities are relevant to gaining the skills needed to regulate behavior and make sense of the environment through mental cognitions. The first mental process is the ability to think abstractly. Through this process, individuals can problems solve through cognitions without interacting with the environment. There is also the ability to understand abstract representations, such as numbers or letters. Adolescents also have the capability of forethought. They are able to plan what they will do before doing it, through this they will be able to choose an action. Bandura also notes that individuals are able to learn vicariously through watching others. Finally, the ability to self regulate and self-reflect on behavior is also an important capability relevant to gaining skills. The adolescent who can reflect on the behaviors of others will be able to see how they are able to exercise more control over their environment.

Specific behavior regulating mechanisms. Adolescents have these capabilities that influence their cognitions along with how their behavior and environment influence their cognitions. However, Bandura becomes more specific in explaining exactly what kinds of cognitions and skills are necessary to influence or change behavior, specifically, motivation, self-efficacy, and outcome expectancies.

Motivation toward a goal is a director of behavior and will influence behavior through the forethought capability. For example, if an adolescent's goal is to do well on a test on Monday, he or she will think "If I drink on Saturday it will be difficult to study for the test." thus influencing behavior toward refusing alcohol.

Self-efficacy is the confidence the individual has, or the belief in one's own ability to successfully execute an action toward and expected outcome. For example, if the adolescent has confidence in his or her ability to refuse the alcohol, it is more likely that he or she will refuse the alcohol.

Outcome expectancy is an individual's belief of what will happen given a specific event. An adolescent may expect that his or her test score will be worse if alcohol is consumed and better if alcohol is not consumed. In the context of this paper, these are the specific mechanisms through which adolescent substance use behavior is influenced. Figure 2 shows the pathway Bandura describes (Bandura, 1977). These mechanisms and the empirical evidence for these mechanisms are discussed in subsequent paragraphs.

Figure 2. Efficacy Expectations and Outcome Expectations

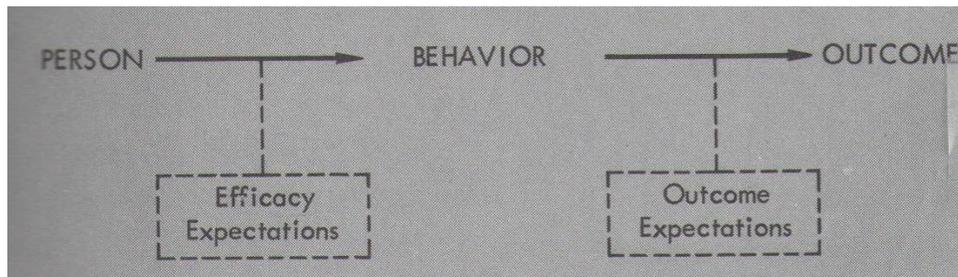


Figure 2. The cognitive pathway from person to outcome. Adapted from *Social Learning Theory*, By A. Bandura, p. 79. Copyright 1977 by Prentice Hall.

Motivation

Motivation is conceptualized on a continuum of readiness (Prochaska, DiClemente & Norcross, 1992). How ready an adolescent is to do something translates to how motivated or how determined he or she is to do something. Bandura's social cognitive theory refers to readiness as 'intention.' He writes, "In social cognitive theory, intention plays a prominent role in the self-regulation of behavior. An intention is defined as the determination to perform certain activities to bring about a certain future state of

affairs.” (pg 467, Bandura, 1986). Whatever motivation is called, be it ‘readiness’ or ‘intention’ it is agreed that it has a central influence upon behavior and it is not as simple as being motivated or unmotivated. There are many factors that contribute to the readiness to commit a certain action. Bandura notes that motivation begins with having a goal (Bandura, 1986). By having a goal or standard, the adolescent will have something to work toward. Without a goal there is no clear standard with which to evaluate their behaviors. With a goal, a discrepancy can be made between the behaviors that bring the adolescent closer to a goal, or farther away. An example of a goal would be; refusing alcohol at the party to do well on Monday’s test, with this goal the adolescent would be able to evaluate his or her behaviors leading up to the goal. Drinking on Saturday would be discrepant with studying for the test. Bandura also iterates that the individual must believe that he or she is ready and able to achieve the goal. He termed this belief as ‘self-efficacy.’ Having self-efficacy, or having the belief that the goal can be achieved is important when adopting the goal in the first place.

Self-efficacy

Bandura defines self-efficacy as; “the conviction that one can successfully execute the behavior required to produce a certain outcome.” (Bandura, pg 79, 1977). If the adolescent does not believe that he or she can resist the alcohol it is more likely that the alcohol will not be refused. Actions are taken when the individual believes that the actions are possible. Self-efficacy beliefs are achieved through the symbolizing, reflecting, and forethought capabilities (Bandura, 1986). The individual sees others acting in a certain way and believes that he or she also has the ability to act this way. Also, if an action is attempted successfully beforehand, the individual believes that he or she will be

able to do it again. Self-efficacy can be broken into two types; general and specific. General self-efficacy is the belief that one can accomplish most things that he or she attempts, such as; “I can do well at school.” or “I can get along with people.” Specific self-efficacy beliefs are tied to specific actions. Examples of specific self-efficacy beliefs are; “I will be able to refuse alcohol if asked by a friend at the next party.” Specific self-efficacy beliefs are more measurable and more predictive of actual behavior (Oei, Hasking, & Philips, 2007). This will be discussed later in the chapter. The second part of Bandura’s definition of self-efficacy (stated above) is “produce a certain outcome.” An adolescent has an expectation of what consequences his or her behavior will produce. These expectations are termed ‘outcome expectancies.’ Bandura posits that outcome expectancies are also central to motivation. Behavior occurs when the individual believes that the outcome of the behavior is desirable.

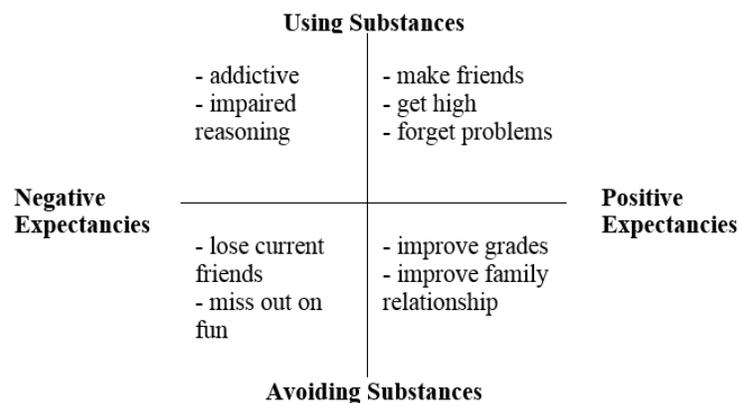
Outcome Expectancies

In social cognitive theory, the way an individual acts is largely dependent on the anticipated consequences of the action (Bandura, 1986). An ‘if-then’ framework is often applied to explain outcome expectancies. Adolescents who have the goal of doing well on Monday’s test will have the outcome expectation; “If I do not drink on Saturday night, then I will be able to study for Monday’s test.” This outcome expectancy will lower the chance of accepting alcohol at the party. Bandura explains that there are many pathways to developing outcome expectancies for actions. Adolescents, who are going through many changes, have a difficult time making accurate judgments of outcomes related to their actions. Many times, they are experimenting. It is important when finding a mode of

therapy for substance use to take into account the possible unrealistic outcome expectations of the adolescent.

There are also several different ways to look at outcome expectancy as related to substance use. There are expectancies related to acting and not acting. In other words, there are different outcomes for drinking and refusing to drink. Another way to look at expectancy is by looking at the positive expectancies and negative expectancies. Specifically, there are positive and negative consequences that will come from either acting or not acting. Please see Figure 3 for a visual representation of the different dimensions of outcome expectancies.

Figure 3. Dimensions of Outcome Expectancies



The combination of having the motivation toward a certain goal, the self-efficacy to achieve the goal, and positive outcome expectations of accomplishing the goal is a pathway to what Bandura calls ‘corrective learning’ or behavior change (Bandura, 1977). Therefore, therapies which focus on enhancing motivation to refuse substances, supporting the self-efficacy to refuse, and promoting the positive outcome expectations to refuse will result in corrective learning. There is empirical evidence that these

mechanisms are indeed useful components in the reduction of substance use for people, including adolescents (Chung et. al., 2011; Slavet, et. al., 2006).

Empirical Evidence for Mechanisms

Empirical evidence for motivation mechanism. Several studies have focused on motivation, self-efficacy, and outcome expectancies as individual mechanisms for the reduction of substance use. As stated above, motivation is often conceptualized as ‘readiness,’ the term ‘readiness’ was introduced when researchers were looking for a common factor between people who were addicted to alcohol and able to quit (DiClemente, Schlundt, & Gemmell, 2003). When interviewing people who successfully started to manage alcohol addiction the term readiness was used to indicate how motivated the person was. The individual would say sentences such as; “I wasn’t ready before.” and, “I quit when I was ready.” As explained by social cognitive theory, motivation or readiness to refrain from the use of intoxicating substances is part of how behavior change occurs.

Joe and colleagues (1998) looked into variables that would predict retention and engagement of adults in substance abuse treatment. The variables that they examined were ‘problem recognition,’ ‘desire for help,’ and ‘treatment readiness.’ They also looked into demographic variables, including; race, gender, and marital status. Of the variables they examined treatment readiness was the most predictive of retention and engagement.

Similar results have also been produced in incarcerated youth receiving substance use treatment (Slavet, et. al., 2006). When measuring the participants’ motivation to change marijuana use the investigators found that higher scores on a readiness measure predicted higher treatment engagement. This study involved incarcerated youth at a

juvenile facility. The age range of participants was 6-17 years old (mean = 12.39). Every participant (n = 122) reported marijuana use prior to being incarcerated.

To measure readiness the investigators used a visual analog of a ladder with each rung representing a statement about their readiness (e.g., 1st rung = I have no interest in changing the way I use marijuana, 6th rung = I plan to change my marijuana use, but I am not ready to make plans to change). To measure treatment engagement, the participants were administered a questionnaire specific to how engaged they were during treatment (higher scores signify more engagement). Marijuana use was also measured in frequency, quantity, and intensity by self-report. Baseline was taken during treatment and a follow-up assessment was completed after release from the facility.

At baseline, positive treatment engagement was correlated with a higher rating on the on the readiness measure ($r = .46$). Results also indicated that a higher score on the readiness measure was correlated to a decrease in the quantity ($r = -.54$), frequency ($r = -.62$), and intensity ($r = -.24$) of marijuana use at the three month follow-up post release. These results lend credence to the idea that intention to change behavior is predictive of actual behavior, as per social cognitive theory.

A similar study measured readiness to change tobacco use in adolescents who were receiving substance use treatment (Chung, et. al., 2011). In this study, adolescents (aged 14 – 18) were recruited from outpatient substance abuse programs. Data were collected at baseline, 6 month follow-up, and 12 month follow-up. Readiness to change was measured by a visual analog of a ruler. This ruler had statements on it such as “not ready to change”, “unsure”, and “trying to change.” During data collection at each of the three data collection points, adolescents reported how many cigarettes they smoked per

day (for the past 30 days) and also rated on the ruler how ready they were to change their smoking behavior.

To examine how correlated/predictive the readiness measure was, hierarchical regression analyses were used. These data showed that higher scores on the readiness measure at 6 months were significantly correlated (change $r^2 = .41$) with more abstinent days at 12 month follow-up. This indicates that adolescents who reported higher readiness smoked fewer days than adolescents who reported lower readiness. These results are concurrent with social cognitive theory. If the adolescent is more ready/motivated to avoid smoking, then it is more likely that he or she will.

Readiness has also been seen to correlate with better outcomes for adolescents with alcohol difficulties (Maisto, et. al., 2011). Most of the adolescents in this sample reported that they were receiving treatment for alcohol or marijuana use. During recruitment, adolescents were asked to participate in the study regardless of what substance they were receiving treatment for, as long as they reported using alcohol in the past 30 days.

This study examined data about the adolescents' drinking habits. Data were collected at baseline, 6 month, and 12 month follow-up. Adolescents were asked how many days (in the past 30) did they abstain from alcohol, and also how many drinks were consumed during a drinking day. Pearson correlations confirmed the investigators' hypotheses that higher scores on the readiness measure correlated with more days of abstinence ($r = .59$) and fewer drinks consumed during a drinking day ($r = -.54$). These results were from the 6 month follow-up. This study also used the visual analog of the ruler to measure readiness. How motivated or how ready an adolescent is to avoid

substances is an important contributing factor to actual behavior. However, social cognitive theory also includes self-efficacy as an important part (Bandura, 1977).

Empirical evidence for self-efficacy mechanism. The construct of self-efficacy is more complicated than motivation, as there are different types of efficacy (i.e. general vs specific). Oei and colleagues (2007) studied the differences in the predictive validity of general versus specific self-efficacy in drinking behavior. Their hypothesis was that task-specific self-efficacy was more predictive of behavior than general self-efficacy. The participants in this study were adults who were recruited from detoxification units in hospitals and also adults from the community who did not have drinking difficulties.

The investigators measured the specific self-efficacy task of refusing to drink alcohol. Three conditions were addressed in a self-report format. These three conditions were; refusing to drink while under social pressure, refusing to drink when in need of emotional relief, and refusing to drink when the opportunity arises. General self-efficacy was measured by a self report questionnaire. This questionnaire had statements that did not refer to specific situations or behaviors (e.g. I can accomplish what I want to accomplish). Drinking was measured in frequency (days per year) and volume (grams per year). These data were collected at one time point, when the clinical sample was receiving detoxification, and mailed to the community sample.

Drinking refusal self-efficacy was seen to be predictive of behavior in the community sample, but not in the clinical sample. In the community sample, higher scores on the drinking refusal questionnaire were negatively correlated to both frequency ($r = -.52$) and volume ($r = -.57$). These scores indicate that as self-efficacy increased then volume and frequency of drinking decreased. For general self-efficacy, the correlations

were insignificant. The difference between the clinical and the community sample may be due to the sensitive time the data were collected for the clinical sample. Participants entering detoxification typically have been unsuccessful in drinking refusal. Therefore, it is possible that data collected during or following treatment may be more reflective of behavior. The investigators concluded that; “The results for the community sample provide support for Bandura’s concept of self-efficacy, and are consistent with other studies reporting that drinking refusal self-efficacy is a salient predictor of alcohol consumption.”

Drinking refusal has also been studied in adolescents (Young, et. al., 2007). In a sample of adolescents (aged 12-19) drinking was measured in both frequency (days of drinking per week) and volume (amount of alcohol consumed per week). These adolescents were recruited from middle and high schools in a metropolitan area.

Refusal was measured by self-report on a questionnaire that asked about specific situations where the adolescent might drink (i.e. when my friends are drinking, when my parents are not home, when I am offered a drink, etc) the adolescents rated these situations by how likely they were to refuse drinking. Higher scores on the measure were indicative of greater refusal self-efficacy.

The results showed that as the scores on the self-efficacy measure went down, the frequency and volume of drinking alcohol became higher. The correlations between the total self-efficacy score and frequency and volume were significant (frequency: $r = -.37$ and volume: $r = -.36$ respectively). The authors concluded that having less self-efficacy predicted more drinking.

In a sample of young women who reported having difficulty with marijuana refusal self-efficacy was positively correlated with prior attempts to quit using marijuana (Caviness, et. al., 2013). The mean age of the women was 20. Approximately 20% of the women were unemployed and almost 40% were not attending college. The finding of this study that is most relevant is that motivation to quit had no correlation with self-efficacy to quit. This suggests that these factors are separate and should be addressed individually in intervention. The final factor that social cognitive theory lists as being important to behavior is outcome expectancy. This factor has also been studied as a predictor of substance use behavior. Outcome expectancy is also complicated as it can be measured several different ways. It is measured by asking the participant, “What will happen if you use.” and it is also measured by asking the participant, “What will happen if you *do not* use.” The literature also addresses the differences between positive outcome expectancies and negative outcome expectancies.

Empirical evidence for outcome expectancy mechanism. Jones and McMahon (1994) investigated the difference in predictive ability between the positive and negative expectancies of using alcohol. They hypothesized that negative expectancies would be more predictive of relapse (following in-patient treatment) than positive expectancies. Within their assessment instruments they included two types of negative expectancies termed; ‘proximal’ and ‘distal.’ Proximal negative expectancies are consequences that will occur immediately following use such as; black outs, vomiting, or fighting. Distal negative expectancies are consequences that will occur later such as; being fired from work, significant other leaving, or poverty.

The results indicated that for adults in recovery from alcohol addiction, negative alcohol expectancies were more predictive of relapse than positive. The more negative alcohol expectancies, the less likely the participant was to relapse. They noted that positive alcohol expectancies were not predictive of relapse. Adolescents are different from adults in that they usually do not have the same experiences and therefore they do not have the same expectancies of using alcohol. This is due to both the amount of time they have spent using the substance and also the developmental stage they are in, distal consequence may not be as salient (Schulenburg, et. al., 2001).

Positive expectancies were found to be more predictive of behavior than negative consequences in a sample of adolescents who use tobacco (Urban & Demetrovics, 2010). The participants in the study were recruited from public high school and the mean age was 16.6 years-old. Tobacco use was measured by how many cigarettes were smoked in the past 30 days. Expectancies were measured by a self report questionnaire with four domains; positive reinforcement, negative reinforcement, negative consequences, and weight control.

The correlations between the variables indicated that adolescents who endorsed the positive expectancies (the reinforcement and weight control domains) smoked more than did the adolescents who did not endorse the positive expectancies. Negative expectancies did not correlate with smoking behavior. In other words, if the adolescent had negative expectancies, it did not impact how much tobacco he or she used ($r = .06$). The investigators note that only distal consequences for smoking were included on the questionnaire and there were no short term negative consequences listed.

Positive expectancies were also found to be predictive of alcohol use behavior in a sample of middle school students from a rural area (Martino, et. al., 2006). In this study the investigators used a questionnaire to assess expectancy outcomes of drinking alcohol. The questionnaire included items about immediate outcomes that were both positive and negative such as; drinking alcohol makes you feel happy or drinking alcohol makes you act stupid.

The scores from the items were compiled together into one factor called “alcohol positivity.” Based on how a student scored, their alcohol positivity score could be either positive (indicating they endorsed more positive items) or negative (indicating they endorsed more negative items). The results from the study indicated that positive expectancy increased from 8th grade to 9th grade and alcohol expectancies were more positive among students who drank than students who did not drink.

Nikoletti and Taussig (2006) studied the predictive ability of positive and negative substance use expectancies in a sample of adolescents removed from their homes due to insufficient care. These adolescents are at-risk for substance use due to several risk factors associated with lack of care, and being removed from the home. Substance use among the adolescents was measured by self-report, asking the participants how frequently they used illicit substances in the past year. Expectancies were measured by asking how likely a specific outcome would occur if a substance was used. Both proximal and distal consequences were provided. The results from the data indicated that after controlling for age, negative expectancies were not associated with substance use. However, having more positive expectancies predicted more substance use. It may be that in adolescence, positive rewards are more motivating than negative consequences.

In summary, positive expectancies predict behavior more so than negative expectancies in the adolescent population. However, more relevant for treatment purposes are the positive and negative expectancies of abstaining from substances, because that is the behavior you are asking the adolescent to adhere to. It also fits the social cognitive theory model of behavior (i.e. having the motivation to abstain from substances, the self-efficacy to abstain from substances, and the outcome expectancies related to abstaining from substances).

Mechanisms and Treatment

Counseling treatments. When referred to a substance abuse treatment program, adolescents can receive a variety of counseling interventions. Some of the most common interventions include; cognitive-behavioral therapy, contingency management, multidimensional family therapy, and multisystemic therapy (Deas, Gray, & Uphadyaya, 2008; Horsfall, Cleary, Hunt, & Walter, 2009). Each of these is a four to six month evidence-based counseling therapy specifically redesigned from use with adults to use with a younger population.

Cognitive-behavioral therapy has two aspects. The behavioral aspect focuses on addressing substance use in the context of antecedents and consequences (Deas, 2008). While the cognitive aspect of the therapy uses skills training in the areas of problem solving, drug refusal, and mood management to improve the client's interaction with his or her environment (Scoyoc, Stanger, & Budney, 2009). This therapy does not address adolescents' motivation to stay away from substances, which according to social cognitive theory, is a key part that leads to better outcomes.

Contingency management is a therapy that uses functional analysis of behavior and self-management planning as a behavioral approach to substance use. Often, concrete rewards for desired behavior are utilized as well (Henggeler, Sheidow, & Cunningham, 2008). An example of a contingency management plan would be; if the adolescent has a clean drug screen then they will be rewarded with a desired object or be allowed to participate in a desired activity. However, this therapy is only efficacious if the reward from the therapy is greater than the rewards of the substance use.

Multidimensional family therapy extends treatment to include the family. Parents are treated along with their child to improve their engagement with the child, parenting skills, and their individual psychosocial functioning (Liddle, Dakof, Turner, Henderson, & Greenbaum, 2008). Unfortunately this is only helpful to families that will participate in treatment. Often, adjudicated adolescents lack a positive support system and familial involvement is minimal.

Multisystemic therapy is a home-based treatment delivered by a therapist who uses several different techniques toward mitigating family, peer, school, and community factors related to substance use (Liddle, Dakof, Turner, Henderson, & Greenbaum, 2008). A defining feature of this approach is that the therapist is made available to the client 24 hours a day and seven days per week in order to be able to integrate treatment completely. This therapy is useful to adolescents in the community. However, once the therapist is not available, the adolescent may not have the skills to refrain from substances. When the social cognitive theory mechanisms are addressed in treatment the adolescent will have the skills and motivation to refrain from substances.

Based on social cognitive theory, the three mechanisms that contribute to actual behavior are motivation, self-efficacy, and outcome expectancy. In addition to theory, these mechanisms also have empirical evidence that links them to adolescent substance use behaviors. There are many different kinds of therapies that adolescents can receive when referred for treatment, however, none explicitly include the social cognitive therapy mechanisms. Motivational Interviewing is a therapeutic technique that addresses these mechanisms specifically while also meeting the needs of adolescents at-risk for substance use difficulties.

Motivational Interviewing: Historical Background and Theory

Motivational Interviewing (MI) was first developed by William R. Miller in 1983 for use with adults addicted to alcohol (Miller & Rollnick, 2004). This counseling style fits with social cognitive theory. Due to its flexibility as an approach and usefulness as a brief intervention, it is applicable in many contexts (Miller & Rollnick, 2009). The most current definition of MI is “a directive, client-centered counseling style for eliciting behavior change by helping clients to explore and resolve ambivalence” (Motivational Interviewing, 2010). When this counseling style is used as an intervention for substance use, it is normally delivered within two or three 50 minute sessions (as opposed to other therapies which are four to six weeks). It was originally conceptualized as a guiding style that helped the client increase their motivation or readiness to change their substance use behavior (Amrhein, Miller, Yahne, Palmer, & Fulcher, 2003). MI is used specifically for reaching a change goal when the client is resistant or ambivalent to change and is not to be used with clients who have already committed to change or do not have a change goal (Miller, 2009).

Motivational Interviewing and Social Cognitive Theory

Social cognitive theory argues that behavior is directed through motivation, self-efficacy, and outcome expectancies. By assisting adolescents in increasing readiness, increasing self-efficacy, and encouraging positive expectancies with changing substance use, MI is an efficacious intervention to use with adolescents. William Miller, lists the ‘processes of change’ as things that the adolescent needs to believe that he or she has a) desire for change, b) ability to change, c) reasons for change, and d) need for change (Miller & Rollnick, 2004). Please see figure 4. Having the desire and the need for change can be conceptualized as the motivation to change, or as Bandura defines it, the intention to change. When the term ‘ability’ is used, it makes reference to having self-efficacy. If the client does not believe in his or her ability to change he or she is less likely to attempt the behavior. Reasons for change are positive outcome expectations related to abstaining from substances.

Figure 4. Processes of Change

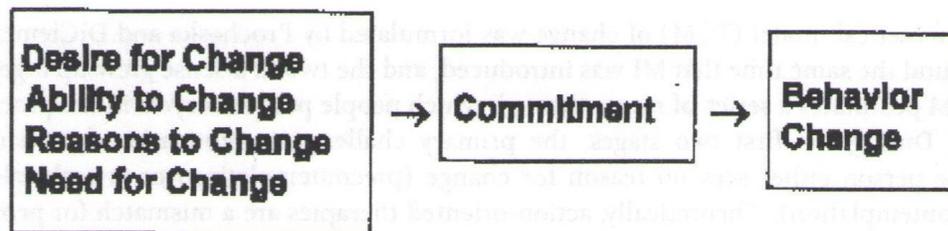


Figure 4. The four processes of change. Adapted from “Talking Oneself into Change: Motivational Interviewing, Stages of Change, and Therapeutic Process,” by W. R. Miller and S. Rollnick, 2004, *Journal of Cognitive Psychotherapy: An International Quarterly*, 18, p. 303. Copyright 2004 by Springer Publishing Company.

There are four strategies within MI that are meant to enhance readiness to abstain from substances. These four principle strategies encourage and support the adolescent

toward committing to positive goals. The first strategy is expressing empathy. This strategy is used to build rapport so that the adolescent can be free to express themselves without judgment or criticism. The second strategy is to ‘roll with resistance.’ When the adolescent is resistant to changing substance use behavior the counselor is accepting of it. The counselor uses the resistance to learn about the adolescent’s thoughts and feelings about change. This strategy is of particular importance for adjudicated adolescents. Adolescents who have been through juvenile courts are customarily resistant to treatment because their autonomy has been removed and they are put into treatment without their consent. By ‘rolling with resistance’ the counselor increases the adolescent’s trust, thus leading to more compliance. An example of a “rolling with resistance” interchange would be:

Adolescent: “You’re just like everyone else here, telling me drinking is wrong and everything I do is wrong.”

Counselor: “It sounds like you feel that adults having been judging you since you came here. I don’t want to jump to any conclusions about you. What do you want to talk about?”

By avoiding arguments and redirecting the conversation the counselor is better able to address the topics that are of concern to the client.

‘Supporting self-efficacy’ is a third strategy used to enhance motivation. This strategy fits directly into social cognitive theory in that feeling that a goal can be successfully achieved is part of being motivated. The counselor encourages the adolescent to believe that he or she can abstain from substances in order to achieve his or her goals. Therefore, the counselor will support the adolescent’s belief that he or she can

change their substance use behavior. The counselor will also support any positive goals that the adolescent put forth.

A final strategy that MI counselors use to enhance motivation is ‘developing discrepancy’ between goals and actions. This strategy also fits into social cognitive theory. By pointing out the discrepancies between goals and behavior, the counselor is reminding the adolescent of the negative outcomes of using substances and the positive outcomes of abstaining. For example, if the adolescent would like to get a good grade on Monday’s test, but would also like to drink during Saturday’s party, the counselor would say “It sounds like it’s important to you to get a good grade on the test, but being hung-over on Sunday would interfere with that goal.” thus eliciting reasons to change to change behavior, or eliciting positive outcome expectancies associated with changing behavior.

In summary, though MI is not based on social cognitive theory, it has the ability to elicit positive change through the same mechanisms that Bandura explains (i.e. motivation, self-efficacy, and outcome expectancies). The next several sections explain this counseling style in more detail beginning with the essential elements of MI.

Elements

Rosengren (2009) detailed four essential elements of MI. These are the MI spirit, change talk, MI principles or rules, and O.A.R.S. The combination of these four elements is what makes up the core of MI (Figure 5). Also, these elements give measurable directives to the principle strategies in order for counselors to be able to implement them reliably.

Figure 5. Elements of Motivational Interviewing

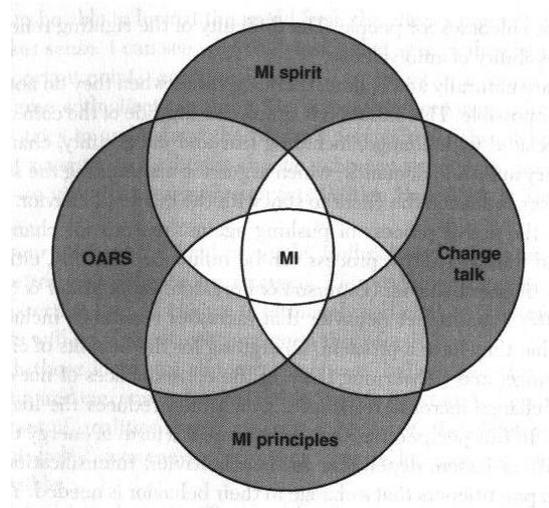


Figure 5. Elements of Motivational Interviewing. Adapted from *Building Motivational Interviewing Skills: A Practitioner Workbook*, by D. B. Rosengren, p. 9. Copyright 2009 by Guilford Press.

Firstly, the ‘MI spirit’ is a philosophy that guides the delivery of the intervention. There are three components to this spirit; collaboration, evocation, and autonomy. While conveying the spirit of MI to the client during the intervention the counselor makes clear that they are in a working partnership. This collaborative stance ensures that client is respected as an expert on his or her self, because resistance will be encountered if the adolescent believes you are judging him or her. It will also create a positive working environment in which the adolescent can be open to ideas of change. Evocation, the second component, refers to the counselor being able to evoke solutions from clients rather than give solutions to them. To draw ideas of change from adolescent is a central aspect of the MI spirit. Finally, within the MI spirit the counselor will recognize the autonomy of the client. It is important to relate to the client that he or she is ultimately responsible for the decisions made.

Giving an adolescent who has been adjudicated and placed in an alternative school setting a feeling of autonomy will greatly impact the relationship between the adolescent and the counselor. However, this may be the most difficult for the counselor, as adolescents will often choose paths that lead to negative outcomes for themselves and others. It is natural for the counselor to want control in this situation. However, taking control can make the adolescent resistant to change and has a detrimental impact on self-efficacy. The adolescent will only commit to the change that he or she argues for. This argument is called 'change talk' the second element of MI.

Change talk is a specific kind of speech that the client engages in when expressing their thoughts of positive outcome expectancies related to abstaining from substances. This speech is a verbal commitment to change and indicates that the client is thinking about modifying behavior. Eliciting change talk is a central goal of the intervention. Examples of change talk include direct commitments, "I will stop drinking." and indirect commitments, "I know something has to change."

Amrhein and colleagues (2003) studied the frequency and strength of change talk related to how many days the client remained abstinent. The direct change talk was coded as the most strong change talk, while more indirect change talk was coded as weak. For this study the investigators video taped 84 clients sessions, cataloged and coded their speech, and kept track of the amount of days each remained abstinent.

The participants were grouped by ultimate therapy outcome; the changers (increased days abstinent), the maintainers (same amount of days abstinent), the strugglers (less days abstinent), and the discrepant (variable days abstinent). The results indicated that the strength of change talk was predictive of therapy outcome. Therefore,

more direct change talk is more predictive of client change. Rosengren (2009) warns that if the counselor starts to argue in order to elicit change talk the client can then argue against it. This will go on until the client convinces him or her self not to change. This is part of the rules or principles of MI.

The third element is detailed by the acronym, R.U.L.E.

R-Resist the righting reflex. It was mentioned previously that it is natural for the counselor to want to correct the adolescent when he or she voices an incongruent idea to change. The counselor must try to avoid arguing for the benefits of change, convincing the client to see the problem, telling the client how to change, or warning them of consequences. Giving adolescents something to argue against will increase their resistance to change.

U-Understand the client's motivations. The counselor must recognize the motivations already within the client rather than trying to instill them. If the client sees the motivation to change already within him or her self it will be more acceptable to take steps toward change. To understand the adolescent's motivations the counselor must listen to him.

L-Listen to the client. This is an aspect important in any type of therapy. It is especially needed in MI to create an atmosphere in which the adolescent can express the desire to change. An atmosphere is created through the use of reflective listening and by conveying an attitude of acceptance toward the client's feelings and perspectives. If the adolescent does not feel comfortable with the therapist it is unlikely that he or she will feel comfortable with change.

E-Empower the client. Empowering the client refers to cultivating self-efficacy in the adolescent and warns against confusing it with self esteem. A client can possess a high self-esteem without self-efficacy. This is especially true when talking to an ambivalent adolescent. An example would be; “I am great the way I am, I can’t change” This rule is particularly important for adolescents who are placed in an alternative school setting due to delinquent actions. It is likely that they feel completely powerless due to the situation they are in. Enhancing self-efficacy in some area will help them to feel they have some control.

The final element is the grasp of the basic skills of counseling (Rosengren, 2009). These skills are summarized by the acronym O.A.R.S. and are a pattern that should be followed during a session to direct the client toward change talk.

O-Open-ended questions are used to spur the client to share ideas and motivations.

A-Affirmations are used to create an environment of acceptance in which the client will be able to work toward change. Affirmations can also be used to encourage self-efficacy.

R-Reflective listening is used to establish and maintain rapport with the client while helping the counselor to understand.

S-Summaries are used to relate what the client has said that is pertinent to their motivation to change and the nature of their problem. Putting the principle strategies and the elements together makes up the techniques used within the intervention.

Miller and Rollnick (2009) note that MI is not a technique itself and should not be referred to as a technique. The term technique implies that MI is simple and there is a

specific protocol to follow. They argue that MI is more complex and cannot fit into a formulaic method. When MI is manualized the spirit of MI is taken away and the intervention is no longer an MI intervention. They postulate that MI used as a guiding approach will be more efficacious than when used as a technique. However, there are also several other key points to keep in mind when thinking about using MI.

Key Points of Motivational Interviewing

Miller explains that there are seven key points to MI (Motivational Interviewing, 2010). a) The first is that motivation to change is elicited from the client, and not imposed from without. The counselor is meant to use the intrinsic values of the client rather than coerce or confront the client toward change. b) The second key point is that it is the client's task, not the counselor's, to articulate and resolve his or her ambivalence. c) Third, is that direct persuasion is not an effective method for resolving ambivalence. d) The counseling style being generally quiet is the fourth key point to MI. e) Fifth, the counselor is directive in helping the client to examine and resolve ambivalence. This directive manner is not meant to train the client in skills needed to change, but to help in guiding the client past ambivalence. f) The sixth key point is that readiness to change is not a client trait, but a fluctuating product of interpersonal interaction. This point highlights that change readiness is actually feedback on counselor behavior. This resistance is reflecting the counselor's belief that the client is ready to change when he or she is not. g) The final key point is that the therapeutic relationship is more like a partnership or companionship than expert/recipient roles. This point is to emphasize that the counselor respects the autonomy of the client including the poor decisions that he or she might make. With these key points in mind it is important for the counselor to avoid

an authoritative manner as it increases resistance and sustain talk which inhibits change (Miller & Rollnick, 2004).

Characteristics of Motivational Interviewing

Briefly, four characteristics that describe this approach are; a) client-centered, b) addresses ambivalence, c) directive, and d) focuses on client speech. The speech of the adolescent is important to focus on because it serves as progress monitoring during the sessions and can be used to evaluate how well the intervention is progressing. The counselor wants to elicit what is known as ‘change talk’ (Miller & Rose, 2009). Change talk is language from the client that indicates motivation for change (i.e. a positive outcome expectancy related to abstaining from substances). An example of change talk would be “I want to do well on Monday’s test so I’ll try not to drink this weekend.”

Conversely, the counselor wants to counterchange arguments of ‘sustain talk.’ Sustain talk includes phrases such as “I like to drink on the weekends and I won’t stop.” and “I can drink and study at the same time” Change talk and sustain talk can be conceptualized as outcome expectancies and are thus indicators of substance use behavior. Increasing change talk and decreasing sustain talk or increasing positive expectancies related to not using and decreasing negative expectancies of not using will enhance motivation to abstain. This is a technical component related to MI efficacy.

The Two Phases

The first phase involves resolving the adolescent’s ambivalence and building his or her motivation for change (Miller & Rollnick, 2002). If the adolescent is already contemplating change then the therapist will work on bringing out motivation from within the client. Therefore, to begin the phase the therapist asks the client how important

it is to change and how confident he or she is in making that change (i.e. assessing the adolescent's readiness and self-efficacy). This will give the therapist the information needed to structure the session. For example, adolescents who believe that it is not important to change, but believe they could if they wanted to, will have different needs than adolescents who have the motivation to change but lack the self-efficacy needed to. Miller and Rollnick (2002) suggest applying O.A.R.S. in such a way as to direct the client toward seeing the discrepancy between actions and values, thus eliciting the negative outcome expectancies related to substance use. Then, once a discrepancy has been established change talk will inevitably ensue moving the client toward planning for change. In other words, enhancing self-efficacy and positive outcome expectancies related to abstaining will make the adolescent more ready to abstain.

The first phase ends and the second phase begins with enhancing the adolescent's confidence (increasing self-efficacy to abstain) as he or she becomes ready for change. The start of phase two includes the recapitulation of the adolescent's situation. This will close out phase one and recount to the adolescent the reasons for his or her desire to stay away from substances. Next, the therapist asks an open-ended key question regarding the next step that the adolescent wishes to take toward their goal. No matter what answer the adolescent gives the therapist will meet it with reflective listening. During the second phase the therapist shifts the approach from encouraging the importance of change and self-efficacy to strengthening the commitment to the change plan (i.e. eliciting positive outcome expectancies related to abstaining). There are several cues that the therapist can take as the adolescent's readiness for change. These cues include; decreased resistance, decreased discussion about the problem, resignation, change talk, questions about change,

envisioning change, and experimenting with change. The final steps in phase two include, setting goals, considering change options, arriving at a plan, and eliciting commitment.

As detailed above, MI has various components and approaches behavior change from different directions, yet it still remains flexible so that it can meet the needs of individual adolescents from different backgrounds and different problems. However, there are specific aspects of MI that make it a particularly efficacious approach for adolescents with substance use difficulties.

Adolescents and Motivational Interviewing

There are several reasons why MI would be especially suited for use in an adolescent population (Atkinson & Ames, 2007). Adolescents may be ambivalent to change because they are often referred by a third party (i.e. juvenile court or parent), or they would like to maintain a peer status related to substance use, or their developmental stage does not permit them to fully grasp the consequences of their behaviors and thus their outcome expectancies are unrealistic. The non-confrontational, rolling with resistance stance of the intervention is also in line with the developmental position of the adolescent, who is trying to assert his or her autonomy. There is substantial empirical evidence that MI (when applied correctly) improves outcomes in adolescents with substance use issues (Barnett, et. al., 2012; Jensen, et. al., 2011).

Empirical literature for MI and adolescents. Jensen and colleagues (2011) examined 21 studies to test the effectiveness of MI on an adolescent population. All of the studies included used adolescents between the ages of 12 and 21. Also, each study had an experimental and control condition with sufficient data reported in order to compute effect sizes. Various outcome measures for MI's impact on substances were

used; 12 studies looked at marijuana use, 12 studies looked at alcohol consumption, seven studies looked at tobacco use, six studies also included ‘street drugs,’ and six studies looked at poly-substance use. Most studies included participants from the community (n=17), few studies had a clinical sample.

The results of the meta-analysis indicated a significant aggregate effect size. The effect size was small but the MI intervention had a statistically significant impact on substance use in adolescents. The authors note that effect sizes remained significant when including follow-up data from studies that did follow-up assessments, indicating that the impact of MI remains after the intervention. Several questions remained unaddressed in this analysis that warrant some attention, such as; how assessment feedback given during an intervention impacts the effectiveness of MI, if MI interventions impact the social cognitive theory mechanisms in adolescents, how single session versus multiple session MI impacts intervention effectiveness, and also how therapist training in MI impacts the effectiveness of the intervention.

A more recent meta-analysis included some information on these questions. The investigators collected and analyzed 41 studies on how MI impacts adolescents with substance use difficulties (Barnett, et. al., 2012). For a study to be included in this sample, the participants were required to have a mean age of 18.5 and the results needed to quantitatively reflect an MI interventions’ impact on some kind of substance use.

This study specifically separated the results from MI studies that included feedback and did not include feedback. Feedback in MI interventions is used to inform the adolescent about the consequences of his or her behavior, thus eliciting ‘change talk’ or thought about outcome (Rosengren, 2009). Due to the developmental position of the

adolescent (developing autonomy) it is debated whether this is an effective technique with adolescents, as it can often result in resistance and confrontation. In this analysis, the investigators found that interventions that did not include feedback (n = 13) showed better results than MI with feedback (n = 26). However, it is not a statistically significant difference. They note that many of the studies in this analysis were conducted with a population of college students, who may be more receptive to feedback than younger adolescents.

Another question addressed in this analysis was how MI interventions impact readiness. Readiness to abstain is equivalent to the social cognitive theory mechanism of having motivation toward abstaining. They reported that 12 studies included measures of readiness. They indicated that seven of the 12 studies reported that MI had a positive impact on readiness to abstain from substances. These results suggest that MI impacts 'readiness' sometimes. However, it is important to investigate this impact further.

Wachtel and Staniford (2010) reviewed 12 MI (for adolescent drinking) studies for long-term effects. The adolescents in all of the studies were aged between 18 and 25. To be included in the analysis, the studies needed to have a control group and assign participants randomly. In other words, all of the studies included in the analysis were randomized control trials. The way in which MI was delivered varied within the sample of studies. Some studies had a single session MI intervention meant to enhance treatment engagement, others had two sessions of MI meant to be brief interventions for alcohol misuse. There were others that delivered the MI intervention in groups instead of individually. This review compared two other brief intervention studies of a computer scenario and an audio scenario about alcohol abuse to MI. Consistent with previous

research, the MI interventions had greater treatment effects than that of the other two brief interventions. The outcomes that MI was accredited with were reduction of frequency of consumption of alcohol, the reduction of drunk driving incidences, the reduction of alcohol related injuries, and also the reduction of binge drinking among college students (college students are considered at-risk for binge drinking difficulties).

A meta-analysis evaluating MI in a college student population noted promising results with alcohol (Larimer & Cronce, 2007). Specifically, positive outcomes included MI being related to students pursuing additional treatment for drinking at follow-up, increased cognitive dissonance, and reduced use directly following the intervention. The analysis also summarized a study that compared two-session MI to three-session MI and skills workbook intervention. Results indicated that the three-session MI had higher positive alcohol reduction outcomes compared to the other intervention conditions. Another study in the analysis found no difference between a two-session MI and a feedback session when comparing reduction in the number of drinks consumed. They noted that studies which included students who were mandated to receive treatment had larger effect sizes studies that used volunteers from psychology classes. There was a bigger effect for students who had more drinking problems, as opposed to students who signed up for a study to get a credit for class. Overall, Larimer and Cronce concluded that MI was more effective than most other interventions used to reduce drinking in college.

Motivational Interviewing has also been used in a psychiatric population of youth who presented with co-morbid disorders with substance use (Goti, et. al., 2010). In this population, MI was delivered in a single 60-minute session in which the counselor followed a structured outline that included a conversation about the problems and risks of

substance use. Results from this study showed that the intervention was not effective in reducing substance use. However, analysis of the method of this intervention showed that it did not adhere to the principles of MI. When delivering an intervention in the spirit of MI the therapist should be attempting to elicit the adolescent to talk about the problems and risks associated with substance use. If the therapist becomes the authority on what should be done, the MI counseling relationship is negated and the intervention can no longer be called an MI style intervention. Therefore, the major limitation of this study is that an MI intervention was not used.

A similar study used an intervention to attempt reducing the amount of tobacco use among a population of adolescent psychiatric patients (Brown, et. al., 2009). The treatment condition consisted of two 45 minute MI sessions during the time the participant was hospitalized, also comprehensive self help materials, and up to six telephone sessions following hospitalization. The first two sessions consisted of:

a discussion concerning the pros and cons of smoking and of quitting smoking.

The therapist then provided feedback regarding the influence of [the adolescent's] social network on smoking, level and symptoms of nicotine dependence, smoking norms and attitudes towards smoking among adolescents, and the cost of smoking. The second session began with a review of the previous session.

Feedback was provided to participants concerning the impact of smoking on appearance/attractiveness, their carbon monoxide concentrations, their pulmonary symptoms, and indices of their lung functioning... (pg. 5)

The control group in the study received brief advice on quitting smoking and limited materials. There was no difference between the control and the groups for

smoking cessation or decreased smoking. The intervention delivered was not in the MI style. This intervention is described as a brief advice technique. It is not likely adolescents in psychiatric hospitalization are concerned with their lung functioning. Rosengren (2009) states “Feedback is not MI, nor is feedback required for a session to be MI.” (pg. 98). Barnett and colleagues (2012) noted that feedback may not have a positive impact on adolescents.

However, this study also measured the self-efficacy (specifically, the participants’ self-efficacy in being able to refuse substances) of the participants. The participants’ self-efficacy to refuse smoking in certain situations was measured at baseline, upon discharge, and also during follow-up. The investigators noted that higher self-efficacy at discharge was significantly related to the reduction of tobacco use at follow-up, even though there was no significant difference between the brief-advice or MI groups for increased self-efficacy or smoking. This is further evidence that self-efficacy is a mechanism of substance use behavior. However, it is still unclear if MI interventions have an impact on this mechanism.

Stein and colleagues (2006) looked at how a MI intervention impacted the frequency of driving under the influence after the release of adolescents who were incarcerated. In this study, the participants were between the ages of 14 and 19 and had been sentenced to a juvenile correctional facility for several months. The adolescents attended two sessions of MI (90 minutes and 60 minutes respectively) during the beginning of their stay in the facility. Adolescents in the control condition received two sessions of relaxation training therapy. As compared to the control group, the participants in the MI group had a 89.1% reduction in driving under the influence of alcohol, and a

74.2% reduction in passenger-ing in a vehicle being driven by some one who has been drinking.

Two studies have also examined the at-risk population of homeless children and the impact of an MI intervention on their substance use. (Baer, Garrett, Beadnell, Wells, & Peterson, 2007; Baer, et. al., 2008). The first study followed the general model of MI and included four short sessions in which the counselor organized feedback on substance use into a colorful booklet and let the participant choose what topic about substance use to talk about in the sessions. The counselors were not trained in MI. Results from the analyses concluded that there was no change from baseline substance use among the sample.

In the second study by Baer and colleagues (2008), the participants received a modified version of MI which included four sessions that averaged less than 30 minutes each. In this study, the counselors were formally trained in MI by a certified trainer. Substance use was measured by days of abstinence per month. The results indicated that days of abstinence increased from baseline (average = 7.5 days) to three month follow – up (average = 10.6 days) indicating a significant change from baseline. It may be that formal training by a certified trainer of MI contributes to the efficacy of the intervention.

Also, the investigators noted a significant correlation between strength of change talk and change in substance use rate ($r = .40$). These results indicate that by increasing positive outcome expectancy related to abstaining from substances (i.e. change talk) better outcomes can be achieved. It also speaks to the possibility that MI can increase positive outcome expectancies, as theorized. The next section reviews more studies that

show how MI can impact the social cognitive theory mechanisms that lead to positive behavior.

MI and social cognitive theory mechanisms. It is understandable that much of the research on MI is concerned with its efficacy as an intervention. However, there is little informative research on the reasons why it works. The way MI impacts motivation, self-efficacy, and outcome expectancies is largely unknown and there is less known about the at-risk adolescent population. In order to be able to tailor motivational interviewing interventions to the client it is important to know how it impacts the mechanisms that lead to positive behavior.

Thush, Wiers, and Moerbeek (2009) hypothesized that a single 30 minute session of MI would increase motivation to change and also increase negative expectancies related to alcohol use within a sample of at-risk adolescents from low income backgrounds. The result indicated that the hypothesized effect could not be confirmed. However, the intervention was delivered in one 30 minute session. It is likely that this was insufficient to yield significant change.

Patten and colleagues (2008) studied the impact of MI on readiness and self-efficacy among a sample of adolescents who would like to reduce or stop their tobacco use. Participants between the ages of 18 and 11 volunteered for four sessions of a brief, manualized office intervention, delivered in the MI style (though MI style is not recommended to be manualized (Miller & Rollnick, 2009)). Measures of readiness and self-efficacy were given at baseline then at six, four-week intervals. They reported that all of the adolescents reported higher motivation and more self-efficacy as the intervention progressed. However, there are several design limitations to this study. First, there was no

control group so it is unclear if it was the intervention effect, or a time effect. At baseline, 75% of the participants reported that they would “greatly” like to stop using tobacco, thus their readiness and self-efficacy might increase without intervention. Also, this population is not generalizable to at-risk population as it was a general community sample.

In another study, self-efficacy to refuse and both positive and negative expectancies were measured in students who used tobacco (Erol & Erdogan, 2008). The participants were aged 13 to 20. This study did not use a control group. However, the MI intervention that was delivered lasted for five sessions, each being 45 minutes in length. The investigators noted that many participants asked for more sessions. In this study, students who voiced more readiness within the sessions had higher self-efficacy and positive outcome expectancies related to quitting smoking.

Conclusion

In summary, there is a lack of well designed research which investigates these mechanisms in adolescents who use substances. It is important to note that there is some evidence that MI has an impact on these mechanisms. There is substantial evidence that MI interventions improve substance use outcomes in adolescents. However, the current empirical base for the mechanisms that make MI effective remain largely invalidated. It is the purpose of the current study to investigate the impact of MI on the social cognitive theory mechanisms. In order to tailor interventions to the at-risk population it is important to know how MI impacts the mechanisms in this population.

To be able to investigate the current questions, a multiple baseline design will be used. This method will allow the researcher to analyze the specific ways in which MI

affects the social cognitive theory mechanisms. The at-risk population of adjudicated adolescents within an alternative school setting will be examined in this method, thus significantly adding to the body of literature in this population. The following chapter will discuss the method of this study in detail.

Chapter III: Methods

Methodology

The purpose of this study was to assess the efficacy of a Motivational Interviewing (MI) intervention on increasing motivation and self-efficacy to abstain from using substances and increasing the positive outcome expectancies related to abstaining from substances in adolescents. The theoretical basis of MI as an intervention is an indicator of its efficacy (Miller & Rollnick, 2004). Also, the evidence base around MI substantiates its efficacy with youth (Barnett, et. al., 2012; Jensen, et. al., 2011; Watchel & Stanford, 2012). However, little is known about how it works and with exactly whom it works. There is conflicting evidence surrounding the impact MI has on the mechanisms in social cognitive theory (Erol & Erdogan, 2008; Patten, et. al., 2009; Thush, Weirs, & Moerbeek, 2009) and also, if it can be effective in the population of adjudicated at-risk youth. It is important to analyze the specific impact of MI on the mechanisms within this population.

Adjudicated adolescents who are in an alternative school placement are a population warranting examination because the students are more at-risk for substance use than their peers who have not been adjudicated. (Arthur, Hawkins, Pollard, Catalano, & Baglioni, 2002). Previous studies have recruited participants from the general population (Larimer & Cronce 2007) or adolescents who are in psychiatric hospitals (Goti, et. al., 2010) neither setting can provide participants who are directly relatable to adjudicated adolescents in alternative school placement.

The efficacy of Motivational Interviewing (MI) intervention was evaluated using a single subject design across subjects. This research design was the most appropriate, as

it allowed for greater control and detailed measurement of the MI intervention in a school setting. The participants completed at least three baseline points and then began and completed treatment without interruption. Kazdin, (1982) notes that single-subject design research is particularly useful to the clinician who “is not concerned with presenting a standardized technique, but providing a treatment that is individualized to meet the patient’s needs in an optimal fashion” (p.13) Motivational interviewing is particularly suited to this research design because it is best implemented in a flexible, natural setting. This design can be implemented within a natural setting, thus the results from the study will be more generalizable to a clinical setting making them clinically significant. It also allows for the close examination of how individual participants react to the intervention, revealing information about what participants do not respond to. Due to the comparatively small scale of single subject research as compared to large analyses, the procedures within this methodology are more efficient in terms of cost, yet still allow for the evaluation of the efficacy of the intervention (Horner, et. al., 2005).

By measuring the variables within each participant before the intervention is applied, gives researcher a baseline with which to compare the impact of the intervention. The reproduction of the same impact over several participants will display a causal relationship between the change in the dependent variables and the performance of the intervention. Specifically, a relationship between the dependent variables and the intervention can be inferred when a baseline is established and that baseline changes when the intervention is implemented (Richards, et. al., 1999). This relationship strengthens when the change occurs across several participants thus enhancing external validity.

Participants

Following approval from the Duquesne University Institutional Review Board, participants were recruited from a community-based charter school for adjudicated adolescents. Fourteen participants were identified by the school psychologist and a total of six participants returned parent permission forms. Two participants dropped out of the study in the first week due to illness (one had surgery on her knee and was absent for three weeks) and suspension (10 day suspension for fighting). A 20% attrition rate was expected. The remaining four participants completed the study in its entirety. All participants were between the ages of 14 and 17. A minimum of three participants were needed to assure that there was sufficient data with which to complete a visual analysis to ascertain if there was a change in the in the dependent variable.

All participants had indicated drug use in the 30 days prior to the beginning of the study on their biopsychosocial interviews, which had been conducted by the school psychologist and her interns. Following biopsychosocial interviews, potential participants were asked if they would be interested in participating in this study. Students were excluded from participation based on age (below 14 or above 17), an absence of past drug abuse, and having a previous diagnosis of dependence, personality disorder, or intellectual disability. All participants attended the charter school five days per week and experienced similar classroom environments.

Participant 1 was a seventeen-year-old biracial male who reported marijuana, alcohol, and prescription drug use. During the intervention, he indicated daily marijuana abuse, weekly alcohol use, monthly abuse of Adderall, and recent past abuse of “Zanz.” He stated that he was unsure if he had bought Xanax prescription drug, or a similar

benzodiazepine medication. Throughout the first seven weeks of the study Participant 1 also participated in the afterschool integrated program, during which he attended cognitive behavioral group therapy for anger management, six days per week. During the last week of data collection for Participant 1, he was transferred to juvenile detention for skipping this afterschool program for several days. His final survey was completed at the detention facility.

Participant 2 was a sixteen-year-old biracial male who reported daily abuse of marijuana and Xanax, and weekly use of alcohol. Participant 2 did not participate in any of the therapy going on at the charter school. He was taking remediation and special education classes to catch up to the eleventh grade. He indicated that he did not take any benzodiazepines for his second MI session.

Participant 3 was a fifteen-year-old Caucasian female who reported marijuana abuse several times per-week, weekly alcohol use, daily nicotine use, and monthly Xanax use. She was participating in weekly anger management group therapy at a separate treatment center. However, she was not participating in any of the therapy offered by the school.

Participant 4 was a seventeen-year-old African-American male who indicated daily marijuana abuse, monthly alcohol use, and monthly abuse of “Zanz.” He was not participating in any of the therapy offered by the school, however, he indicated that he would like to start weekly individual therapy, following the end of this study. During the study, a friend of his was shot and killed, he indicated that this elevated his drug use throughout the maintenance phase.

Measures

Demographics

Demographic information was obtained from the participants during the first data collection session. The demographic questionnaire included: sex, age, race, and drug use in the past 30 days.

Rollnick Readiness Ruler

Motivation, within social cognitive theory, is conceptualized as a cognitive determinant of behavior (Bandura, 1986). Research indicates that as motivation to abstain from substances increases, it is less likely that substance use behavior will occur (Chung et. al., 2011; Joe et. al., 1998; Slavet et. al., 2006). Motivation to refrain from using substances will be measured with the Rollnick Readiness Ruler (Center on Alcoholism, Substance Abuse, and Addictions, 1995).

This is a continuous instrument specifically developed to measure progress within clients who are receiving an MI therapy. This measure of motivation will link assessment to intervention. Specifically, as the intervention progresses, the motivation to abstain is hypothesized to increase.

The participant is given a piece of paper with the numbers one through 10 printed across it and asked to rate how ready he or she is to do a certain behavior. The directions for this ruler state “On the ruler shown below, please circle how ready you are to avoid substance use”. If the participant circles a number closer to one, it would indicate less motivation, and closer to 10 would indicate more motivation. There is statistical evidence for the clinical validity of the readiness ruler. There is also evidence for its concurrent

and predicative validity in substance users, and specifically its predicative validity with adolescent substance users (Maisto, et. al., 2011).

When referring to psychometric testing, ‘reliability’ is the term used to describe how consistently an instrument measures a certain construct. In other words, knowing your instrument is reliable means that you can trust it to measure the same construct even though conditions have changed. Thus, if conditions have not changed, then the measure should give you the same results over time. (McMillan & Schumacher, 2010) The readiness ruler measures the same construct with one question, over time this will not change.

To state an instrument is valid indicates that it is giving you information on exactly what you want it to be measuring. Within criterion validity there are two types of validity; predictive and concurrent. Predictive validity is how predictive of the future an instrument can be. In other words, if the ruler has predictive validity, scores will give information about future behavior related to the construct of motivation (Urbina, 2004). Maisto and colleagues (2011) assessed the predictive validity of the ruler (on adolescents who used substances aged 14-18) by comparing the results to actual behaviors. They also compared the ruler’s validity to other measures of motivation to abstain from substances. Their results indicated that the readiness ruler scores showed the highest and most consistent correlation to actual behavior. Specifically, higher scores on the readiness ruler correlated to how many days of abstinence the participant reported at the 6-month follow up.

Drug Use Resistance Self-Efficacy Scale

Self-efficacy is the belief that one can achieve what he or she would like to achieve (Bandura 1977). This construct is important because research indicates that if the individual believes that he or she can do something, that behavior is more likely to occur (Oei, et. al., 2010). For this study, the specific self-efficacy belief that will be measured is the participant's belief that he or she can resist or refuse substances. This construct will be measured with the Drug Use Resistance Self-Efficacy (DURSE) Scale (DURSE; Carpenter & Howard, 2009).

The DURSE scale is a questionnaire with 24 items that asks participants how 'sure' he or she will be able to do something (e.g. "How sure are you that you can refuse if a friend offers you alcohol at a party and you do not want it?") The participants rate how sure they are on a likert-type scale of the letters 'A' through 'D', a) Not sure at all; b) Not very sure; c) Pretty sure; and d) Definitely sure. The letters correspond to the numbers one through four and are summed for the total scores on separate scales within the DURSE. There are three separate subscales on the DURSE; alcohol, tobacco, and marijuana. Higher scores on the DURSE scales indicate higher self-efficacy.

Carpenter and Howard (2009) reported high internal consistency for the DURSE scales. High scores are scores closer to 1.00. For females, aged 11-13, the internal consistency for the total scale was 0.98 and for the males it was 0.97. This measure was developed specifically for use with an adolescent population (Carpenter & Howard, 2009). For construct validity the scores from the DURSE subscales were compared to the scores from two similar measures; the Drug Refusal Scale (DRS) and the Refusal Skills

Questionnaire. The measures were moderately correlated, indicating that the instruments measure approximately the same construct.

The DURSE was slightly adapted for the use of this study. The three separate subscales were combined to improve the reliability of the questions to the participants. Each scale would ask the same eight questions about a different substance, for example “Could you refuse if a friend offers you a cigarette at a party when no adults are around and you do not want it?” and “Could you refuse if a friend offers you marijuana at a party when no adults are around and you do not want it?” These were combined to say “Could you refuse if a friend offers you drugs or alcohol at a party when no adults are around and you do not want it?” Due to the internal consistency being relatively high (.97 and .98) it is likely that all of the subscales measured similar constructs.

Cognitive Appraisal of Risky Events Scale - Revised

The outcome expectancy construct refers to the expectations of the adolescent surrounding the consequences of using or not using substances. It is common in the literature about substance use outcome expectancies to measure negative and positive consequences of using. However, more relevant to social cognitive theory are the outcome expectancies surrounding abstention from substances, since that is what you would like your client to do. Positive outcome expectancies have been indicated as more predictive of subsequent behavior in adolescents than negative outcome expectancies (Martino et. al., 2006; Nikoletti & Taussig, 2006; Urban & Demetrovics, 2010)

This study adapted a measure generally used to assess the positive and negative outcome expectancies of using substances called the Cognitive Appraisal of Risky Events Scale - Revised (CARE-R) which is a more recent version of the CARE, developed by

Fromme, Katz, and Rivet (1997). This measure was prepared for use with adolescents and uses language that is relevant to the demographic that this study would like to utilize.

The adapted version had 24 questions related to the positive outcome expectancies of using substances and avoiding substances. These are the Benefits scales for both illicit drug use and drinking behavior. The adolescent is asked how likely it is that he or she will experience positive consequences related to using substances on a Likert type scale. The scale ranges from 'Not At All Likely' to 'Extremely Likely' on a number scale of one through seven.

The measure also includes past frequency and future involvement scales. The authors suggest that only one of the scales be used per participant. These are less relevant to this study and will not be used. When testing the factor structure of the CARE-R the authors broke up the measure into its distinct scales of "expected risk," "expected benefit," and "frequency of use" and within these scales they conducted an exploratory factor analysis.

Through the exploratory analysis they found the same six factor solutions loading above .40 for all three scales. The factors included; drug and alcohol use, aggressive behaviors, risky sexual activity, heavy drinking, high risk sports, and academic/work behaviors. The Cronbach's alpha coefficients indicated adequate internal reliabilities for each of the factors. Several items were deleted through this process. This indicates that each of the scales are individually sufficient in measuring a specific construct. Thus, using one scale (benefit scale) will be sufficient to measure the expected benefit outcome expectancy of drug use and avoidance.

Next, the stability of the factor structure was examined by conducting a confirmatory factor analysis through structural equation modeling techniques. The six-factor model fit the item analysis data after dropping two more items. The internal reliability for the items in each factor (in each scale) ranged from .64 to .90 with the coefficient alphas (within the expected benefit scale) for illicit drug use equal to .82 and heavy drinking equal to .84. In other words, the items within these factors mostly measure the same thing.

To establish the test-retest reliability and the construct validity of the CARE-R another study was conducted. Within this study 98 undergraduate students (average age = 19) took the CARE-R once per week for two weeks. Test-retest correlations for the expected benefit scale ranged from .58 to .79. For construct validity the authors compared the CARE-R scores to measures of social conformity and impulsive behavior. They hypothesized that the correlations between the CARE-R expected benefit scale and the social conformity scale should be negative and the correlations between the CARE-R expected benefit scale and the impulsive behavior scale should be positive. This was true for both illicit drug use and heavy drinking subscales. Though, of course, the correlations were not very high. Thus, it can be assumed that the scores for these subscales within the expected benefit scale give accurate measurement of adolescent's perceived amount of benefit from using substances. When examining the data for criterion validity, Fromme and colleagues (1997) noted that the data from the expected benefit scale accounted for the greatest amount of variance in the frequency reported for drug use, heavy drinking, and aggression. This is consistent with previous research findings that positive expectancies are predictive of substance use behavior.

Katz and colleagues (2002) used the CARE-R in a population of college students to examine the effects of personality traits and outcome expectancies on substance use. Again, positive outcome expectancies, from the expected benefit scale, about drinking and drug use was predictive of future substance use. Expected risks, or negative outcome expectancies were slightly correlated with heavy drinking, however, only positive outcome expectancies were correlated with illicit drug use.

This study used the items from the expected benefit scale about heavy drinking and drug use to find adolescents' expected benefits, or positive outcome expectancies, about abstaining from substances. The directions and questions of this scale were then slightly modified to assess the positive outcome expectancy of using substances also.

Therefore, a total of 24 questions were used to assess the positive outcome expectancy of both abstaining from and using substances. Social cognitive theory indicates that positive outcome expectancies are more predictive of behavior, this has been true in a clinical sense. This study measured the impact of a motivational interviewing intervention on both the positive outcome expectancies of using and of not using substances.

Research Design

Dependent Variables – The dependent variables in this study are the participants' scores from the measures of motivation, self-efficacy, and outcome expectancy.

Independent Variable – The independent variable in this study will be the MI intervention.

Design

Single Subject Design. A single subject multiple baseline design was utilized to complete this research (Richards, et. al., 1999). This design is also called an A-B design. It was conducted across participants, with four participants. This design is called a multiple baseline design because data is collected over several baselines. In this study, data was collected to establish a baseline of responding for each participant. The research was conducted in the same setting, with similar participants, while addressing the motivation, self-efficacy, and outcome expectancies of each participant.

Preliminary baseline data were collected at the same time for each participant, then the intervention phase began for the first participant, while baseline collection continued for the subsequent participants, then intervention phase began for the second participant, while the baseline phase continued for the subsequent participants, and so on until intervention was complete for each participant. Introducing the intervention in this staggered manner allows the researcher to assume that baseline will remain the same without the introduction of the intervention. Thus, changes in the dependent variables can indicate a functional relationship between the dependent and independent variables.

An intervention maintenance data collection phase occurred for four weeks following the intervention's end for each participant. The maintenance phase is meant to deduce if the intervention effects are maintained over time. By keeping extraneous variables constant, such as time and environment, the change in the dependent variables can be attributed to the independent variable and no other extraneous variables. These data resulted in several graphs that show the interaction of the independent variable on the dependent variables. From these graphs the intervention effects can be interpreted.

Threats to internal and external validity

When a research study has internal validity it means that a cause and effect can be attributed to the interaction between the independent and dependent variables. When threats exist to internal validity they must be satisfied or avoided as much as possible. In his work, *Single-case Research Designs: Methods for Clinical and Applied Settings*, Kazdin (1982) details several threats to internal validity; these are historical events, selection bias of participants, maturation, pretesting (also called testing), instrumentation, statistical regression, attrition (also called mortality), and diffusion of intervention. Other possible threats to internal validity include; subject effects and experimenter effects (McMillan & Schumacher, 2010).

For threats attributed to history and selection bias, the participants being recruited were from the same setting and had similar backgrounds. Intervention replication is also not a significant threat to the internal validity of this study as all of the participants received the intervention independently. In other words, each participant will only be receiving one intervention. Maturation is a term meant to describe the natural maturing of the participants in the study. Though the duration of this study was relatively short, a small amount of maturation could still impact it. Pretesting and instrumentality are not significant threats to the study, as the multiple baseline design of the study will show the impact of the intervention.

Statistical regression, or regression to the mean, is a small threat to the study. The participants recruited are at-risk and will naturally have lower motivation, self-efficacy, and outcome expectancies. During the course of the study it was not apparent that any other participant's responding regressed to the middle. Attrition was not threat to the

internal validity of the study. Diffusion of the intervention was not a threat to the study as the participants were taken out of classes for the intervention without other participants knowing of their involvement.

Additionally, subject effects could have impacted the internal validity as the participants were aware that they are in a study and thus may have changed their responding based on what they think the experimenter wants to see. Experimenter bias was not a threat as the experimenter was aware of this threat and made precautions to remain objective.

When a study has external validity, it means that external factors had little or no impact on the causal relationship between the dependent and independent variables. Two categories exist for external validity (McMillan & Schumacher, 2010). The first category of external validity is termed population effects. This study is meant to explore a small category of individuals (at-risk youth in school facilities) and cannot be generalized to the population at large. The second category is ecological effects. The study is being implemented in the most naturalistic setting possible for the participants. Thus, the ecological validity of this study is high.

Fidelity and Training in the Intervention

Interventionist training is very important to the fidelity of the intervention (Baer, Garrett, Beadnell, Wells, & Peterson, 2007; Baer, et. al., 2008). An interventionist must be familiar with the basic concepts of the MI style and have practice delivering them. This will make the interventionist more able to successfully build rapport and also evoke ‘change talk’ within the client while exploring ambivalence related to substance use.

This interventionist has had over 50 hours of training in the MI style of counseling. She has participated in two full day sessions of MI training with credentialed trainers. She has also taken several online classes on MI counseling, including an MI class adapted for adolescents. The interventionist has read extensively on the background, history, and development of MI from the seminal writings of Miller and Rollnick (2005 and 2009). She has also read and implemented several separate curricula developed to include MI techniques (Sampl & Kadden, 2001; Sobell & Sobell, 2011). She has used MI in adolescent group and individual counseling sessions within a school facility over the past three years. She has also developed and delivered seminars on beginning concepts of MI.

The Motivational Interviewing Treatment Integrity (MITI) scale was also used to ensure MI session fidelity (MITI 3.1.1; Moyers, et. al., 2010). This scale was adapted from the longer and more involved Motivational Interviewing Skills Code for it to be more practical for clinicians to use. This measure has sufficient reliability and validity. It gives scores for how well MI skills were applied in treatment. The interventionist is rated globally in five areas, these are; evocation, collaboration, autonomy/support, direction, and empathy. The interventionist is also rated behaviorally in the kinds of questions asked and also MI adherent and non-adherent advice giving. This scale was used by the interventionist to assess her skills in delivering the MI sessions to the participants. Case notes were used to assess her adherence to the MI style during the intervention sessions. Detailed case notes were recorded directly following the sessions and all MI techniques used were recorded in the notes. All of her sessions had moderate to high global ratings and sufficient behavior counts in both asking questions and giving advice.

Procedure

Participants were identified by the school psychologist. Once identified by application of study criteria, the guardians of the potential participants were given consent forms and explained the study. Following consent from the guardian, the student was approached to give his or her assent to participate. Each participant was informed that he or she may quit the study at any time. Following the gathering of participants and the signing of the consent and assent forms, the participants completed baseline testing.

Baseline

At the initial meeting with the researcher all four of the participants completed the demographics questionnaire as well as the measurement packet (consisting of: The Rollnick Readiness Ruler, the adapted DURSE, and the adapted CARE-R). Baseline data collection began the week of January 6th. Weekly data collection sessions lasted from 15 to 20 minutes. During each data collection session the participant was given the measurements packet and asked to complete it based on his or her thoughts about substances. The participants were informed that sometimes their thoughts about substances can change from week to week, which is why they will fill the packet out several times, to see if and how their thoughts change.

Each participant began baseline in the same week. Individual sessions were scheduled to collect the baseline assessments so that the participants did not have the opportunity to openly discuss the testing, thus improving the internal validity of the study. The first participant (Participant 1) completed baseline after three data collection sessions and began intervention the week of January, 29th 2015. The second participant completed four weeks of baseline assessment then began intervention the week of

February, 4th 2015. The third participant completed five weeks of baseline assessment then began intervention the week of February, 10th 2015. The fourth participant completed six weeks of baseline assessment then began intervention the week of February, 19th 2015. Collecting baseline assessments in this staggered manner allowed visual analysis of the data to confirm that a change in the scores of the measures was due to the intervention.

Intervention

During the intervention phase of the study the participants received one 50 minute session of an MI intervention per week for two weeks. Two sessions are recommended for the brief intervention (Motivational Interviewing, 2010). The interventionist has had extensive training and experience in this counseling style. Miller (2009) noted that better results have been documented from studies where the MI interventions were not manualized compared to manualized interventions. However, there are guidelines to follow when delivering an MI intervention (Rosengren, 2009). Please see the preceding chapter for a detailed explanation of the MI counseling guidelines. All interventions were conducted in the MI style. Data collection continued each week while the participants received the intervention, in order to record any changes that took place due to the first or second session. Measurement packets were given to the participant following each MI session.

Maintenance

The maintenance phase of the study was similar to the baseline phase. Once the intervention phase was complete for the first participant, he continued to complete the measurement packet for the following four weeks. Each participant completed four weeks

of the maintenance phase. These data served as follow-up, to observe if the changes in the dependent variables continue once the intervention was completed.

Data Analysis

Graphing Data and Visual Analysis

Due to the nature of single subject research designs, visual analysis is often used to determine the impact the independent variable had on the dependent variable (Richards, et. al., 1999). This method allows the researcher to see the changes in the dependent variables both across the phases and also within the phases of the study. It is important to see changes in the dependent variables within phases to detect what is happening during baseline, intervention, and maintenance. This analysis is done partially so that changes across phases can also be perceived. Changes across phases are what ultimately decide the results of the study. Improvement following the introduction of the intervention should be evident in the graphed data. The dependent variable was graphed on the y-axis while the intervention phase (time) was graphed upon the x-axis. Due to the relatively large numbers that will be produced from the measures, the data was graphed in equal intervals so that changes can be seen, but not to make them appear larger or smaller than should be interpreted (Richards, 1999).

There are several aspects of the data to pay attention to while interpreting changes within and across phases (Richards, 1999). The first is the amount of data points within the phase. The amount of data points must be sufficient to show how the dependent variable is performing within that phase. Some studies will need more data points and others will need fewer depending on how variable the data will be. It is not likely that the adolescents' thoughts about substance use will change substantially from week to week.

Therefore, three data points were needed to establish an accurate representation of the performance of the dependent variables.

The level of the dependent variable is also important to consider. The level is the term for how high a data point is along the y-axis. An immediate change in the dependent variable should be seen as a jump or drop in the data along the axis. The mean is also used as an indicator of level within phases. The mean of the data points within a phase are calculated and compared across phases. When looking at the level across the phases, an immediate change in level (or latency of change) when going from baseline to intervention, or intervention to maintenance, is a visual indicator that the independent variable is having an impact on the dependent variable.

When analyzing visually graphed single subject data, the trend of the data is also important to interpret. This can be seen when the data shows a clear and steady indication of where it is going (if it is increasing or decreasing). It is important to consider these trends when they occur both within and across phases. If a change in trend occurs directly after a phase change it is a general indicator that the independent variable is having an impact on the dependent variable, this is the latency of change.

In summary, several criteria were employed in the visual analysis of the graphed data. The first was the means of the data within and across phases, second were the levels of the data across phases, also the trend of the data across phases, and the latency of change following the separate phases. Through these methods, the impact of the intervention was analyzed.

Research Questions and Hypotheses

Research Question 1: Does a MI intervention significantly increase motivation to reduce or abstain from substances in adjudicated adolescents within a school setting?

Hypothesis 1: A MI intervention will significantly increase the motivation to reduce or abstain from substances in adjudicated adolescents within a school setting.

Analysis of Research Question 1: A visual analysis of graphed data was conducted to assess the change in motivation from baseline, to intervention, to maintenance phase. The dependent variable (motivation) was collected via the Rollnick Readiness Ruler (Motvational Interviewing, 2010). The independent variable was the MI intervention.

Research Question 2: Does a MI intervention significantly increase self-efficacy to refuse substances in adjudicated adolescents within a school setting?

Hypothesis 2: A MI intervention will significantly increase self-efficacy to refuse substances in adjudicated adolescents within a school setting.

Analysis of Research Question 2: A visual analysis of graphed data was conducted to assess the change in self-efficacy from baseline, to intervention, to maintenance phase. The dependent variable (self-efficacy) was collected via the DURSE (Carpenter & Howard, 2009). The independent variable was the MI intervention.

Research Question 3: Does a MI intervention significantly increase positive outcome expectancies related to reducing or abstaining from substances in adjudicated adolescents within a school setting?

Hypothesis 3: A MI intervention will significantly increase positive outcome expectancies related to reducing or abstaining from substances in adjudicated adolescents within a school setting.

Analysis of Research Question 3: A visual analysis of graphed data was conducted to assess the change in positive outcome expectancies related to abstaining from substances from baseline, to intervention, to maintenance phase. The dependent variable (outcome expectancies) was collected via the Cognitive Appraisal of Risky Events Scale- Revised (CARE-R). The independent variable was the MI intervention.

Research Question 4: Does a MI intervention significantly decrease positive outcome expectancies related to using substances in adjudicated adolescents within a school setting?

Hypothesis 4: A MI intervention will significantly decrease positive outcome expectancies related to using substances in adjudicated adolescents within a school setting.

Analysis of Research Question 4: A visual analysis of graphed data was conducted to assess the change in positive outcome expectancies related to using substances from baseline, to intervention, to maintenance phase. The dependent variable (outcome expectancy) was collected via the Cognitive Appraisal of Risky Events Scale- Revised (CARE-R). The independent variable was the MI intervention.

Chapter IV: Results

Single Subject Visual Analysis of Data

Weekly measurement was taken of the participants' motivation, self-efficacy, and outcome expectancy. All of the participants completed the required measurement packets and intervention sessions during the time frame of the study. Once per week the individual participants received and completed the Rollnick Readiness Ruler, the DURSE, and two scales of the CARE-R. This data collection continued through the two session MI intervention phase. Following the completion of the intervention each participant completed a four week maintenance phase. None of the participants took medication and none began another treatment during the study. Participant 1 was removed from the school during the last week of his data collection, his last survey was completed in a detention facility. To address the research questions, data were graphed to visually analyze the impact of the intervention on the dependent variables. Visual analysis demonstrates variability in the data pertaining to performance, level, and trend within and across phases. Within this analysis several criteria are examined; changes in the mean level of performance across phases, changes in the level of performance from the end of one phase and the beginning of the next, changes in the trend or slope across phases, and also the latency of change across phases.

Research Question 1

Research Question 1: Does a MI intervention significantly increase motivation to reduce or abstain from substances in adjudicated adolescents within a school setting?

Hypothesis 1: A MI intervention will significantly increase the motivation to reduce or abstain from substances in adjudicated adolescents within a school setting.

To collect data on the level of motivation to avoid using substances, the Rollnick Readiness Ruler was used. Participants rated on a scale from 1-10 how ready he or she was to avoid using substances, the lower numbers of the scale were labeled “Not Ready,” the middle of the scale was labeled “Unsure” and the top of the scale was labeled “Ready.” A higher score would indicate more motivation towards abstention.

Means. Participant 1’s mean score for baseline was 1.33. This mean increased to 4.5 during the intervention, and continued to rise to a mean of 6 during the maintenance phase of the intervention. Participant 1’s percentage of change from the baseline phase to the maintenance phase was 46.67%. This was computed by converting the ten point motivation scale to percentage of differences across phases in order to give an overall statistic of the change across phases.

Participant 2 had a mean baseline score of 1.75 which decreased to 1 during the intervention phase. His score remained low but increased slightly to a mean of 3 within the maintenance phase. His overall percentage of change from the baseline phase to the maintenance phase was 12.5%. Thus indicating that his mean score rose 12.5%

Participant 3 began with a slightly higher mean motivation score than her fellow participants. During baseline her mean score was 4.4 which increased to 5.5 during the intervention phase. Following the intervention it increased slightly to 6. Her total percentage change from baseline to maintenance was 16%

Participant 4 had the smallest increase in motivation across phases. His baseline score was 3.0 which increased to 3.5 during the intervention phase and then advanced to a mean of 4 during the maintenance phase. This was a 10% change from baseline to maintenance. Generally, all of the participants displayed increases in the motivation

means across all phases of the intervention, with the exception of participant 2, whose scores decreased during the intervention phase. The percentage of change scores were calculated to show the differences between baseline means and maintenance means within the context of the 1-10 scale. Participant 1 showed the most change while participant 4 showed the least. Please see Table 1 for a summary of the data.

Table 1

Motivation Mean Scores and Percent Change Across Phases for all Participants

	Baseline	Intervention	Maintenance	% Change
Participant 1	1.33	4.50	6.00	46.67%
Participant 2	1.75	1.00	3.00	12.50%
Participant 3	4.40	5.50	6.00	16.00%
Participant 4	3.00	3.50	4.00	10.00%

Levels and trends within and across phases. Participant 1’s level of motivation throughout baseline remained low and relatively stable. During intervention it increased sharply from the first intervention session to the second. It remained above baseline scores throughout the maintenance phase.

Participant 2 also displayed lower motivation scores that remained stable throughout the baseline phase. His scores decreased to 1 during the intervention phase. Within the maintenance phase his scores decreased and then increased, overlapping his higher scores from the baseline phase. Though overall his level of motivation rose during the maintenance phase and increased when compared to the baseline phase.

Participant 3’s baseline scores were stable and within the “unsure” range of the avoidance motivation scale. Within the intervention phase her score increased from the first session to the second. Her motivation score following the second intervention

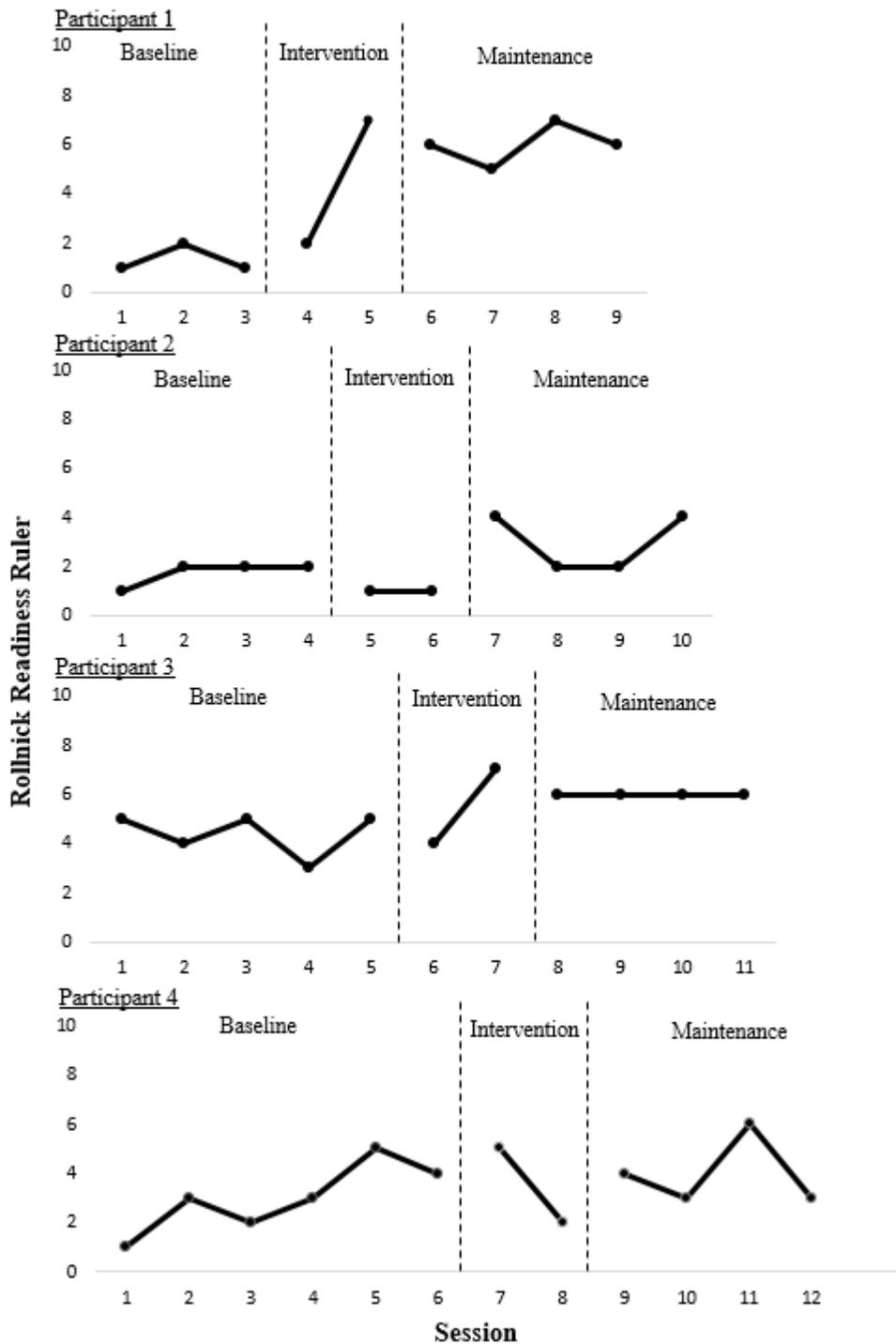
session was her highest individual score. Motivation scores during the maintenance phase also remained stable and higher than all baseline scores.

Participant 4's level of motivation displayed a steady increase during the baseline phase. Beginning in the "not ready" range and increasing to the "unsure" range. During the intervention phase his score decreased from the first session to the second session, thus little difference between the levels of the baseline and intervention phases can be seen. During the maintenance phase his scores were also in the unsure range and the level of the scores is similar to the baseline and intervention phases. However, his highest motivation score did occur during the maintenance phase.

Participants' 1, 3, and 4 showed the most change in motivation within the intervention phase from session one to session two of the intervention. While Participants 1 and 3 showed an immediate increase in motivation, Participant 4's motivation decreased significantly from the first session to the next then continued an upward trend in the maintenance phase.

Participant 2 is the exception, who showed his first largest upward shift immediately following the intervention phase. The implications of these changes are discussed in chapter 5. The graphed data for the Rollnick Readiness Ruler is displayed in figure 6.

Figure 6. Motivation Scores Across Phases for all Participants



Research Question 2

Research Question 2: Does a MI intervention significantly increase self-efficacy to refuse substances in adjudicated adolescents within a school setting?

Hypothesis 2: A MI intervention will significantly increase self-efficacy to refuse substances in adjudicated adolescents within a school setting.

Self-efficacy was measured using an adapted version of the Drug Use Resistance Self –Efficacy Scale (DURSE). The scale asks participants to rate how “sure” he or she is in being able to refuse substances in specific situations, such as at a party or from a relative. Eight questions are rated from 1, “not sure at all” to 4, “definitely sure.” Total scores can range between 8 and 32. Higher scores indicate more substance refusal self-efficacy.

Means. Participant 1 had a baseline mean of 22 which decreased to 21.5 during the intervention. Within the maintenance phase his scores indicated a slightly higher mean of 25. His percentage of change of the difference between baseline and maintenance was 12.5% indicating some improvement in his refusal self-efficacy.

Participant 2 had a similar baseline mean to participant 1 of 21. This also decreased during the intervention to a mean of 20. Ultimately, the mean score increased during maintenance to 23.5. The scaled difference of his baseline and maintenance scores was 10.41%.

Participant 3 had the lowest baseline self-efficacy score and the most improvement in the means of her scores. Her baseline scores had a mean of 18.6 which increased during intervention to 23. The mean during maintenance increased slightly to

25.5. Her overall improvement in means from baseline to maintenance was a 28.75% increase.

Participant 4 began with the highest baseline mean of 27. This mean increased during the intervention phase to 29 and then his scores during maintenance had a mean of the highest score achievable. His overall improvement was comparatively moderate with a percentage change of 20.83% from baseline mean to maintenance mean. Table 2 has a summary of the means for the participants.

Table 2

Self-Efficacy Mean Scores and Percent Change Across Phases for all Participants

	Baseline	Intervention	Maintenance	% Change
Participant 1	22	21.5	25	12.50%
Participant 2	21	20	23.5	10.41%
Participant 3	18.6	23	25.5	28.75%
Participant 4	27	29	32	20.83%

Levels and trends within and across phases. Participant 1’s level of self-efficacy was stable throughout the baseline phase. During the intervention phase he had a lower score for the first intervention session then a higher score during the second session indicating an upward trend. His scores during the maintenance phase began high then significantly dropped. A consistent trend could not be identified during the maintenance phase or overall. Following the intervention, Participant 1’s score increased more than previous weeks, however, this scoring decreased sharply during maintenance

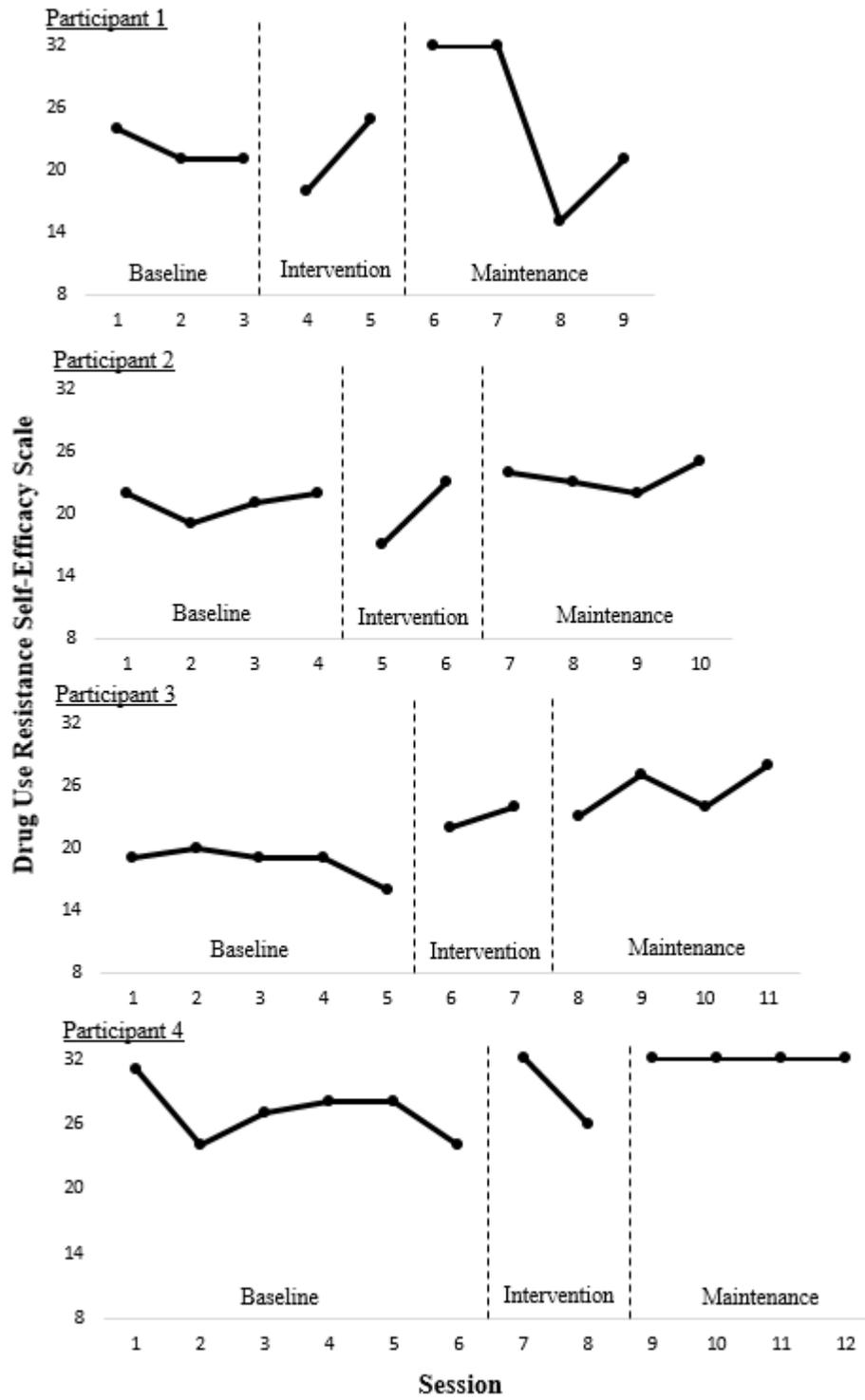
Participant 2’s scores during the baseline phase remained consistent in the middle range of refusal self-efficacy. During the intervention his scores were similar to participant 1’s with his first score being low and a higher second score. Participant 2 largest change during the study was within the intervention phase, where his score

decreased from baseline then increased in the second intervention session. His scoring remained at this slightly elevated level during the maintenance phase, visually depicting a small upward trend.

Participant 3 had scores in mostly the middle to lower range of the self-efficacy measure throughout baseline. A downward trend was noted upon visual inspection within the baseline phase. Her largest shift in scoring occurred when the intervention began. Her scores continued this ascending trend throughout maintenance.

Participant 4 scored himself highly on the self-efficacy measure. His first score during the baseline phase indicated that he felt able to refuse substances in most any situation. His scores decreased within the baseline phase but remained stable. His first score during the intervention also topped out the scale then his second score dropped to his baseline level. The most increased shift in scoring happened when the intervention began, similar to participant 3. During the maintenance phase it consistently remained high. Please see Figure 7 for the graphed data of the self-efficacy measure.

Figure 7. Self-Efficacy Scores Across Phases for all Participants



Research Question 3

Research Question 3: Does a MI intervention significantly increase positive outcome expectancies related to reducing or abstaining from substances in adjudicated adolescents within a school setting?

Hypothesis 3: A MI intervention will significantly increase positive outcome expectancies related to reducing or abstaining from substances in adjudicated adolescents within a school setting.

Data for research question 3 were collected using an adapted scale from the CARE-R. This measure asked participants to rate how likely it is that something good would happen if he or she avoided using substances. It gave examples such as; “do better in school” and “have a better relationship with my family.” It has 12 items pertaining to separate substances (e. g. marijuana and cocaine) and also drinking behaviors (e.g. drinking more than 5 drinks in one day and driving after drinking). Participants were to rate on a 1 to 7 scale how likely something good would happen if he or she did not do these things, a rating of 1 being “not likely” and a rating of 7 being “extremely likely.” Higher overall scores indicate more positive outcome expectancies for avoiding or abstaining from substances. Scores for this measure can range from 12 to 84.

Means. Participant 1 had a baseline mean of 41 which increased during intervention to a mean of 58.5 for the two scores. His mean score for the maintenance phase increased further to 70.25. His percentage of change from baseline mean to maintenance mean was 40.62% indicating a large amount of change.

Participant 2 had a high baseline mean of 70.25 which increased to a mean of 75 in the intervention phase. His mean score in the maintenance phase increased slightly from the intervention phase to 75.25. His scaled percentage of change was 6.95%.

Participant 3 also had higher baseline scores. She had a baseline mean of 69 which increased to a mean of 77 within the intervention phase. The mean for her scores during the maintenance phase was one point higher. Her overall difference in the means between baseline and maintenance was an increase of 12.5%.

Participant 4 began with the highest baseline mean of 81.5 which decreased during the intervention to a mean of 74.5. His scored averaged 81.5 for the maintenance phase as well. Therefore, the difference between baseline and maintenance is 0.0% indicating no increase in his scoring.

Table 3

Positive Avoidance Mean Scores and Percent Change Across Phases for all Participants

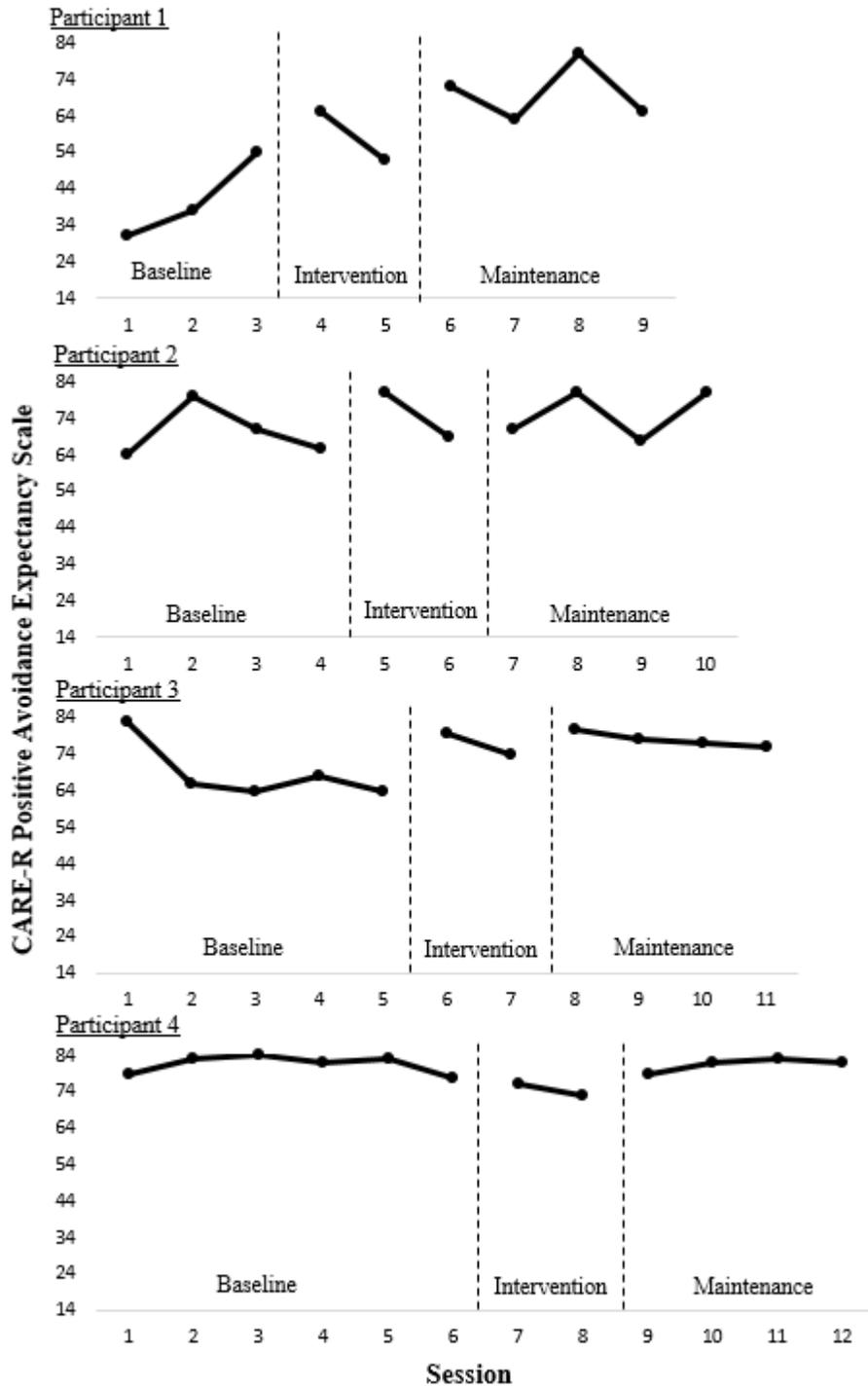
	Baseline	Intervention	Maintenance	% Change
Participant 1	41	58.5	70.25	40.62%
Participant 2	70.25	75	75.25	6.95%
Participant 3	69	77	78	12.50%
Participant 4	81.5	74.5	81.5	0.00%

Levels and trends within and across phases. Most of the participants scored highly on this measure throughout the study, indicating that they already believe avoiding substance use will lead to positive outcomes. Participant 1 did not begin with this belief. His baseline scores had an increasing trend but a lower level of scoring compared to his intervention and maintenance phases. During maintenance his scores were consistently higher than his baseline scores and had a stable increasing trend.

Participant 2 scored similarly throughout the phases with a small level increase in each phase of the study. This is also true for participant 3 who began scoring highly during baseline then dropped. Her scores increased slightly for the intervention and maintenance phases. The largest shift in her scoring occurred during the first intervention session. Participant 4 scored the most consistently across the phases thus no noticeable increases are evident from visual inspection of the data.

An interesting observation in the data showed that all four of the participants had a higher score for the first session of the intervention and a lower score for the second session. These scores ultimately increased again in maintenance. Please see Figure 8 for the graphed data from this outcome expectancy measure.

Figure 8. Positive Avoidance Expectancy Scores Across Phases for All Participants



Research Question 4

Research Question 4: Does a MI intervention significantly decrease positive outcome expectancies related to using substances in adjudicated adolescents within a school setting?

Hypothesis 4: A MI intervention will significantly decrease positive outcome expectancies related to using substances in adjudicated adolescents within a school setting.

Positive outcome expectancies related to use were measured using an adapted version of the CARE-R. This scale had all of the same items from the previous scale, however the directions asked the participants to rate how likely it was that something good would happen if he or she used substances. The directions gave examples of good things that could happen (e.g. experience pleasure and spend time with friends). Lower scores indicate less positive outcome expectancy related to using substances.

Means. Participant 1 had a mean baseline score of 34.67 which decreased slightly to a mean of 32.5 within the intervention phase. His mean score during the maintenance phase decreased further to 23.75. The overall percentage decrease of the mean across phases was 15.17%.

Much like the previous scale, participants 2, 3, and 4 began with scores indicating that he or she already believed that using substances would not lead to more positive outcomes. Participant 2 had a baseline mean of 25.75, which decreased to 19 then increased again during the maintenance phase to 21.25. His scaled percentage change was a 6.26% decrease in means from baseline to maintenance.

Table 4

Positive Use Mean Scores and Percent Change Across Phases for all Participants

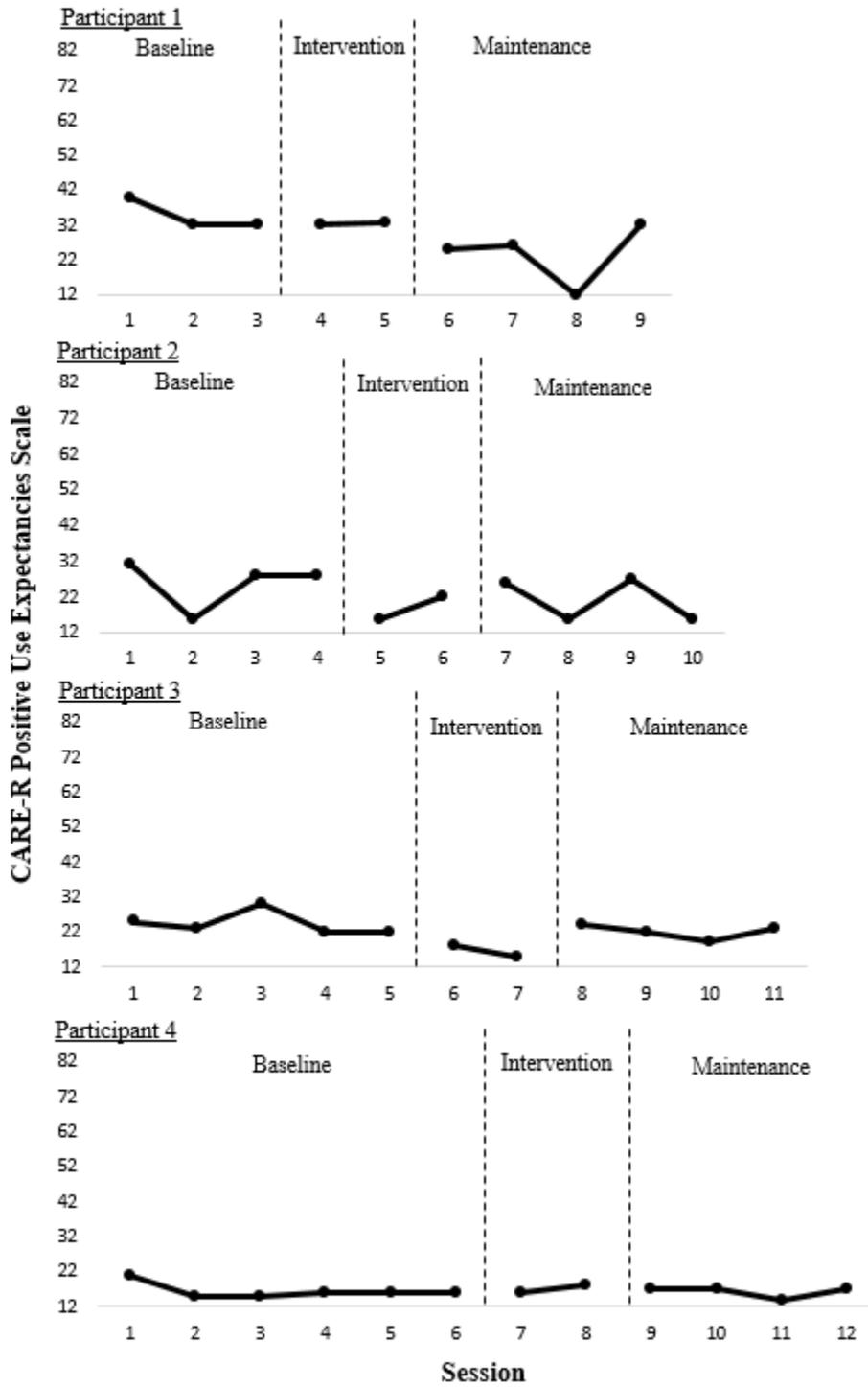
	Baseline	Intervention	Maintenance	% Change
Participant 1	34.67	32.5	23.75	-15.17%
Participant 2	25.75	19	21.25	-6.26%
Participant 3	24.4	16.5	22	-3.05%
Participant 4	16.5	17	16.25	-0.35%

Levels and trends within and across phases. Participant 1 had a stable baseline in the middle to lower range of the scale. This trend continued through the intervention then it decreased during the maintenance phase. Though the level in the maintenance phase is lower than in the baseline or maintenance phases, trend was inconsistent. He displayed an immediate shift in scoring following the intervention phase, but his progress was inconsistent. The final score in the maintenance phase overlapped with the scores from the baseline.

Participant 2's level of scoring during the baseline phase was in the lower range of the scale. Within the intervention phase this level decreased. However, the level increased slightly within the maintenance phase. His scoring decreased within the intervention phase, however because he had similar scores in throughout the study this cannot be interpreted as reliable change A decreasing trend across phases is noticeable.

Participants 3 and 4 consistently scored in the lower range of the scale throughout the study. There was no evident change in their overall outcome expectancy of using substances.

Figure 9. Positive Use Expectancy Scores Across Phases for all Participants



Chapter V: Discussion

Summary of Results

The first research question considered the impact of a MI intervention on the motivation to discontinue substance use. It was hypothesized that the intervention would increase motivation to stop using substances. The results of the study are consistent with this hypothesis. Across participants there was an overall increase in the motivation to stop using substances.

The increase directly corresponded with the implementation of the intervention for three of the four participants. The first participant had the largest increase in motivation during the intervention and maintained this increase once the intervention was completed. The second and third participants also increased their motivation to discontinue substance use, either within or directly following the intervention. The fourth participant appeared to increase his motivation throughout the study with no noticeable change relating to the intervention. Overall, these data indicate change in motivation due to the implementation of the intervention supporting the hypothesis.

The second research question examined the impact of a MI intervention on the self-efficacy of the adolescents to refuse substances. It was hypothesized that the intervention would increase their belief that they would be able to refuse substances, if offered them in different social situations. The results provided evidence that MI was an efficacious way to positively influence self-efficacy. Through comparison of the mean scores throughout the phases and visual inspection of the levels, all of the participants increased in their self-efficacy following the intervention.

Participant 1 evidenced a large increase following the intervention, then dropped during the third week of maintenance. This change directly corresponded to his moving from his father's to his sister's house, spending time with drug related peers (in lieu of the required afterschool program), and being removed from the school and placed in detention due to this behavior. Therefore, he reported that his motivation to stop using substances continued to increase, but his ability to refuse them decreased due to his living situation. The remaining participants demonstrated gains in self-efficacy and higher scores following the intervention thus supporting the hypothesized connection between MI and its impact on self-efficacy.

In terms of the final research questions it was hypothesized that the MI intervention would increase the participants' positive outcome expectancy related to avoiding substances and decrease their positive expectancies related to using substances. These changes were monitored using modified scales from the CARE-R. All of the participants exhibited an increase in positive expectancies related to avoiding substances use, supporting the hypothesis. Interestingly, during the intervention each participant demonstrated a decrease in positive expectancies related to avoiding substances from the first to the second session. Then, an increase following the completion of the intervention. This data indicates that the MI intervention had a certain influence on expectancies from one session to the next.

Analysis of the data related to the fourth research question revealed that the participants exhibited a general decrease in positive outcome expectancies related to using substances, lending support for the hypothesized impact of the intervention. Participant one, who began with the most positive expectancies of using substances,

decreased directly following the intervention, then decreased again at the third maintenance point, when connecting with his drug related peers. Participants two and three demonstrated varying opinions on the positive outcomes of using substances, but exhibited their lowest scores during the intervention. Similar results were noted for the fourth participant in both the expectancies related to avoiding and using substances. He demonstrated scores that indicated he already believed that using substances would not lead to good outcomes, and avoiding substances would lead to better outcomes. However, he still exhibited a slight improvement in level and trend following the intervention.

Conclusions

The results from this study indicate initial support for the use of MI within a population of substance using adjudicated adolescents in a school setting. This unique setting allowed for close examination of MI within the distinct population of adjudicated adolescents. Myers and colleagues (2001) indicated that the rate of substance abuse is higher among these individuals than average adolescents. However, there are few MI studies that include them (Barnett et. al., 2012). This research begins to close that gap in the MI literature. MI was first designed for use in adults with alcohol addiction (Miller and Rollnick, 2009) and has been adapted for expanded use with adolescents, it was appropriate to use in this population of youth that is at-risk to develop more substance related difficulties in the future (Chassin, 2004).

As stated previously, Bandura's social cognitive theory explains that when a person has the motivation to accomplish an action, the self-efficacy to accomplish an action, and a positive outcome expectancy associated with that action, the action is likely to occur (Bandura, 1986). These are the theoretical foundations of the mechanisms which

make MI an effective intervention for adults. Research on MI is currently being established for adolescents, however, certain gaps exist in the literature (Barnett, et. al., 2012). To further this research, the current study examined the effects of a brief MI intervention on these mechanisms within a previously overlooked population of adjudicated adolescents.

It is important for clinicians to understand how MI impacts each of these mechanisms in order to tailor interventions for their clients. By understanding an adolescent's motivation, self-efficacy, and outcome expectancy, progress can be made toward abstaining from substance use. Few studies detail the impact that MI has on these mechanisms and of those studies most focus on alcohol or smoking, which are more prevalent in the general population of adolescents (Jensen, et. al., 2011). The current findings lend support for the effectiveness of MI in this less studied population of at-risk youth. The following paragraphs connect previous research to the current findings.

Relevant Literature

Patten and colleagues (2008) reported similar findings to the current research in a study that followed adolescents' motivation and self-efficacy related to smoking cessation while receiving a MI intervention. Throughout their three week study they noted that motivation and self-efficacy increased among their participants, though they did not collect any baseline data and did not utilize any control group. The findings from the current study confirm and build upon this research. The participants in this study also increased in their motivation and self-efficacy, but for most participants this only occurred after the intervention was administered and continued to increase following the

completion of the intervention, thus confirming that it was the intervention that impacted the mechanisms.

Erol and Erdogan (2008) noted that all of the mechanisms increased together at three and six month follow ups after the intervention. The current study also noted that the mechanisms continue to increase following the completion of the intervention. However, they measured only the decrease in positive expectancies related to using tobacco. The current study expands on this research with evidence that MI increases positive expectancies related to abstaining from substances as well. This distinction is important because there is evidence that having positive outcome expectancies related to abstaining is more influential of behavior than decreasing the positive expectancies related to use (Nikolettli & Taussig, 2006; Oei, Hasking, & Philips, 2007). The current study also gives a more detailed view of how MI impacts the mechanisms of change during the intervention.

Relevant Theory

The methodological design of this study allows for specific clarifications to be drawn about how MI impacts this population of adolescents, such as how MI impacts motivations during the intervention. The current research lends evidence to the purported minimum amount of time needed to make an impact on the motivation of the adolescent. Miller and Rollnick suggest an MI intervention be administered in two sessions (Miller & Rollnick, 2009). Goti and colleagues (2009) compared single session MI to a control group in adolescents referred for psychiatric care. They noted that there was no difference between the groups when they surveyed the subjects' future intent to use substances. Specifically, they measured the motivation to use substances in the future. The current

study found similar results in motivation following the first MI session. The participants did not change their motivation after the first session. Visibly significant changes were apparent only after the second session of MI. It can be speculated that two sessions are required for a change to occur.

As previously stated in chapter two, one of the key points in MI is that motivation is not a client trait, but a fluctuating product of interpersonal interaction. (Miller & Rollnick, 2004). There is evidence for this hypothesis in the results of this study. Participants one, three, and four had their largest fluctuations during the intervention phase of the study. The second participant had his largest increase directly following the intervention. One explanation is that the interpersonal interaction that occurred during the intervention had a specific subsequent impact on the motivation of the participants, thus supporting the extant theory on MI. Of course, it is possible that something else accounted for the changes after the intervention, however, it is reasonable to speculate that as an adolescent explores their own motivations their resolve towards change fluctuates more so than it would without intervention. These findings are consistent with several studies reviewed by Barnett and colleagues (2012) showing that motivation both increases and decreases during the intervention.

Another important component of MI that this study supports is its two phases (Miller & Rollnick, 2002). The first phase is structured by the adolescent's existing motivation and self-efficacy beliefs. In this phase, self-efficacy and positive outcome expectancies are enhanced to bring out motivation towards refusing substances. Support for this approach was evident in participants one, two, and three. Participant four had different needs than his peers. His results indicated that he already possessed the self-

efficacy to resist substance use and positive outcome expectancies, however, he did not believe that changing was important for his goals. Thus, the positive impact of the intervention was the least noticeable in his scores.

The second phase of MI is to develop discrepancy between the goals of the client and his or her behavior, enhancing commitment to refusing substances. Results were consistent with this assumption for the first three participants. Their motivations scores intensely increased either immediately following the second session (participants one and three) or in the first maintenance session (participant 2). This was also true for the self-efficacy scores, all of the participants scores visibly increased from the first session to the second.

However, as participant four explored his goals (e.g., staying alive on the street) he reported that he became less motivated to refuse substances. During the second session he shared that he would like to go to college and graduate school for a degree in business, however, he indicated that this goal was completely out of his reach and had already resolved not to try. Talking about the discrepancy between his behavior and his goals only served to discourage him. This result is evident in his motivation and self-efficacy scores. He did not need the self-efficacy to refuse substances, he needed the self-efficacy to achieve success in school. Though most participants benefited from two sessions, it may be that more sessions are required for adolescents with this pattern of responding.

As previously indicated, through the use of MI as a brief intervention for substance use, adolescents who are at-risk to develop more substance difficulties can improve the cognitive mechanisms that lead to the avoidance of substance use. Although the intervention is very flexible, when not manualized, it can be improved upon by the

close and careful observations of a trained therapist. MI provides a framework through which professionals working with adolescents can find the active ingredients to make particular gains and improve their positive impact.

Limitations

Although initial findings support the use of MI as a brief intervention for this population of at-risk adolescents, limitations are present within this research. A single subject multiple baseline design was implemented to more closely examine the efficacy of the MI intervention for each individual. This applied methodology and design was the most appropriate for use within a very specific population of adolescents in a charter school for adjudicated youth, it was also most appropriate to address the research questions and maximized the interpretation of the clinical significance of the findings. Due to time and staffing limitations, it was not possible to include additional components that would have strengthened the design, such as longer baseline and longer maintenance phases.

As noted in chapter three, even though the time frame of the study was relatively short (12 weeks), maturation remains a threat to internal validity. Maturation refers to the natural development of the participant overtime (Richards et. al., 1999). This threat was managed with the use of the multiple baseline design, because changes were observable only when the intervention occurred for that individual participant, and not just over the course of the study. However, maturation still could have an impact on the results overall. Attrition was also a threat to the validity of the study, two participants dropped out within the first week of the study. Despite this threat, enough participants completed the study to

allow for conclusions to be made, however, not with the strength that six participants could have given.

The intervention was implemented according to the methodological design of the study, integrity checks were used, and the researcher was adequately trained in the use of MI with adolescents, however, direct supervision from an expert trained in MI was unavailable. The feedback from another professional trained in MI could have potentially guided the intervention more effectively. Regression to the mean also remained a potential threat to the study. The participants were selected because they showed favorable attitudes toward drug use, their scores may have improved (i.e., became less favorable) over time because the mean attitude of adolescents generally is less favorable than expressed by the sample. Moving from extreme scores to more typical scores is a phenomenon often found when subjects are tested repeatedly. Also, the participants were given the exact same surveys every week, due to this repeated assessment they may have remembered their answers from the previous week and used those, rather than giving honest opinions. Because of these limitations, results may not have been as visibly dramatic as they could have been.

Even though there was a visible change in the participants when the intervention was implemented, personal history (e.g., individual experiences that were unaccounted for in the study measures) also could have impacted how the participants responded to the intervention. For example, during the maintenance phase, the first participant moved to his sister's house and became involved with more drug related peers and was subsequently placed in detention. Additionally, the participants were aware that they

were in the study, so they could have changed their responding based on what they thought the experimenter wanted to hear.

As noted in chapter three, this study cannot be generalized to the population at large because it was meant to explore a small category of individuals. The results from the study can be applied to adjudicated youth who have used substances, a population that has been shown to benefit from the correct use of this intervention. The advantage of the way the study was implemented was in the ecological validity. The naturalistic setting ensures that the results are unique to these kinds of individuals. The results were not produced in an artificially controlled environment such as a laboratory, but in a real world setting. Thus the results are more likely to be generalizable across this subpopulation and can likely be applied in similar settings with consistent results.

Recommendations for Future Research

In this study, the efficacy of a MI intervention was examined. Its direct impact on the mechanisms of change within a specific population of adolescents provided support for its use and conveyed clinically relevant insight about its practice. Previously existing gaps in the literature base were also addressed. However, future research could also contribute to the empirical base of this intervention.

Although two sessions is the recommended amount of MI for its general use, and evidence that supports this implementation was found in the current results, future research could seek to establish the exact differences between two sessions and more. This would give interventionists the information necessary to choose how to extend their brief MI technique. It would also provide research on the type of client who warrants and would benefit from longer MI.

Additionally, future research could include confirmed drug use information. This study focused on the cognitive mechanisms, but it could be helpful to know the participants behaviors by confirming their drug use through urine analysis. This information is readily available within this population of individuals and there is little research on how current or unreported substance use impacts the efficacy of the intervention. It is possible that MI is so flexible and direct that adolescents who are currently using substances still benefit from it, while this may not be true of a cognitive behavioral approach due to its more complex foundations and need for the client to be especially self-aware (Deas, 2008). In other words, the MI approach supports individual change mechanisms to be effective rather than requiring the introspection needed for cognitive behavioral therapy. Personal introspection could be difficult for adolescents under the influence of substances.

Another area warranting further exploration is the population of adolescents who present with co-morbid conditions and also those who are receiving special education services. Though there are many adolescents who are using substances and are diagnosed with psychological disorders and learning disabilities, there are few studies that examine the efficacy of MI within these individuals. The social cognitive theory mechanisms maybe affected differently and the way MI is delivered may need special consideration. For example, an adolescent who is using substances to self-medicate a depressive disorder could have very different outcome expectancies related to use. These would likely need to be addressed prior to motivation and self-efficacy. Those adolescents with learning disabilities may need different kinds of self-efficacy support.

Research into Practice

The current study examined the impact of MI on the motivation, self-efficacy, and outcome expectancies of a population of at-risk youth. As detailed in chapter two, these social cognitive theory mechanisms guide decision making. Based on its theory, it was hypothesized that MI would be efficacious in influencing these mechanisms within this a population of adolescents who require an intervention for their substance use. By utilizing a single-subject multiple baseline design, the findings were able to be closely inspected for their clinical significance. The results indicated that MI directly and positively affects the social cognitive theory mechanisms that lead to avoidance of substance use.

The evidence presented in this study for MI as a brief substance use intervention for adjudicated adolescents provides support for its use in a school with this specific population. It is important to provide school personnel with effective ways to reduce substance use. The MI intervention is well suited to this application because it is efficient, makes a measurable impact, and is relatively simple to administer, provided that the school train its employees in MI. This intervention can potentially enhance the relationships between the students and the school personnel by making their goals clear, thus assisting in meeting the needs of the student and ultimately facilitating their success within the school.

References

- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th Ed.). Arlington, VA: American Psychological Association.
- Amrhein, P. C., Miller, W. M., Yahne, C. E., Palmer, M., & Fulcher, L. (2003). Client commitment language during motivational interviewing predicts drug use outcome. *Journal of Consulting and Clinical Psychology, 71*, 862-878.
- Arkowitz, H., & Westra, H. A. (2009). Introduction to the special series on motivational interviewing and psychotherapy. *Journal of Clinical Psychology, 65*, 1149-1155.
- Arthur, M. W., Hawkins, D. Pollard, J. A., Catalano, R. F., & Baglioni, A. J. (2002). Measuring risk and protective factors for use, delinquency, and other adolescent problem behaviors: Communities that care youth survey. *Evaluation Review, 26*, 575-600.
- Atkinson, C., & Amesu, M. (2007). Using solution-focused approaches in motivational interviewing with young people. *Pastoral Care in Education, 2*, 31-37.
- Baer, D. M., Wolf, M. M., & Risley, T. R., (1968). Some current dimensions of applied behavior analysis. *Journal of Applied Behavior Analysis, 1*, 91-97.
- Baer, J. S., Beadnell, B., Garrett, S. B., Hartzler, B., Wells, E. A., & Peterson, P. L. (2008). Adolescent change language within a brief motivational intervention and substance use outcomes. *Psychology of Addictive Behaviors, 22*, 570-575.
- Baer, J. S., Garrett, S. B., Beadnell, B., Wells, E. A., & Peterson, P. L. (2007). Brief motivational intervention with homeless adolescents: Evaluating effects on substance use and service utilization. *Psychology of Addictive Behaviors, 21*, 582-586.

- Bandura, A. (1977). *Social Learning Theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, *37*, 122-147.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: W.H. Freeman and Company.
- Barnett, E., Sussman, S., Smith, C., Rohrbach, L. R., & Spruijt-Metz, D. (2012). Motivational interviewing for adolescent substance use: A review of the literature. *Addictive Behaviors*, *37*, 1325-1334.
- Brown, R. A., Ramsey, S. E., Strong, D. R., Myers, M. G., Kahler, C. W., Lejuez, C. W., Niaura, R., ... Abrams, D. B. (2003). Effects of motivational interviewing on smoking cessation in adolescents with psychiatric disorders. *Tobacco Control*, *12*, 3-10.
- Brown, J. M., & Miller, W. M. (1993). Impact of motivational interviewing on participation and outcome in residential alcoholism treatment. *Psychology of Addictive Behaviors*, *9*, 211-218.
- Brown, R. A., Strong, D. R., Abrantes, A. M., Myers, M. G., Ramsey, S. E., & Kahler, C. W. (2009). Effects on substance use outcomes in adolescents receiving motivational interviewing for smoking cessation during psychiatric hospitalization. *Addictive Behaviors*, *34*, 887-891.
- Carpenter, C. M., & Howard, D. (2009). Development of a Drug Use Resistance Self-Efficacy (DURSE) scale. *American Journal of Health Behavior*, *33*, 147-157.

- Caviness, C. M., Hagerty, C. E., Anderson, B. J., de Dios, M. A., Hayaki, J., Herman, D., Stein, M. D. (2013). Self-efficacy and motivation to quit marijuana use among young women. *The American Journal on Addictions, 22*, 373-380.
- Chassin, L. (2004). Adolescent substance abuse. In R. M. Lerner & L. Steinberg (Eds.), *Handbook of Adolescent Psychology*. Hoboken, NJ; John Wiley & Sons.
- Chassin, L., Ritter, J., Trim, R. S., & King, K. A. (2003). Adolescent substance use disorders. In: Mash, E.J., & Barkley, R. A. (Eds.), *Child Psychopathology* (2nd Ed.) (pp. 199-230). New York, NY: Guilford Press.
- Centers for Disease Control and Prevention. (2010). Mortality Statistics. Retrieved from <http://www.cdc.gov/nchs/fastats/deaths.htm>
- Clark, D. B., & Winters, K. C. (2002). Measuring risks and outcomes in substance use disorders prevention research. *Journal of Counseling and Clinical Psychology, 70*, 1207-1223.
- Colby, S. M., Nargiso, J., O'Leary-Tevyaw, T., Barnett, N. P., Metrik, J., Lewander, W., ... Monti, P. M. (2012). Enhanced motivational interviewing versus brief advice for adolescent smoking cessation: Results from a randomized clinical trial. *Addictive Behaviors, 37*, 817-823.
- Conner, B. T., Helleman, G. S., Ritchie, T. L., & Noble, E. P. (2010). Genetic, personality, and environmental predictors of drug use in adolescents. *Journal of Substance Abuse Treatment, 30*, 178-190.
- Cupertino, A., Berg, C., Gajewski, B., Hui, S. A., Richter, K., Catley, D., & Ellerbeck, E. F. (2011). Change in self-efficacy, autonomous and controlled motivation predicting smoking. *Journal of Health Psychology, 17*, 640-652.

- DeLeon, G. & Jainchill, N. (1986). Circumstance, motivation, readiness and suitability as correlates of treatment tenure. *Journal of Psychoactive Drugs*, 18, 203-208.
- Deas, D. & Thomas, S. (2002). Comorbid psychiatric factors contributing to adolescent alcohol and other drug use. *Alcohol Research and Health*, 26, 116-121.
- Deas, D. (2008). Evidence-based treatments for alcohol use disorders in adolescents. *Pediatrics*, 121, 348-354.
- Deas, D., Gray, K., Uphadyaya, H. (2008). Evidence-based treatments for adolescent substance use disorders. In R. G. Steele (Ed.), *Handbook of evidence-based therapies for children and adolescents: Bridging science and practice* (pp. 429-441). New York, NY: Springer.
- Dennis, M., Godley, S. H., Diamond, G., Tims, F. M., Babor, T., Donaldson, J., ... Funk, R. (2004). The cannabis youth treatment (CYT) study: Main findings from two randomized trials. *Journal of Substance Abuse Treatment*, 27, 197-213.
- DiClemente, C. C., Schlundt, D. & Gemmell, L. (2003). Readiness and stages of change in addiction treatment. *American Journal on Addictions*, 13, 103-119.
- Dijkstra, A. Conijn, B. & De Vries, H. (2006). A match-mismatch test of a stage model of behavior change in tobacco smoking. *Addiction*, 101, 1035-1043.
- Dunn, C., Deroo, L., & Rivara, F. P. (2001). The use of brief interventions adapted from motivational interviewing across behavioral domains: A systematic review. *Addiction*, 96, 1725-1742.
- Duvall, J. L., Oser, C. B., & Lukefield, C. G. (2008). Readiness to change as a predictor of drug-related behaviors in a sample of rural felony probationers. *The American Journal of Drug and Alcohol Abuse*, 34, 741-748.

- Ehret, P. J., Ghaidarov, T. M., & LaBrie, J. W. (2013). Can you say no? Examining the relationship between drinking refusal self-efficacy and protective behavioral strategy use on alcohol outcomes. *Addictive Behaviors, 38*, 1898-1904
- Erol, S., & Erdogan, S. (2008). Application of a stage based motivational interviewing approach to adolescent smoking cessation: The transtheoretical model-based study. *Patient Education and Counseling, 72*, 42-48.
- Fromme, K., Katz, E. C., & Rivet, K. (1997). Outcome expectancies and risk-taking behavior. *Cognitive Therapy and Research, 21*, 421-442.
- Glantz, M. D. (2010). Touchstone issues of substance abuse-dependence etiology In: Scheier, L. (Ed.), *Handbook of drug use etiology: Theory, methods, and empirical findings* (pp. 51-69). Washington, DC: American Psychological Association.
- Goti, J., Diaz, R., Serrano, L., Gonzalez, L., Calvo, R., Gual, A., & Castro, J. (2010). Brief intervention in substance-use among adolescent psychiatric patients: A randomized controlled trial. *European Child & Adolescent Psychiatry, 19*, 503-511.
- Henggeler, S. W., Sheidow, A. J., & Cunningham, P. B. (2008). Promoting the implementation of an evidence-based intervention for adolescent marijuana abuse in community settings: Testing the use of intensive quality assurance. *Journal of Clinical Child & Adolescent Psychology, 37*, 682-689.
- Horner, R. H., Carr, E. G., Halle, J., McGee, G., Odom, S. & Wolery, M. (2005). The use of single-subject research to identify evidence-based practice in special education. *Exceptional Children, 71*, 165-179.

- Horsfall, J., Cleary, M., Hunt, G. E., & Walter, G. (2009). Psychosocial treatments for people with co-occurring severe mental illnesses and substance use disorders (dual diagnosis): A review of empirical evidence. *Harvard Review of Psychiatry, 17*, 24-34.
- Jaffe, M. L. (1998). *Adolescence*. New York, NY: John Wiley & Sons.
- Jensen, C. D., Cushing, C. C., Aylward, B. S., Craig, J. T., Sorell, D. M., & Steele, R. G. (2011). Effectiveness of motivational interviewing interventions for adolescent substance use behavior change: A meta-analytic review. *Journal of Consulting and Clinical Psychology, 79*, 433-440.
- Joe, G. W., Simpson, D., & Broome, K. M., (1998). Effects of readiness for drug abuse treatment on client retention and assessment of process. *Addiction, 93*, 1177-1190.
- Jones, B. T. & McMahon, J. (1994). Negative alcohol expectancy predicts post treatment abstinence survivorship: The whether, when, and why of relapse to a first drink. *Addiction, 89*, 1653-1665
- Katz, E. C., Fromme, K., & D'Amico, E. J. (2000). Effects of outcome expectancies and personality on young adults' illicit drug use, heavy drinking, and risky sexual behavior. *Cognitive Therapy and Research, 24*, 1-22.
- Kazdin, A. E. (1982). *Single-case research designs: Methods for clinical and applied settings*. New York, NY: Oxford University Press.
- Kerig, P. K. & Wenar, C. (2006). *Developmental psychopathology: From infancy through adolescence* (5th Ed.). New York, NY: McGraw-Hill.

- Korcha, R. A., Polcin, D. L., Bond, J. C., Lapp, W. M., & Galloway, G. (2011). Substance use and motivation: A longitudinal perspective. *The American Journal of Drug and Alcohol Abuse, 37*, 48-53
- Larimer, M. E., & Crouce, J. M. (2007). Identification, prevention, and treatment revisited: Individual-focused college drinking prevention strategies 1999-2006. *Addictive Behaviors, 32*, 2439-2468.
- Liddle, H. A., Dakof, G. A., Turner, R. M., Henderson, C. E., & Greenbaum, P. E. (2008). Treating adolescent drug abuse: A randomized trial comparing multidimensional family therapy and cognitive behavior therapy. *Addiction, 103*, 1660-1670.
- Maisto, S. A., Krennek, M., Chung, T., Martin, C. S., Clark, D. & Cornelius, J. (2011). A comparison of the concurrent and predictive validity of three measures of readiness to change alcohol use in a clinical sample of adolescents. *Psychological Assessment, 23*, 983-994.
- Marlatt, G. A. & Baer, J. S. Quigley, L. A. (1995). Self-efficacy and addictive behavior. In: Bandura, A. (Ed.), *Self-efficacy in changing societies* (pp. 289-315). New York, NY: Cambridge University Press.
- Marlatt, G. A., Baer, J. S., Kivlahan, D.R., Dimeff, L.A., Larimer, M.E., Quigley, L.A., ... Williams E (1998). Screening and brief intervention for high-risk college student drinkers: Results from a 2-year follow-up assessment. *Journal of Consulting and Clinical Psychology, 66*, 604-615.

- Martino, S. C., Collins, R. L., Ellickson, P. L., Schell, T. L., & McCaffrey, D. (2006).
Socio-environmental influences on adolescents' alcohol outcome expectancies: A
prospective analysis. *Addiction, 101*, 971-983.
- McMillan, J. H., & Schumacher, S. (2010). *Research in education: Evidence-based
inquiry* (7th ed.). Upper Saddle River, NJ: Pearson Education, Inc.
- McNally, A. M., & Palfai T. P. (2001) Negative emotional expectancies and readiness to
change among college student binge drinkers. *Addictive Behaviors, 26*, 721-734.
- Miller, W. M., & Rollnick, S. J. (2002). *Motivational Interviewing* (2nd ed.). New York,
NY: The Guildford Press.
- Miller, W. M. (2005). Motivational interviewing and the incredible shrinking treatment
effect [Editorial]. *Addiction, 100*, 421-422.
- Miller, W. M. (2009). Conversation with William R. Miller [Journal Interview].
Addiction, 104, 883-893.
- Miller, W. M., & Rollnick, S. (2004). Talking oneself into change: Motivational
interviewing, stages of change and therapeutic process. *Journal of Cognitive
Psychotherapy: An International Quarterly, 18*, 299-308.
- Miller, W. M., & Rollnick, S. (2009). Ten things that motivational interviewing is not.
Behavioural and Cognitive Psychotherapy, 17, 129-140.
- Miller, W. M., & Rose, G. S. (2009). Toward a theory of motivational interviewing.
American Psychologist, 64, 527-537.
- Miller, W. M., Westerberg, V. S., Harris, R. J., & Tonigan, J. S. (1996). What predicts
relapse? Prospective testing of antecedent models. *Addiction, 91*, 155-171.
- Motivational Interviewing. (2010). Retrieved from www.motivationalinterview.org

- Moyers, T. B., Martin, T., Manuel, J. K., Hendrickson, S. M., & Miller, W. M. (2005). Assessing competence in the use of motivational interviewing. *Journal of Substance Abuse Treatment, 28*, 19-26.
- Moyers, T.B., Martin, T., Manuel, J. K., Miller, W.R., & Ernst. D. (2010). Motivational Interviewing Treatment Integrity 3.1.1: Revised Global Scales.
- Myers, M. G., Brown, S. A., Tate, S., Abantes, A., & Tomlinson, K. (2001). Toward brief interventions for adolescents with substance abuse and co-morbid psychiatric disorders. In P. M. Monti, S. M. Colby & T. A. O'Leary (Eds.), *Adolescents, alcohol, and substance abuse: Reaching teens through brief interventions* (pp. 275-296). New York, NY: Guilford Press.
- Naar-King, S., Parsons, J. T., Murphy, D., Kolmodin, K., & Harris, D. R. (2010). A multisite randomized trial of a motivational intervention targeting multiple risks in youth living with HIV: Initial effects on motivation, self-efficacy, and depression. *Journal of Adolescent Health, 46*, 422-428.
- National Institute on Drug Abuse. (2010). Monitoring the future study: Trends in Prevalence of various drugs for 8th graders, 10th graders, and 12th graders, 2006-2009. U. S. Department of Health and Human Services. Retrieved from <http://nida.nih.gov>
- Niaura, R. (2000). Cognitive social learning and related perspectives on drug craving. *Addiction, 95*, 155-163.
- Nikoletti, P. & Taussig, H. N., (2006). Outcome expectancies and risk behavior in maltreated adolescents. *Journal of Research on Adolescents, 16*, 217-228.

- Oei, T. P. S., Hasking, P., & Phillips, L. (2007). A Comparison of general self-efficacy and drinking refusal self-efficacy in predicting drinking behavior. *The American Journal of Drugs and Alcohol Abuse*, *33*, 833-841.
- Patten, C. A., Decker, P. A., Dornelas, E. A., Barbagallo, J., Rock, E., Offord, K. P., Hurt, R. D. & Pingree, S. (2008). Changes in readiness to quit and self-efficacy among adolescents receiving a brief office intervention for smoking cessation. *Psychology, Health, & Medicine*, *13*, 326-336.
- Prochaska, J. O., Diclemente, C. C., & Norcross, J. C., (1992). In search of how people change: Applications to addictive behaviors. *American Psychologist*, *47*, 1102-1114.
- Richards, S. B., Taylor, R. L., Ramasamy, R., & Richards, R. Y. (1999). *Single subject research: Application in educational and clinical settings*. Belmont, CA: Wadsworth Cengage Learning.
- Rosengren, D. B. (2009). *Building motivational interviewing skills: A practitioner workbook*. New York: Guilford Press.
- Sampl, S. & Kadden, R. (2001). Cannabis youth treatment series: Motivational enhancement therapy and cognitive behavioral therapy for adolescent cannabis users. (DHHS Publication No. (SMA) 01-3486). Washington, DC: U.S. Dept. of Health and Human Services.
- Schrier, L. M. (2010). Social Cognitive models of drug use etiology. In Schrier, L. M. (Ed.), *Handbook of drug use etiology* (pp. 167-192). Washington, DC: American Psychological Association.

- Schulenburg, J., Maggs, J. L., Steinman, K. J., & Zucker, R. A. (2001). Development matters: Taking the long view on substance abuse etiology and intervention during adolescence. In P. M. Monti, S. M. Colby & T. A. O'Leary (Eds.), *Adolescents, alcohol, and substance abuse: Reaching teens through brief interventions* (pp. 19-57). New York, NY: Guilford Press.
- Scoyoc, J. V., Stanger, C., & Budney, A. J. (2009). Treatment for adolescent marijuana abuse and dependence. *The Brown University Child and Adolescent Behavior Letter*, 25, 1058-1073.
- Slavet, J. D., Stein, L. A. R., Colby, S. M., Barnett, N. P., Monti, P. M., Golembeske, C., & Lebeau-Craven, R. (2006). The marijuana ladder: Measuring motivation to change marijuana use in incarcerated adolescents. *Drug and Alcohol Dependence*, 83, 42-48.
- Sobell, L. C., & Sobell, M. B. (2011). *Group therapy for substance use disorders: A motivational cognitive-behavioral approach*. New York, NY: Guildford Press.
- Stein, L. A. R., Colby, S. M., Barnett, N. P., Monti, P. M., Golembeske, C., & Lebeau-Craven, R. (2006). Effects of motivational interviewing for incarcerated adolescents on driving under the influence after release. *The American Journal on Addictions*, 15, 50-57.
- Stoil, M. J., & Hill, G. (1996). *Preventing substance abuse: Interventions that work*. New York, NY: Plenum Press.
- Substance Abuse and Mental Health Services Administration. (2008). National survey on drug use and health: Trends in substance use, dependence or abuse, and treatment among adolescents: 2002-2007. Retrieved from <http://oas.samhsa.gov>

- Substance Abuse and Mental Health Services Administration. (2009). Treatment episode data set report: School system referrals to substance abuse treatment. Retrieved from <http://oas.samhsa.gov>
- Terry-McElrath, Y. M., O'Malley, P.M., & Johnston, L. D. (2009). Reasons for drug use among American youth by consumption level, gender, and race ethnicity: 1976-2005. *Journal of Drug Issues, 22*, 677-714.
- Thush, C., Wiers, R. W., & Moerbeek, M. (2009). Influence of motivational interviewing on explicit and implicit alcohol-related cognition and alcohol use in at-risk adolescents. *Psychology of Addictive Behaviors, 23*, 146-151.
- Urban, R. & Demetrovics, Z. (2010). Smoking outcome expectancies: A Multiple Indicator and Multiple Cause (MIMIC) model. *Addictive Behaviors, 35*, 632-635.
- Van Zundert, R. M. P., Nijhof, L. M., & Engels, R. (2009). Testing social cognitive theory as a theoretical framework to predict smoking relapse among daily smoking adolescents. *Addictive Behaviors, 34*, 281-286.
- Wachtel, T., & Staniford, M. (2010). The effectiveness of brief interventions in the clinical setting in reducing alcohol misuse and binge drinking in adolescents: A critical review of the literature. *Journal of Clinical Nursing, 19*, 605-620.
- Winters, K. C. (2001). Assessing adolescent substance use problems and other areas of functioning: State of the art. In P. M. Monti, S. M. Colby & T. A. O'Leary (Eds.), *Adolescents, alcohol, and substance abuse: Reaching teens through brief interventions* (pp. 80-108). New York, NY: Guilford Press.

Winters, K. C., Leitten W., Wagner, E., & Tevyaw, T. (2007). Use of brief interventions for drug abusing teenagers within a middle and high school setting. *Journal of School Health, 77*, 196-206.

Young, R. M., Hasking, P. A., Oei, T. P. S., & Loveday, W. (2007). Validation of the Drinking Refusal Self-efficacy Questionnaire-Revised in an adolescent sample (DRSEQ-RA). *Addictive Behaviors, 32*, 862-868.