The Feasibility, Acceptability, and Effectiveness of a School-Based Motivational Interviewing Intervention for Adolescent Females

Vanessa Durand

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THE FEASIBILITY, ACCEPTABILITY, AND EFFECTIVENESS OF A SCHOOL-BASED
MOTIVATIONAL INTERVIEWING INTERVENTION FOR ADOLESCENT FEMALES

A Dissertation
Submitted to the School of Education

Duquesne University

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

By
Vanessa A. Durand, MSEd

August 2015
THE FEASIBILITY, ACCEPTABILITY, AND EFFECTIVENESS OF A SCHOOL-BASED MOTIVATIONAL INTERVIEWING INTERVENTION FOR ADOLESCENT FEMALES

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ABSTRACT

THE FEASIBILITY, ACCEPTABILITY, AND EFFECTIVENESS OF A SCHOOL-BASED
MOTIVATIONAL INTERVIEWING INTERVENTION FOR ADOLESCENT FEMALES

By
Vanessa A. Durand, MSEd
August 2015

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

Motivational Interviewing (MI) is an evidence-based therapeutic approach shown to elicit behavior change in adolescents engaged in risky behavior. MI is used to increase the individuals feeling of self-efficacy and outcome expectancy. Female adolescents engaged in substance use, sexual activity and identified as academically disengaged were provided an MI intervention in their alternative education setting. According to the Social Cognitive Theory, MI is well suited toward supporting individual behavior change. Results showed that MI is an acceptable intervention to at-risk adolescent females. However, feasibility considerations highlighted the implementation barriers present in this alternative high school as well as those in public school settings. Due to an unacceptably high attrition rate, results on MI effectiveness were inconclusive. Future research should focus on prevention and intervention programs that can be implemented with fidelity in alternative and general school settings.
DEDICATION

This dissertation is dedicated to all of the adolescent females who are faced with the barriers and demands of their communities and our society. Despite these difficulties, please believe in yourselves; know that you have people in your corner who want you to succeed and know that you will persevere. You are beautiful inside and outside, and have a lot to offer this world.

This dissertation is also dedicated to the adolescent females who participated in the study. Thank you for participating, allowing the research assistants and myself into your lives, and trusting us with sensitive information. Without your willingness to participate, we would not have been able to complete this study. With your assistance, we will hopefully better the supports and services for other females like you. Thank you!
ACKNOWLEDGMENT

First of all, I thank my graduate advisor and dissertation chair, Dr. Tammy Hughes, for believing in me since day one. From the first day we met, I had it set in my mind I was going to help students at-risk; specifically, adolescent females. You made sure to provide me with every experience I needed to do exactly that. You went above and beyond to make sure I had all the supports I needed to be successful in the program and to become the school psychologist I am today. I know this study was not the easiest to implement. At times, it felt like it was too much, but you continued to encourage and help me overcome all the barriers along the way. I thank you for paving the road for me in order to successfully complete this and my graduate education.

To my committee, Drs. Alison Colbert, Gibbs Kanyongo, Bryson Bresnahan, and Scott Graves, I thank you. Beyond my dissertation, the four of you have influenced me personally, professionally, and in more ways than I can articulate. While my experiences with each of you over the past five years have been vastly different, it is because of these various experiences and mentorship you gave me that I am a well-rounded scientist practitioner. I am honored to be able to officially call all of you colleagues, even though I'll forever look at you all as my mentors.

Thank you to the research assistants who helped me with this study, Cassandra Berbary and Corrine Garland. Without the two of you, there is no possible way that I could have completed this study. You approached this study with great integrity. I appreciate the hard work, committed time, and your relationships with the participants; it was evident that you were passionate about serving these females. You two are amazing and I have no doubt that you will better the lives of those you serve just by being a part of them.
Thank you to my family and friends. For the past five years, graduate school has taken up all of my time and because of that, my time spent with you was limited. Despite that, you all have supported and encouraged me along this path. You always believed in me and provided me with encouraging words when I was discouraged. If there is one thing I have learned from you all, it is the idea of unconditional love and support. Thank you.

Lastly, I could not have done this if it were not for the best man I know, my partner, Tyler Schmitz. You have been a part of this crazy beautiful journey since day one. You have been my number one fan, and always reminded me that I should never give up and that I should have confidence in myself. You are a beautiful human being. Among the many of your good qualities, you are hardworking and motivated. Watching you during these five years accomplish your goals only pushed me to continue accomplishing mine. Thank you for being you. And I know that I am in forever debt with you for dinners, chores, and nights where you can be crabby for no apparent reason. Thank you for being you and allowing me love you.
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Chapter I: Introduction

Adolescence is a developmental period that consists of intense and rapid changes. Following infancy, adolescence is the second most extensive and intensive developmental period (Silbereisen & Kracke, 1997; World Health Organization, 2010). Adolescence involves changes in physical, cognitive, emotional, and social development (Adams, 2005; Jessor, 1991; Spear, 2000). These developmental changes cause adolescents to have interest and engage in new behaviors, and require engagement in new behaviors that he or she may not be confident in performing. In addition to expected maturational changes, adolescents naturally begin testing limitations and engaging in risky behaviors. Although risk taking is common and expected in adolescence (Chick & Reyna, 2012; Spear, 2000), most adolescents, who engage in risky behaviors, do not create habits of the behaviors. On the other hand, some of the risky behaviors have detrimental consequences and can develop into problematic pattern behaviors (Adams, 2005). Risky behaviors include, but are not limited to, substance use, sexual activity, and academic disengagement.

The Center of Disease Control and Prevention (CDC; 2014) surveyed 13,583 adolescents enrolled in 9th to 12th grade using the 2013 Youth Risk Behavior Surveillance (YRBS). The YRBS measures a variety of youth risk behaviors including substance use and sexual activity. Results of the 2013 YRBS indicate high, yet variable, involvement in substance use and sexual activity for United States youth. Specifically, when reviewing female adolescents’ involvement in substance use, many females reported that they experimented with some sort of substance. Of the females surveyed, 67.9% tried alcohol, 39.2% tried marijuana, and few have tried cocaine, inhalants, ecstasy, heroin, methamphetamine, hallucinogens, and prescription drugs not prescribed to them (4.5%, 10.0%, 5.5%, 1.5%, 3.0%, 5.5%, and 17.2%, respectively). Female
adolescents’ engagement in substance use varies depending on the substance. However, at least two thirds of the adolescent females have tried alcohol while over one third have tried some sort of substance indicating high prevalence of adolescent use. Despite efforts to decrease substance use by providing educational programming, the most used, like D.A.R.E., are not shown to be effective (West & O’Neal, 2004).

Not only are female adolescents engaging in substance use, they are also engaging in sexual activity. Adolescent females begin having sexual desires as their bodies biologically mature and as others express sexual interest in them. This interaction between internal desires and external demands can influence females to engage in sexual activity. In the previous mentioned YRBS survey (CDC, 2014), 46.0% of the females reported that they have engaged in sexual intercourse; and of them, 3.1% engaged in sexual intercourse before the age of 13. One third of the females were currently sexually active at the time of the survey. That makes at least a third of the female adolescent population sexually active. Early sexual activity comes with extremely negative consequences. Myers, Landau and Sylvester (2008) found that early sexual initiation is related to unplanned pregnancies and sexually transmitted diseases. In 2012, more than 300,000 adolescent females gave birth (Martin, Hamilton, Osterman, Curtin, & Mathews, 2013) and in that same year, over ten million new STI cases were identified in adolescents (CDC, 2013b). In the YRBS, 53.1% of the sexually active female adolescents did not use a condom in their last sexual intercourse. Yet, 85.8% of the female adolescents in the YRBS reported that they were taught about Human Immunodeficiency Virus (HIV) and Acquired Immunodeficiency Syndrome (AIDS) in school (CDC, 2014). Female adolescents are not only engaging in sexual activity at a moderate rate, but they may also be experiencing negative consequences from engaging in sexual activity.
Sexual activity and substance use are not isolated behaviors. Many adolescents are engaged in both, if they engaged in one at an early age (Floyd & Latimer, 2010; van Gelder, Reefhuis, Herron, Williams, & Roeleveld, 2011). These behaviors can occur simultaneously or separately during the course of adolescence. Hipwell, Stepp, Chung, Durand, and Keenan (2012) found that earlier engagement in alcohol use was related to earlier risky sex taking. The CDC (2014) found that 19.3% of the female adolescents surveyed, reported being under the influence of either drugs and/or alcohol before their last sexual intercourse. In 2001, Poulin and Graham, found that 38% of sexually active students had unplanned intercourse while under the influence. It is evident that sexual activity and substance use are related; however, the relationship of these risk behaviors with other risk behaviors is variable.

One risk behavior that educational providers need to prevent and intervene on is academic disengagement. Student attendance, participation, and task completion are reflective of academic engagement. The less students are involved in these behaviors the more they are considered to be academically disengaged. A variety of variables affect academic engagement including family, school, economic, and student factors (Baker, Sigmon, & Nugent, 2001). A low level of attendance is highly negatively correlated with substance use. Students who are often truant or have chronic absences are engaged in substance use more than those who are not (Henry & Thronberry, 2010). These students who are chronically absent also have higher incidences of school dropout, repeated grades, and lower grades than students who attend school (Heilbrunn, 2007). However, despite the negative effects of truancy, Snyder and Dillow (2013) found that the national daily attendance (as percent of enrollment) was 91.1% for high school students. Thus, indicating that a nationally, as a whole, a small amount of students are at risk for negative effects of truancy. But this study did not look at high risk areas.
Research examining the direct relationship between sexual activity and academic engagement is sparse. However, for the studies that have measured the relationships between these variables they often did not control for confounding variables, such as substance use. For example, Metzler, Noell, and Biglan (1992) found that sexual risk-taking was significantly correlated with academic failure. This is further supported by Jiang, Mermin, Perry, and Hesser’s (2013) findings that adolescents engaged in risky sex were more likely to receive failing grades. Both previously mentioned studies report significant relationships between academic failures with other risk behaviors. Indicating that academic engagement or success may be influenced by multiple factors such as risky sexual activity and substance use.

**Significance of Problem**

Despite being educated and informed about the negatives consequences that stem from risky behaviors, adolescents are still engaging in these behaviors at concerning rates. Therefore, there needs to be a more effective way of helping adolescents refrain from risky behavior. First, understanding why adolescents engage in certain behaviors needs to be explored. Alfred Bandura’s Social Cognitive Theory (SCT; Bandura, 1986) helps establish a foundation for understanding why individuals engage in specific behaviors. The SCT focuses on three main factors that affect adolescent behavior: behavior, environmental events, and personal variables. These factors are interrelated and affect each other in what is known as the Triadic Reciprocal Causation Model. For example, an adolescent engages in different behaviors depending on the environment they are in such as school versus when they are unsupervised and with friends. This triadic reciprocal relationship influences how an adolescent considers their behavior options in each situation.
A personal factor in which Bandura (1986) emphasizes as one of the most important factors in the basis of behavior is self-efficacy. Self-efficacy is the confidence and belief in the ability to engage in a behavior. Self-efficacy is affected by the outcome beliefs, or the cognition that the desired outcome of a behavior will actually occur (Bandura, 1986). Adolescents need to have confidence in their behavior and believe that if they engage in that behavior they will achieve their goal. It is important to note that self-efficacy is context specific; meaning, that when thinking about the behavior and the outcomes it needs to be in relation to a specific situation, environment, and time. Providing an adolescent with information and knowledge about why they should or should not engage in the behavior does not instill self-efficacy or the outcome belief in specific behaviors. Adolescents need to practice techniques related to safe behaviors in order to apply the learned information. This can be done through tactics such as goal setting. Adolescents also need to have experiences where that goal is achieved and the consequence they desire occurs. Techniques used to strengthen self-efficacy are through mastery experiences (previously mentioned), modeling, social persuasion, and physiological states (Wood & Bandura, 1989). Each of these techniques allow for an adolescent to take advantages of the relationships in the Triadic Reciprocal Causation Model because each factor (i.e., behavior, environment, and personal factors) is an important component in each of the technique. The concepts of self-efficacy and outcome expectancy, the techniques used to promote both of these concepts, and the use of self-identified motivations, all need to be incorporated into psychoeducational and/or counseling programs.

Miller and Rollnick (1991) developed a client-centered therapeutic approach that elicits behavior change by identifying the motivations of a client and capitalizing on those motivations to guide the client through change. Many times adolescents have conflicting thoughts about
behavior change such as the motivations to change, the confidence and belief they can change (self-efficacy), the belief they can obtain the desired outcome (outcome expectancy) or even the need to change at all. Motivational Interviewing (MI; Miller & Rollnick, 1991) was designed to integrate all of those factors and help adolescents change. MI can help an adolescent along the change process by eliciting from them motivations to change and by creating guiding therapeutic goals.

MI capitalizes on an adolescent’s ambivalence to change. When someone is ambivalent about change they typically have reasons to want to change and to not want to change. Using strategic therapeutic techniques, MI elicits self-resolution and increases self-efficacy of the behavior in question by shifting the adolescent’s cognitions about change. However, MI is based primarily in the communications between the therapist and the client by using a guiding and strategic communication style. MI has the goal of enhancing self-efficacy, and creating behavior change through goal setting specifically by the individual and not the therapist. This is an important piece in solving ambivalence as it allows the adolescent to take ownership of their motivations to change and their success and failures.

Motivational Interviewing has shown significant and promising effects with a variety of populations and behavioral problems. A meta-analysis demonstrated the effectiveness of MI with adolescents and adults who are engaging in risky health behaviors such as substance use and risky sexual activity (Burke, Arkoqitz, & Menchola, 2003; Dunn, Deroo, & Rivara, 2001; Hettema et al., 2005). Research has shown that MI-based interventions can decrease adolescent cigarette smoking (Audrain-McGovern et al, 2011; Colby et al., 2005; Kelly & Lapworth, 2006). Not only has research demonstrated that adolescent cigarette smoking decreases with the use of MI, but it has also shown to decrease the use of alcohol use. Spirito and colleagues (2004) found
that adolescents who were emergency room patients due to drinking related incidents and who were enrolled into a brief MI treatment had significantly decreased their drinking when compared to alcohol using adolescents who received standard care in the emergency room.

Specific to sexual behaviors, Chen, Murphy, Naar-King, and Parsons (2011) used an MI-based intervention to increase condom use for adolescents who were Human Immunodeficiency Virus (HIV) positive. The intervention helped maintain condom use of those who were already using them at a high rate and increased condom use for those who were using them infrequently. MI interventions have been designed to simultaneously intervene on sexual activity and substance use. Naar-King and colleagues (2006) intervened on alcohol use, marijuana use and unprotected sexual acts. It was found that the intervention increased condom use, but did not affect substance use. Mason, Pate, Drapkin, and Sozinho (2011) integrated MI with a social networking platform in their intervention to decrease substance use and sexual activity behavior of African American adolescent females. The intervention decreased alcohol use in general and alcohol use before sexual activity. MI is effectively increases safe sexual acts and decreases substance use for adolescents.

Currently, research on the effectiveness of MI with adolescent academic engagement is sparse. MI has been shown to increase academic participation and positive academic behavior related to math (Strait, Smith, McQuillin, Terry, Swan & Malone, 2012; Terry, Smith, Strait, & McQuillin, 2013). However, these studies showed that MI did not increase homework completion or academic self-efficacy. Similarly, Enea and Dafinoiu (2009) found that an MI intervention led to a significant decrease in truancy rates for at-risk students. Despite the minimal research in this area, it is proposed MI can positively affect academic engagement. As mentioned earlier, substance use, sexual activity, and academics are all related whether
positively or negatively. Therefore, it is predicted that an MI intervention can effectively change adolescent academic engagement.

As most MI interventions have been implemented in hospitals, emergency departments, college campus, or traditional high schools (Audrain-McGovern et al., 2011; Dermen & Thomas, 2011; Kelly & Lapworth, 2006; Mason et al., 2011; Spirito et al., 2004), the feasibility and acceptability of implementing an MI intervention in an alternative high school with at-risk adolescents needs to be examined. Yeagley, Kulbok, O’Laughlen, Ingersoll, Rovnyak, and Rana (2012) found that most of the adolescent living with HIV and who were enrolled in an MI intervention enjoyed the MI intervention over standards care. The researchers also found that the briefness of the MI intervention made the study easy to implement thus showing feasibility.

**Problem Statement**

The purpose of this study was to examine the relationships among self-efficacy and outcome expectancy of academic engagement, substance use, and sexual activity. The study was also designed to examine the feasibility, acceptability, and effectiveness of an eight week school-based MI intervention on increasing adolescent females’ self-efficacy and outcome expectancy related to substance use, sexual activity, and academic engagement. The study consisted of an MI intervention group and a control group. Both groups completed a pre-test, a nine-week posttest, and a three week follow-up posttest. The MI intervention group completed an eight week intervention after completing the pre-test and before completing the nine-week posttest. The MI intervention involved eight 35 minute individualized weekly sessions that were addressed the major areas of concern (i.e. substance use, sexual activity, and academic engagement). The primary dependent variables were measured over three data collection periods
and the intervention effects on each of these variables were measured. Actual substance use, sexual activity, and academic engagement behavior were also analyzed as secondary variables.

**Research Questions and Hypotheses**

**Research Question One**

How are academic engagement, substance use, and sexual activity self-efficacy and outcome expectancy related in adolescent females who are at-risk for or actively engaged in all three behaviors?

**Hypothesis one.** It is expected that the academic engagement, substance use and sexual activity self-efficacy and outcome expectancy are positively related.

**Research Question Two**

What is the impact of a Motivational Interviewing intervention on adolescent females’ report of self-efficacy and outcome expectancy when those youth are considered at-risk or actively engaged in substance use and sexual activity behaviors, and are academically disengaged?

**Hypothesis two.** It is expected that the Motivational Interviewing intervention will increase adolescent females’ self-efficacy and outcome expectancy in the engagement of positive behaviors relating to sexual activity, substance use, and academic engagement.

**Research Question Three**

What is the feasibility and acceptability of the designed program in a school setting?

**Hypothesis three.** It is expected that the Motivational Interviewing intervention is feasible to implement in schools and that student acceptability will be high.
Chapter II: Literature Review

There are a multitude of changes and transitions that occur in adolescence. Adolescents are faced with new internal and external demands that require a large and varied behavior repertoire. These include biological, cognitive, social, and emotional changes as well as new environmental demands. Each of these changes and demands require specific skill sets that lead to successful transitions during adolescence. Some adolescents may lack confidence in using the skills that they do have while others may simply choose to test the relevance of their skill sets. Educators and caregivers provide advice on expected appropriate behavioral decisions (e.g., it is important to attend school and complete your homework, do not use drugs, and do not engage in sexual activity). Despite adequate direction, adolescents do not always yield to this advice. Therefore, the solution is not to increase adolescents’ knowledge about prosocial behaviors, but rather, to provide them opportunities to discuss self-identified motivations to engage in positive behaviors and to practice this engagement in order to increase their self-efficacy.

The purpose of this chapter is to describe the appropriateness of applying a therapeutic approach, Motivational Interviewing (MI), with adolescents in order to enhance their self-efficacy in target behaviors. Specifically, to enhance their self-efficacy in academic engagement, increase their self-efficacy in refraining from engagement in risky behaviors, and increasing their beliefs that they can obtain the desired outcome of their behavior. The theoretical framework provided to explain adolescent behavior is Alfred Bandura’s Social Cognitive Theory (SCT; 1986). Following is a discussion of the way in which SCT can be theoretically integrated with MI. Empirical evidence of MI’s effectiveness in changing adolescents’ self-efficacy and behavior will then be provided.
Theory Relevant to Research Questions

Social Cognitive Theory

Adolescents engage in a variety of behaviors. Some of these behaviors can lead to positive outcomes, while others can have detrimental consequences. In order to assist with adolescents’ engagement in appropriate behaviors, it is imperative that educators and caregivers understand the factors affecting adolescent behavior. The Social Cognitive Theory (Bandura, 1986) describes how adolescents learn and maintain behaviors. Bandura (1986) identifies factors that affect human behavior. These factors include behavior, environmental events, and personal variables (i.e., cognition, affect, and biological events). Bandura (1986) emphasizes the relationships between these factors in the Triadic Reciprocal Causation Model. This model accentuates that all factors interact and influence each other bi-directionally (Bandura, 1986).

For example, an adolescent who has thoughts about drinking and is in an environment where there is alcohol may choose to drink. Once the adolescent engages in drinking, the adolescent’s cognitions and behavior are reinforced, and he or she may have thoughts about future drinking. This relationship between the personal factor (cognition) and the environment influences the adolescents’ current and future behavior. It is known as reciprocal determination, and is an important factor in the Triadic Reciprocal Causation Model. The reciprocal relationship is not always automatic, like in the given drinking example, and each relationship varies in its strength. Many times these relationships take time and have to reoccur in order to be established (Wood & Bandura, 1989). The relationships’ strengths, durations and frequencies are important to consider when influencing adolescents’ behavior.

Adolescents’ behaviors are highly influenced by their own cognitions and behaviors as well as by their environment. Typically, adolescents do not have control over their environment.
and its associated demands. Adolescents have opportunities to engage in specific behaviors contingent on the surroundings, and have opportunities to learn behaviors through observation in their environment. Adolescents observe others in their environment and emulate others’ behaviors in order to obtain a desired outcome. The effects of observational learning are remarkable when adolescents observe others, like themselves or whom they idolize, receive desired outcomes from their behaviors (Bandura, 1986). Therefore, not only can the environment provide opportunities to engage in behaviors, it can also provide opportunities to observe the behaviors that are desired and reinforced in that setting (Wood & Bandura, 1989). Adolescents can become products of their environments unless they are taught the skills to successfully adapt to it and maneuver within it (Bandura, 1997). Bandura (1986) emphasizes the importance of having the knowledge and skills that influence behavior or possessing a behavioral capability. Adolescents can take an active role in determining what happens in their own lives. Each adolescent has personal factors that lead them to engage and interact with their environment differently from their peers. This interaction affects and shapes their future behaviors.

Bandura identifies specific personal factors, self-regulatory mechanisms, which have particular influence on behavior; specifically, self-efficacy (Bandura, 1986, 1997, 2004; Wood & Bandura, 1989). Adolescents need to gain self-efficacy within the context of their environment and cognitive, affective, and biological changes (Bandura, 2006a). Bandura (1997, pp. 3) defines self-efficacy as “the belief in one’s capabilities to organize and execute the course of action required to produce given attainments,” and claims that it is the foundation of adolescent motivation and intentional behavior (Bandura, 2002). Zimmerman (1995) furthers this by focusing on the context of the behavior and states that self-efficacy is an individual’s belief that
he or she has the ability to complete a context-specific task based on the skill set needed for that task. An important aspect of self-efficacy is the confidence in which an adolescent has in order to engage in a behavior and the belief that he or she will obtain that outcome (outcome expectancy). Adolescents need to believe that they are capable of completing tasks in order to achieve an identified goal, and that outcome is attainable. In summary, adolescents not only need to have the skill set for the behaviors, but also, they must believe they have the capability to engage in those behaviors in order to control the events in their lives (Wood & Bandura, 1989).

Bandura (1997) identifies self-efficacy as one of the most important conditions for behavior change. Bandura suggests that self-efficacy is influenced by an individual’s environment, personal characteristics, and previous behaviors; aforementioned as the Triadic Reciprocal Causation Model. One of the biggest factors affecting self-efficacy is an individual’s cognitions; the individual needs to believe that he or she can achieve identified goals in order to change his or her behavior. In order for an adolescent to be intrinsically or extrinsically motivated and successfully engage in a specific behavior, the adolescent must also believe he or she is able to conduct the behavior and receive the outcome he or she desires (Bandura, 1997). Self-efficacy can drive an adolescent’s choice of activities and environments while it can lead to avoidance of others (Wood & Bandura, 1989). Adolescents who believe they can effectively maneuver in a specific environment tend to gravitate to those environments especially when they identify with others who are successful in that environment (Wood & Bandura, 1989). Self-efficacious individuals are able to take advantage of this triadic, reciprocal, and deterministic relationship by engaging in behaviors that produce the desired consequences from their environment.
Wood and Bandura (1989) suggest four principles (i.e., mastery experiences, modeling, social persuasion, physiological states) that instill and strengthen self-efficacy. Mastery experiences are situations in which a person is able to engage in a behavior successfully. Mastery experiences allow for adolescents to have experience success in order to gain self-efficacy in that behavior. Adolescents who experience failures, but have more mastery experiences, benefit from those failures. Successful experiences provide confidence and at times overconfidence, which can create unrealistic expectations. While, unsuccessful experiences allow for the chance to persevere and increase self-efficacy (Wood & Bandura, 1989). Repeated successes, paired with failures, allow for a more realistic perception of self-efficacy and a stronger ability to persevere in times of failures. It is important adolescents to experience both successful and unsuccessful experiences.

The principle of modeling refers to adolescents learning from observing the successes and failures of others and comparing those behaviors to their own behaviors. By comparison, the modeling drives knowledge of an adolescent’s own capabilities and can either strengthen or weaken self-efficacy based on the similarity between them and the person of observation (Wood & Bandura, 1989). This is emphasizes the relationship of observational learning (environment) and behavior. The concept of modeling and observational learning was previously discussed as an example of the Triadic Reciprocal Causation Model.

Wood and Bandura (1989) state that social persuasion (i.e., social encouragement) is crucial when the encouragement is realistic, accurate, and based on an adolescent’s actual capabilities. When the encouragement is realistic, accurate, and based on the adolescent’s capability, it eliminates self-doubt. This encouragement utilizes the reciprocal relationships between personal factors and the environment. The adolescent accurately perceives his or her
own personal factors and social relationships, and therefore, increases his or her self-efficacy in his or her behaviors. Wood and Bandura (1989) state that this encouragement should be focused on self-improvement and not successes over others, otherwise, it is not emphasizing an individual’s self-efficacy.

The principle of physiological states refers to an adolescent’s ability to be in tune with his or her body (e.g., arousal, tension), and respond accordingly. In cases of failure and success, bodies react differently. Failure can lead to somatic responses (e.g., fatigue) that may lead people to lower their self-efficacy as they believe they are incapable of completing a task (Wood & Bandura, 1989). Increasing an adolescent’s understanding of his or her physical states and responses to situations can assist in a better understanding of his or her capabilities and therefore increase self-efficacy. All of these principles are important to consider when intervening on adolescents self-efficacy level. However, adolescent development has to be considered when considering the effectiveness of the principles.

**Adolescence**

Adolescence is time in which both individual and contextual changes are rapid and pervasive. These include neurocognitive changes (i.e., executive functioning), pubertal changes ending in secondary sex characteristics, emotionally charged relationships, and social expectations such as mature adult behaviors (Bandura, 2006a; Jesser, 1991; Miller & Rollnick, 2002; Spear, 2000). Some of the changes included are physical, psychological, cognitive, neurological, and social. The World Health Organization (2010) defines adolescence as the time period from age 10 to 18 years old. Although infancy and childhood are also times of rapid development, they differ from adolescence as adolescents are more aware of their physical and psychological changes than are infants and children (Silbereisen & Kracke, 1997; World Health
Organization, 2010), and there are neurological differences between children and adolescents that affect their cognition and behaviors (Casey & Jones, 2010). Adolescent development is multifaceted and complex, therefore, can affect self-efficacy and behavior decisions in a variety of ways.

**Physical Development**

As children develop into adolescents, they begin to mature physically. Puberty arrives for both males and females with a variation in timing and onset. Females begin puberty between the ages of 10 to 12 as males begin puberty between the ages 12 to 14 (Adams, 2005; Meyers, Landau, & Sylvester, 2008). Along with puberty comes an emotional, psychological and social impact. Adolescents’ hormones and sexual interests start to change. Early and late onset of puberty and physical maturation can negatively affect the other adolescent developmental areas. Adams (2005; Spear, 2000) argues that attention needs to be focused on early and late puberty due the negative effects on an adolescent’s psychological, social, and emotional development. For example, adolescent females who mature early are at-risk for substance abuse, Oppositional Defiant Disorder, and eating disorders (Adams, 2005). Moreover, puberty affects emotional, psychological, social and sexual development.

**Cognitive Development**

As children begin to cognitively develop, their intellectual functioning begins to change. Their thinking progresses from being concrete to being more abstract (Adams, 2005). By adolescence, they should be able to focus on abstract thoughts and relationships among abstract ideas as well as begin to have futuristic ideas. They are able to connect decisions and consequences. Without the development of this thinking pattern, an adolescent is at a disadvantage to thoroughly make appropriate decisions. The absence of this cognitive ability
will leave a youth functioning at less adaptive levels as they are unable to think abstractly and problem solve (Adams, 2005). It is important for adolescents to make this change in thinking patterns, especially when confronted with high risk behavior choices. These changes can positively affect the adolescent’s level of self-efficacy if he or she is provided with appropriate opportunities to change his or her thoughts as well as associate cause and effect relationship between behaviors and outcomes.

**Emotional Development**

An important aspect of emotional development is the mastery of emotional skills or emotional regulation. Important emotional skills included the ability to regulate intense and ambivalent emotions, use coping skills, be aware of one’s own emotions while not being overwhelmed by them, understand the consequences of emotions for others, manage emotional arousal regarding empathy and sympathy, and learn how to manage feelings in relationships with the opposite sex (Adams, 2005). Emotional development includes that of an adolescent’s self-esteem and self-evaluation. As stated earlier, the physiological state and the understanding of it can highly influence self-efficacy. Both aspects are affected by the child’s environments such as school, family, and friends (Meyers et al., 2008). Another reciprocal relationship is that adolescents’ emotional development is also affected by their cognitive and physical changes.

**Social Development**

Family closeness and attachment is a major factor in predicting adolescent adjustment and engagement in unhealthy behaviors (Adams, 2005). Parents, who have an authoritative parenting style, monitor their adolescents’ behaviors, set boundaries, and are warm and receptive, increase the adolescent’s ability to resist peer pressure (Siegler, DeLoache, & Eisenberg, 2011). However, peer groups influence adolescents by being a source of information
about the world outside of the family (Adams, 2005). Despite their relationships with their parents, adolescents learn a lot from their peers, such as high risk behaviors like engaging in sex, using drugs, and disengaging from academics.

Peer relationships are very important to adolescents (Spear, 2000). Peer relationships differ between genders. Males tend to engage in more action-oriented activities and females tend to have more intimate time for talking and “gossiping”. However, both sexes desire trustworthiness and loyalty (Adams, 2005). Even though there are sex differences in interests, opposite sex friendships occur in adolescence. Youth generally interact with same sex peers until about 8th to 11th grade, when they start interacting with opposite sex peers (Arndorfer & Stormshak, 2008). However, throughout development, children and adolescents tend to interact with peers who have similar interests despite their sex (Siegler et al., 2011). This affects social persuasion, modeling, and the adolescents choosing environments in which they are interested in.

**Role Transitions**

These developmental changes also come with variety of role transitions. Adolescents begin to make independent decisions regarding school, jobs, relationships, and lifestyle choices (Schulenberg, Maggs, Steinman, & Zucker, 2001). As previously mentioned, there are abstract and futuristic cognitions that affect their decision making related to these transitions. Also, adolescence is a time of gaining autonomy from parents as adolescents gain more privacy and freedom, which provides opportunities to make decisions on their own (Schulenberg et al., 2001). Social activities begin to gain complexity, as adolescents are socializing in larger groups, acquiring new responsibilities, and are increasingly responsible for their own behaviors (Bandura, 2006a). Adolescents are beginning to develop autonomy and self-identity which may require pushing boundaries and limitations.
Miller and Rollnick (2002) state that at times, this requires adolescents to question and be defiant towards adult figures and society who have always instructed them what to do. For some adolescents, this defiance and questioning can lead to problematic behavior such as sexual activity, substance use, and disengagement from school. These risky behaviors can be linked to health (i.e., chronic illnesses) and safety (Jessor, 1991), and are also interrelated (Brener & Collins, 1998; Donovan, Jessor, & Costa, 1993). However, testing boundaries can lead to the development of internal control of their behavior and increased self-efficacy (Jessor, 1991).

Along with this autonomy and ability to make independent decisions comes the increased chance of engaging in risky behaviors. As adolescents begin to make their own choices based upon their own interests and desires some of them chose to engage in risky behaviors (World Health Organization, 2010). Adolescents’ behaviors combined with their cognitive, emotional, and social development can lead to disturbing outcomes. According to the Centers of Disease Control and Prevention (CDC; 2011), the primary causes of mortality and morbidity during adolescence are related to preventable factors including substance use. Understanding the frequency, duration, and types of risky behaviors and how self-efficacy plays into these behaviors are important for identifying when and how to intervene.

**Risky Behavior**

Risk-taking is common and expected in adolescence (Chick & Reyna, 2012; Spear, 2000). Most adolescents experiment with behaviors that can be considered risky; however, in most cases, the adolescents naturally disengage from those behaviors. Adolescents typically engage in risk-taking behaviors (Spear, 2000), but it is the adolescents who engage in behaviors with severe consequences that need effective treatment and intervention programming, and prevention of more severe behaviors. About 20% of adolescents have issues serious enough to
be classified as dysfunctional (Adams, 2005). High risk behaviors tend to occur during unsupervised time after school, in which some adolescents experiment with sex, engage in delinquent acts, or use drugs. Unsupervised time itself does not cause these behaviors, as most adolescents who are unsupervised do not engage in high risk behaviors (Adams, 2005). However, those who are engaging in those high risk behaviors are normally unsupervised. It is important to focus on the age that engagement in risky behaviors begins, the context they occur in, and the types of risky behaviors adolescents engage in (Adams, 2005).

**Substance Use**

As adolescents enter an age of multiple transitions, there is an increase in their experimentation with risk-taking behaviors such as substance use. This relates back to their desire for autonomy and limit testing. Adolescents’ engagement in substance use is variable. In 2013, the CDC (2014) conducted the Youth Risk Behavior Surveillance (YRBS), in which they surveyed 13,583 of the United States adolescents enrolled in 9th to 12th grade to assess multiple risk-taking behaviors among adolescents that lead to morbidity and mortality and that can extend into adulthood. These behaviors include substance use and sexual activity. The CDC (2014) found that 66.2% of the adolescents tried alcohol. This finding is consistent with other studies indicating that about 70% of adolescents tried alcohol by the twelfth grade (Johnston, O’Malley, Bachman, & Schulenberg, 2012). Of the 66.28% of adolescents who tried alcohol, 20.5% did so before the age of 13 (CDC; 2014). Specifically relating to females, 67.9% have tried alcohol and 16.6% of those surveyed drank alcohol before the age of 13.

Adolescents engage in other substance use other than alcohol. The CDC (2014) YRBS states that 40.7% of adolescents have tried marijuana and 39.2% of females have tried marijuana. One-fourth (23.4%) of adolescents reported currently using marijuana, and 21.9% of females are
currently using marijuana. Other substances tried by adolescents are cocaine, inhalants, ecstasy, heroin, methamphetamine, hallucinogens, and prescription drugs not prescribed to them (5.5%, 8.9%, 6.6%, 2.2%, 3.2%, 7.1%, and 17.8%, respectively). Adolescent females reported trying cocaine, inhalants, ecstasy, heroin, methamphetamine, hallucinogens and prescription drugs not prescribed to them (4.5%, 10.0%, 5.5%, 1.6%, 3.0%, 5.5% and 17.2% respectively). This in conclusion that adolescent females experiment at an early age while some experiment with more drugs and sometimes more illicit drugs than others.

Sexual Activity

Adolescents begin to have sexual desires and interests before they are able to cognitively and emotionally understand sexual activities (Bandura, 2006a). Adolescents are starting to engage in sex at an earlier age than has historically been the case. Due to negative consequences of engaging in sex, such as pregnancy, stigmas, and sexually transmitted infections (STIs), attention to this issue is needed. Adolescents gain their understanding of sex from peers and the media which often end up being misleading and can lead to negative consequences. Adolescents engage in high rates of sexual activity despite their unpreparedness and some at early ages (Bandura, 2006a). Unplanned pregnancies and sexually transmitted infections are related to early sexual behavior (Meyers et al., 2008). According to the CDC (2014) YRBS, almost half (46.8%) of the adolescents had sexual intercourse, of those, 5.6% of the adolescents had sexual intercourse before age 13 and 34% are currently sexually active (CDC, 2014). Forty six percent of females surveyed had sexual intercourse, and 3.1% of them had sexual intercourse before the age of 13. However, of those females surveyed, only 35.2% are currently sexually active (CDC, 2014). Still, one third of American female adolescents are currently engaging in sexual intercourse.
Pregnancy is also an issue among female adolescents. As stated earlier, 34% of all adolescents are currently sexually active. Of those adolescents, 59.1% are using condoms; 25.3% used birth control, Depo-Provera, Nuva Ring, Implanon, or any IUD; and 8.8% are using condoms and birth control, Depo-Provera, Nuva Ring, Implanon, or any IUD (CDC, 2014). This means that not all adolescents engaging in sex are practicing safe sex to protect from pregnancy. Of the youth surveyed, 13.7% did not use any method of birth control, and 15.7% of females did not use any method (CDC, 2014). To emphasize the need of attention to sexual activity, in 2012, more than 300,000 adolescent females between the ages of 15 and 19 gave birth (Martin, Hamilton et al., 2013). That statistic does not include the number of miscarriages or abortions for this group.

As stated before, about two thirds of the adolescents engaged in sex are using condoms during sexual intercourse. That leaves a third of the adolescents not protecting themselves from STIs. This statistic does not represent the use of condoms in all sexual activities where STIs can be transmitted, such as oral sex. Oral sex is often not seen by adolescents as sex as it does not lead to pregnancy (Johnson & Malow-Iroff, 2008). The CDC (2013b) found that nearly ten million new STIs cases each year are among young people aged 15–24 years. According to Johnson and Malow-Iroff (2008), contracting STIs is something that should also be brought to society’s and the adolescents’ attention along with pregnancy and stigmas.

A total of 84% of those adolescents were taught about AIDs and HIV infections in schools (CDC, 2014), yet due to the variability in education approaches, the information may not be presented the most effective way (i.e., absence only and comprehensive sex education). Of the adolescents surveyed, 13.2% of the females had sex with four or more people, and having multiple partners can increases the probability of transferring STIs (CDC, 2014). The statistic
may be related to the new trend of “friends with benefits”. Johnson and Malow-Iroff (2008) argue that due to adolescents beginning to engage in mixed sex groups and having increased interest in the opposite sex, sexual tension rises. Since the idea of a romantic relationship is viewed as “old-fashioned”, engagement in sex as a recreational activity has increased. This coincides with adolescent development as adolescents’ bodies are changing, their sexual interests are increasing, and their interactions with opposite sex peers are also increasing. Not being able to positively cope and manage the changes affects self-efficacy, and therefore, affects behaviors.

Despite the push for educating adolescents about sex, research shows that education alone does not discourage adolescent sexual engagement or lead to less risky sexual behaviors (Bandura, 2006a; Chin et al., 2012; Sipe et al., 2012). Bandura (1997) states that adolescents with enhanced self-efficacy engage in fewer risky sexual behaviors than those with low self-efficacy. Adolescent need the confidence to refrain from risky sexual behaviors and need to believe that refraining from the behaviors is important. It is imperative to teach adolescents skills that allow them to utilize the information they learn rather than just providing them the material. Bandura (2006a) emphasizes that the effects of social and peer pressures and heightened sexual arousal can increase sexual engagement despite adolescent sexual knowledge. Therefore, it is important to increase sexual activity self-efficacy in order to control social and emotional influences, and help equip the adolescents with skills that enable them to refrain from sex or practice safe sex consistently despite social pressures (Bandura, 2004).

**Substance Use and Sexual Activity**

Studies have shown that adolescent substance use and sexual activity are related. The CDC (2014) found that 22.4% of the adolescents and 19.3% of the female adolescents drank alcohol or used drugs before their last sexual intercourse. Poulin and Graham (2001) found that
38% of sexually active students had unplanned intercourse while under the influence. Therefore, adolescents who are using substances are found to be also engaging in sexual activity and at times are engaging in unplanned sexual activity. Alcohol, marijuana, and cocaine use were found to be linked with early sexual initiation (Floyd & Latimer, 2010; van Gelder et al., 2011). Hipwell et al. (2012) found that African American females who engaged in early alcohol use engaged in higher rates of sexual risk-taking at age 16 than European females. It is suggested that the discrepancy between races is due to race vulnerability, such as lower family income, as it is associated with higher rates of engaging in risky sex (Upchurch, Aneshensel, Sucoff, & Levy-Storms, 1999). Even though there are differences in race found, all adolescents are going through the same transitions and all are still engaging in some risk-taking behavior.

**Academic Engagement**

Success in school performance is dependent on motivation, self-management, and cognitive skills (Bandura, 2006a). Student attendance, class participation, thoughts and motivation around school are reflective of academic engagement. Baker et al. (2001) reported that family, school, economic, and student factors are related to truancy. Family factors include lack of supervision, poverty, attitude towards school, and alcohol and drug abuse. These are the same factors that influence engagement in sexual activity and substance use. School factors include inconsistent procedures dealing with truancy and attitudes of students, staff and teachers. Economic factors include single parenting, parents with multiple jobs, and employed students. Lastly, student factors consist of drug and alcohol abuse, and lack of school connectedness (Baker et al., 2001). It is evident that substance use and truancy are correlated. When students are chronically absent from school, there can be detrimental consequences. Heilbrunn (2007) found that students with chronic absences have a higher incidence of lower grades, repeated
grade levels, school dropout, expulsions, and non-completion of school than students who attend school regularly. Similarly, truant students are engaging in cigarette, alcohol, and marijuana use while they are absent significantly more than the non-truant peers (Henry & Thornberry, 2010).

There has been minimal research regarding the specific relationship between adolescent sexual activity and academic engagement. Metzler and colleagues (1992) found that sexual risk-taking was significantly correlated with academic failure. However, in the same study, substance use and antisocial behavior were also significantly correlated with academic failure indicating that the relationship between sexual risk-taking and academic failure might be confounded by another variable. As of recently, Jiang et al. (2013) found that adolescents who reported having sex were more likely to have D’s and F’s than those who did not report having sex. Unlike Meltzer et al. (1992), Jiang and colleagues controlled for other risk behaviors indicating a direct relationship between sexual activity and academic failure.

Adolescents also need to believe that the academic outcomes of their behaviors are truly obtainable. As mentioned earlier, Bandura (1986) emphasizes the confidence in engaging in the behavior and believing the outcome is truly obtainable. Focusing on the concept of self-efficacy and how environmental, social, and cognitive factors influence self-efficacy will assist in understanding and intervening on adolescent risk behavior.

**Protective Factors**

**Family Connectedness**

Aforementioned, adolescents are going through a time of drastic change. Adolescents are beginning to push away from their parents and guardians and interact more with their friends. However, Adams (2005) stated that family closeness and attachment are critical protective factors of adolescent engagement in risky behavior. Despite adolescents pulling away from their
families, their level of family connectedness affects their adjustment and shields them from engaging in risky behavior. Family connectedness is defined as an adolescent’s feelings of support and attachment to their family (Anderson, Ramo, Schulte, Cummins, & Brown, 2007; Henry, Robinson, & Wilson, 2003). Research indicates that when adolescents report high levels of family connectedness, the rates of substance use decrease. Family attachment and cohesion have a direct negative relationship with adolescent substance use such as alcohol, tobacco, and marijuana (Peterson, Buser, & Westburg, 2010; Veselska et al., 2009).

As previously mentioned, authoritative parenting style increases adolescents’ ability to resist peer pressure as these parents tend to monitor their adolescents’ behaviors, set boundaries, and are warm and receptive (Siegler et al., 2011). Likewise, it has been found that family cohesion has a direct positive relationship with adolescent perceived support which then has an indirect relationship with substance use (Henry et al., 2003). Anderson and Henry (1994) found that levels of adolescent substance use are significantly lower when higher levels of perceived communication, family bonding, and family support are reported.

Family connectedness also affects adolescent engagement in sexual activity. Resnick et al. (1997) studied the effects of family connectedness on substance use and sexual behavior. It was found that high levels of family connectedness delayed adolescent sexual activity onset. Also, parental disapproval of sexual intercourse delayed sexual intercourse. One program designed to capitalize on the family and school environment to decrease problem behavior was the Seattle Social Development Project (Lonczak, Abbott, Hawkins, Kosterman, & Catalano, 2002). This project is theoretically driven by the social learning, social control, and differential association theories and emphasizes the importance of school and family connectedness. The researchers followed 349 adolescents who were in either a control group or enrolled in the
project from 5th grade to age 21 years old. It was found that those enrolled in the project had a decrease in sexual activity, pregnancy, and STI contractions than the control group.

Academic engagement is affected by family connectedness. In the previously mentioned study by Baker et al. (2001), it was found that the lack of supervision, poverty, family attitudes toward school and family alcohol and drug use negatively affected school engagement. Pomerantz, Qin, Wang, and Chen (2011) found that adolescents who were more connected with their parents had better academic functioning. However, it is important to note that these are in families who value education and the adolescents felt it was a responsibility to the parents to do well in school. The relationship between family connectedness and academics (Baker et al., 2001), substance use (Peterson et al., 2010; Veselska et al., 2009), and sexual activity (Lonczak et al., 2002) has been well established.

**School Connectedness**

School connectedness is supported by research as a protective factor of adolescent substance use. Similarly to family connectedness, as involvement and feelings of belonging to school increase for adolescents, the likelihood of substance use decreases. Adolescents who report having low school connectedness, but good social connectedness were 2 times as likely to smoke, 1.7 times as likely to drink, and 2 times as likely to use marijuana in later years (Bond et al., 2007). This is important as noted earlier, adolescents are becoming more intimately involved with peers and therefore, their relationships become more influential on their thoughts and behaviors. When compared to adolescents with low levels of school engagement (i.e., emotional and behavioral), adolescents with higher levels of school engagement were less likely to initiate substance use or were more likely to initiate it at a later age (Li et al., 2011). The CDC (2009)
highlights the positive effects that school connectedness has on decreasing risky behaviors such as substance use.

Research on the relationships between sexual activity and school connectedness is sparse. However, the research in the field has indicated an indirect relationship between school connectedness and sexual activity. In a study of 4,218 Nigerian adolescents, it was found that students with low levels of school connectedness were more likely to have sexual intercourse (Slap, et al., 2003). Similarly, in the previous mentioned study by Resnick et al. (1997) higher levels of school connectedness were associated with late onset of sexual intercourse. In the Seattle Social Development Project, Lonczak and colleagues (2002) found that those enrolled in their program capitalizing on school connectedness had a decrease in their sexual activity and propensity to engage in risky sexual acts. These studies have begun to create the foundation of the negatively correlated relationship between sexual activity and school.

Adolescents’ school connectedness significantly affects their academic engagement. There are many school factors that affect academic engagement. Attitudes of students, staff, and teachers are some factors that affect academic engagement (Baker et al., 2011). In a study of urban middle school students, Niehaus, Rudasill, and Rakes (2012) found that when students felt less connected with and not supported by their school, their grades significantly declined. It seems appropriate that only when adolescents feel connected to school or have a belonging to school that they are more engaged in their academics. If students feel as if they do not belong in the school or have strong relationships with the school, they then tend to avoid activities related to school.

It is evident that adolescents are going through many changes that are affected by their surroundings and their own beliefs. There are a variety of new demands on them from schools,
family, and friends and balancing all of them is difficult within the context of adolescence. Since adolescence is a time of striving for autonomy and independence, adolescents typically engage in behaviors that may not be acceptable by the standards of school personnel and family. These risk behaviors include sexual activity and substance use, and academic disengagement. As stated earlier, adolescents are aware that they should not be engaging in these behaviors, yet they are still doing them. There are a variety of prevention programs (e.g., educational) and interventions that adolescents have been exposed to; yet, they have not yielded the desired outcomes of reducing risky behavior. The next step is to find an effective treatment that can meet the needs of adolescents within the context of these transitions and demands as well as the adolescents own desires. It is proposed that the therapeutic approach, Motivational Interviewing, can do just that.

**Motivational Interviewing**

Motivational Interviewing (MI) is a client-centered therapeutic approach that focuses on the individual’s self-identified motivations to change the behaviors he or she is ambivalent about (Miller & Rollnick, 1991; 2002; 2012). MI is theoretically driven by the social learning theory and is reflective of cognitive behavioral therapy. However, Macgowan and Engle (2010) state that the techniques come from the humanistic perspective such that it reflects the work of Carol Rogers’ (1951) client based approach. Macgowan and Engle (2010) reviewed studies that used MI and evaluated them according to the American Psychological Association’s Division 12 Task Force criteria. According to Macgowan and Engle (2010), MI is recognized as a promising intervention within schools, communities, clinics and hospitals for adolescents who use substances.

When people are about to change their behavior, many times they are ambivalent. Change can be difficult, and despite the knowledge about the importance of the change, people
can feel uncertain and have conflicting cognitions about the change. Individuals may be in
different stages of change and have a different level, if any, of ambivalence. MI approaches this
ambivalence as an opportunity to elicit client self-resolution (Rosengren, 2009). Miller (1983)
claimed that MI was created to help people work through their ambivalence and commit to
change. Success in self-resolved problems will increase self-efficacy of that behavior. Behavior
change is often nonlinear and even after a few successes of that behavior change, a person can
return to the initial behavior (Prochaska & DiClemente, 1984; Rosengren, 2009). Within the
context of MI and its goals, engaging in new behavior allows for opportunities to increase self-
efficacy through these success and failures. Another basic concept is that readiness to change is
not static and throughout the therapy, a person’s ambivalence may interfere with his or her
readiness to change (Prochaska & DiClemente, 1984; Rosengren, 2009).

Therapeutic techniques in MI are based primarily in the communication between the
therapist and the client. Miller, Rollnick, and Butler (2008) identify the three forms of
communication the therapist can use as: following, directing, and guiding. Following is when
the therapist actively listens without providing constructive feedback and judgment. Directing is
when the therapist is seen as the expert and is more of an authoritative approach as the therapist
tells the person what to do. Guiding is essentially the middle point between following and
directing. When the therapist communicates in a guiding fashion, the therapist is seen more as
the knowledgeable “travel agent” who helps the person maneuver around his or her thoughts,
behaviors, and decisions (Miller, Rollnick, & Butler, 2008). Most of the communication in a MI
therapeutic relationship is the guiding style except for the initial communication, where it is
encouraged to use the following technique in order to build rapport. The guiding style allows the
client to take ownership in his or her thoughts and behavior choices which then can increase self-efficacy.

There are five major components to MI: spirit of MI, MI principles, OARS, change talk, and MI processes (Table 2.1; Miller & Rollnick, 2002, 2012; Rosengren, 2009). The spirit of MI is the most crucial component to MI, and is the guiding philosophy of MI. The spirit of MI is defined as the way of being in the therapeutic relationship and consists of four parts: collaboration, acceptance, evocation, and compassion (Miller & Rollnick, 2012). Collaboration is about creating a therapeutic relationship that is more like a partnership. It is meant to provide an environment which is conducive to change without being authoritative (Miller & Rollnick, 2002, 2012; Rollnick, Miller, & Butler, 2008). Acceptance is created by the therapist making sure the client has absolute worth and autonomy, and provides the client with affirmation and accurate empathy. The client is seen as the one in the relationship that holds the true authority to change. Hettema and colleagues (2005) claim that MI emphasizes clients’ autonomy of when and how to change their behaviors. This is appropriate for adolescents since the period of adolescence is a time of striving for autonomy.

The last two parts are evocation and compassion. Evocation is about refraining from being the expert by providing information to the client and instead, eliciting the intrinsic motivation for the change from the client (Miller & Rollnick, 2002, 2012; Rollnick, et al., 2008). Behavior change is within and comes from the client; so, it is crucial to support the autonomy of the client. The therapist must refrain from pressing for change in the client. Compassion is not actually sharing an emotional experience but to “actively promote the other’s welfare, to give priority to the other’s needs” (Miller & Rollnick, 2012, p. 20). The MI spirit is
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<th>Component</th>
<th>Definition</th>
<th>Components</th>
<th>Definition/purpose of components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spirit of MI</td>
<td>The way of being in a therapeutic relationship (person-centered approach)</td>
<td>Collaboration</td>
<td>Therapeutic partnership without hierarchy of the therapist over the client</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Evocation</td>
<td>Therapist refraining from being the expert and allowing the client to be the expert of themselves</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Acceptance</td>
<td>Therapist accepts the client for whom and where they are currently. Includes: absolute worth, accurate empathy, autonomy, and affirmation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Compassion</td>
<td>Therapist actively promotes the client’s welfare, to give priority to their needs</td>
</tr>
<tr>
<td>MI Principles</td>
<td>Guiding tools for the therapist</td>
<td>Resist the righting reflex</td>
<td>Refraining from actively fixing the client’s problems</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Understand client’s motivations</td>
<td>View the world through the client’s perspective</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Listen to client</td>
<td>Conscious efforts to listen increases the client’s comfort and safety</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Empower client</td>
<td>Encourage and support the client</td>
</tr>
<tr>
<td>OARS</td>
<td>Microskills used in MI</td>
<td>Open-ended questions</td>
<td>Elicits client to explain and elaborate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Affirmations</td>
<td>Provokes feelings of being heard and understood</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reflective listening</td>
<td>Provides the therapist to show they are being heard and understood</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Summaries</td>
<td>Demonstrates reflective listening and allows clients to make corrections</td>
</tr>
<tr>
<td>Component</td>
<td>Definition</td>
<td>Components</td>
<td>Definition/purpose of components</td>
</tr>
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<td>---------------------------------------------------------------------------</td>
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<td>--------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Change Talk</td>
<td>Wording in a statement that reflects a client’s feelings towards change</td>
<td>Desire</td>
<td>Statements about wanting to change</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ability</td>
<td>Statements about capability</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reasons</td>
<td>Statements that include arguments for change</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Need</td>
<td>Statements about feeling oblige to change</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Activation</td>
<td>Statements about being willing, ready, or prepared to change</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Commitment</td>
<td>Statements about the probability to change</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Taking steps</td>
<td>Statements about action already being taken or about to be taken</td>
</tr>
<tr>
<td>MI Processes</td>
<td>The central processes that form the flow of MI</td>
<td>Engaging</td>
<td>There is a working relationship and it consists of a helpful connection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Focusing</td>
<td>The focus becomes about what the person came to discuss</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Evoking</td>
<td>There is an elicitation of the client’s own motivations to change</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Planning</td>
<td>The client begins to commit to and create a plan to change</td>
</tr>
</tbody>
</table>
the most important part to MI, and without it the therapy cannot be considered MI (Miller & Rollnick, 2002).

The four principles of MI can be remembered using the acronym RULE: Resist the righting reflex, Understand your client’s motivation, Listen to your client, and Empower your client (Rollnick et al., 2008). Resist the righting reflex is about refraining from engaging in actively fixing the client’s problems as it can hinder behavior change and cause resistance from the client. MI seeks to facilitate change by supporting self-efficacy in the client, and helps to build the individual’s belief in his or her own ability to make change when he or she eliminates the righting reflex. Rosengren (2009) identifies four therapists’ behaviors that can increase resistance and impede the behavior change. They are “(1) trying to convince clients that they have a problem, (2) arguing for the benefits of change, (3) telling clients how to change, and (4) warning them of the consequences of not changing” (Rosengren, 2009, p. 10). Again, the MI spirit focuses on the collaborative relationship between the therapist and client, so eliminating these behaviors strengthens the collaborative relationship.

The second principle is to understand is the client’s motivation. When working with people, it is important to view the world as they do. A therapist should be knowledgeable about what motivates their clients to be able to successfully guide them into behavior change (Rosengren, 2009). With adolescents, this is especially important as their perspective is often entirely different from that of adults. Therapists are encouraged to seek information about what drives the client’s behavior such as their goals, beliefs, and aspirations. Rosengren (2009) states that it is important to understand the patient as much as possible, because it assists in finding errors in the thought process and identifying incongruence between his or her desires and behaviors. Listening to the client is about creating a therapeutic environment that allows the
client comfortably and safely discuss all problems. Therapists must use reflective listening and remain nonjudgmental when working with their clients (Rosengren, 2009). By actively listening to the clients within the context of a strong therapeutic relationship, it can assist with behavior change. Lastly, empowering the client means to be encouraging and supportive with the client. The therapist needs to show that he or she believes that the client is capable of behavior change. Therapists, who provide this, create the foundation for the client’s self-efficacy.

OARS is an acronym for the microskills that are used in MI. OARS stands for open-ended questions, affirmations, reflective listening, and summaries (Miller & Rollnick, 2002, 2012; Rosengren, 2009). Open-ended questions, by the therapist, allow for the client to explain or elaborate a response and add more detail rather than from short, single-answered responses that are elicited from closed-ended questions. Affirmations allow for the client to feel heard and understood. Affirmations do not mean agreement, but are more about showing the client that he or she is appreciated and have strengths (Rosengren, 2009). They are simple statements that demonstrate the therapist’s reflective listening. Reflective listening is very important in MI (Rosengren, 2009). It allows for the client to feel comfortable and safe as he or she perceives the therapist as interested, empathetic, and understanding. Summaries demonstrate reflective listening and point out the main details that will elicit behavior change. The summaries should be provided regarding the clients’ already stated change talk (Rosengren, 2009).

The therapeutic techniques used in MI are designed to elicit change talk in the client. Hettema et al. (2005) state that MI utilizes the client’s change talk in order to explore the client’s own arguments and motivations for change. Change talk is the wording in a statement that reflects a client’s desire, ability, reason, need, activation, commitment, or taking steps to change (Miller & Rollnick, 2002, 2012; Rollnick et al., 2008). Miller and Rollnick (2008, 2012) define
each type of change talk as follows: (1) desire – statements about wanting change, (2) ability – statements about capability, (3) reasons – statements that include arguments for change, (4) need – statements about feeling obligated to change, (5) activation – statements about movement toward action but absent of commitment (6) commitment – statements about the probability of change, and (7) taking steps – statements about action already being taken or about to be taken. Therapists need to be aware of change talk as it provides an opportunity for guided communication. Miller and Rollnick (2002) that MI utilizes this change talk to increase motivation and pair it with commitment of some behavior change.

There are many aspects to MI, but Miller and Rollnick (2002) identify the four overall general principals of MI. They are: express empathy, develop discrepancy, roll with resistance, and support self-efficacy. Empathy is about providing a client-focused therapy that is free of judgment and is focused on accepting the client for who they are. Developing discrepancy is about guiding the client to see how their current behavior impedes their personal goals and values. It is about allowing the client to identify this discrepancy and create arguments to change. Sometimes a client may avoid arguing for change subtly or overtly. It is important for the therapist to be aware of when this happens as many times it is a result of the therapist behaviors and response. The therapist needs to interpret this as a signal to respond differently to the client. This principal is called rolling with resistance. Supporting self-efficacy is about the therapist allowing for the client to take ownership in choosing a plan and initiating in the plan to obtain their behavior change. It is about using the client’s belief in changing as their motivator.

Miller and Rollnick (2012) identify the four processes in MI that help guide the sessions and are highly related to the general principles. The four processes are engaging, focusing, evoking, and planning. Engaging is about the initial rapport building. It is the part of the session
in which the client and therapist create a reciprocal working relationship. The “therapeutic engagement is a perquisite for everything that follows” (Miller & Rollnick, 2012, pp. 27). Once engagement is established, the next process is focusing. Focusing is the establishment and maintenance of the direction of the conversation. The conversation is established around the identified change needed or behavior goal. Evoking is a process is that is one of the underlying components of MI. It is the process of identifying the client’s own motivations in order to elicit the behavior change. The process of evoking supports the client’s autonomy and ownership of change. The last process is planning. Planning is when the therapist focuses on the client’s change talk. It is when the person is beginning to move from a stage of change to the next. This process requires the client to make the commitment to change and create a plan of action. Sometimes these process overlap; however, the session begins with engagement and ends with planning (Miller & Rollnick, 2012). Planning is also a process that is often revisited in longer therapeutic relationships as “unanticipated challenges and new obstacles arise that may cause a person to rethink plans a commitment,” (Miller & Rollnick, 2012, p. 30).

Miller and Rollnick (2002) deem MI as an appropriate therapeutic approach with adolescents because of the myriad of transitions they experience. As mentioned earlier, adolescence is a time of self-identification and developing autonomy and with this comes ambivalence. MI is structured for the client to take ownership in his or her choices, is free of judgment, and is designed to take advantage of and eliminate the ambivalence. All these characteristics fit the needs and desires of adolescents. As adolescents are rapidly developing and all at a different pace, the use of the individualized approach of MI allows for a variety of applications (i.e., prevention and intervention) and is effective for many of adolescents (Miller & Rollnick, 2002).
Motivational Interviewing Evidence-Base

Motivational Interviewing has been shown to be effective with a variety of populations and problem behaviors. There have been a couple meta-analyses conducted over the years supporting and critiquing MI (Burke et al., 2003; Dunn et al., 2001). Hettema and colleagues (2005) conducted a meta-analysis of 72 clinical trials of MI and its varied applications (i.e., amount of sessions, populations, and problem behaviors). Of the 72 clinical trials analyzed, 41 studies used only MI or MI plus feedback and the other 31 used a combination of MI and other interventions (i.e., education, self-help manuals, relapse prevention, cognitive therapy, and stress management). The studies that included follow-ups ranged from 0 to 60 months post-treatment. Hettema and colleagues (2005) reported that duration of MI ranged from 15 minutes to 12 hours and dosage averaging 2.24 sessions ($SD = 2.15$). In relation to the effect sizes, Hettema et al. (2005) found extreme variability in size across studies and within problem areas. It was also reported that the effect size of MI tends to diminish after time even when large effect sizes are initially found. Table 2.2 displays the effect sizes of clinical trials MI across time.

<table>
<thead>
<tr>
<th>Follow-Up Time</th>
<th>Effect Size $d_c$</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 1 Month</td>
<td>0.77</td>
<td>0.35-1.19</td>
</tr>
<tr>
<td>&gt;1 to 3 Months</td>
<td>0.39</td>
<td>0.27-0.50</td>
</tr>
<tr>
<td>&gt;3 to 6 Months</td>
<td>0.31</td>
<td>0.23-0.38</td>
</tr>
<tr>
<td>&lt;6 to 12 Months</td>
<td>0.30</td>
<td>0.16-0.43</td>
</tr>
<tr>
<td>&gt;12 Months</td>
<td>0.11</td>
<td>0.06-0.17</td>
</tr>
</tbody>
</table>

Motivational Interviewing has shown to be effective with a variety of people. Research demonstrates effectiveness with people in adolescence (Chen et al., 2011; Naar-King et al., 2006), young adult (Dermen & Thomas, 2011), and adulthood (Hettema et al., 2005; Lundahl,
Kunz, Brownell, Tollefson, & Burke, 2010; Satre, Delucchi, Lichtmacher, Sterling, & Weisner, 2013). Results on the effectiveness of MI with ethnic minorities have been variable (Mason et al., 2011). In the aforementioned meta-analysis conducted by Hettema and colleagues (2005), the researchers found that effect sizes were large when applying MI with ethnic minorities; however, only six of the 72 articles had a majority of the participants as African Americans. Montgomery, Burlew, Kosinski, and Forcehimes (2011) conducted a secondary analysis of a version of MI, Motivational Enhancement Treatment (MET) and its efficacy with African Americans. They found that the MET produced higher retention rates for women, but more drug using days per week when compared to counseling as usual.

**Substance Use**

Research on the effectiveness of MI with substance abuse has been variable, but mostly promising. Kelly and Lapworth (2006) reported that the brief MI resulted in significant reduction in cigarette use at the one-month follow up; however, at the three- and six-month follow-up, these significant results diminished when compared to a control group. These researchers worked with 56 adolescents who were identified as cigarette smokers. The adolescents were randomly assigned to either the one, one hour standard care or the one, one hour motivational interviewing group (Kelly & Lapworth, 2006). Limitations in this study are sample size and fluctuation in power levels due to attrition.

Similarly, Audrain-McGovern and colleagues (2011) found promising results of MI when compared to a structured brief advice intervention for adolescent smoking behavior. Three hundred and fifty five adolescents who smoked at least one cigarette a month and 100 cigarettes in their lifetime were recruited and randomly assigned to receive either five sessions of MI or five sessions of structured brief advice. Compared to adolescents who received the structured
brief advice, adolescents who received MI showed a 40% greater reduction in daily smoking. Additionally, adolescents who received MI were 59% less likely to try to quit smoking than those in the other group. The results may have been confounded by the integrity of the MI (Audrain-McGovern et al., 2011). Of the sessions selected for treatment integrity, all the therapists were either at beginning proficiency or proficiency. These levels are good; however, it is suggested that when applying MI, the interventionists should be highly trained in MI, as accurate communication styles and techniques are crucial for its effectiveness.

Medical settings are a common place for MI interventions. Colby et al. (2005) evaluated the effects of brief MI when compared to standardized brief advice for adolescent who smoke. They found that in 85 adolescents who were randomly assigned to one of the two groups, those in the MI group had a significant increase in their motivation to quit immediately following the intervention. At the one- and three-month follow-up, there were no significant differences in the changes between groups on cigarette use. At the six-month follow-up, there was a significant difference in use for the MI group as compared to the control group.

In another study that compared brief MI to standard care in the emergency department (ED) for alcohol-positive adolescents, it was found that those who were in the brief MI condition reported a significant decrease in the average number of drinking days per month. Also, the frequency of high-volume drinking decreased for adolescents who reported having problematic alcohol use prior to the visit (Spirito et al., 2004). The 154 adolescents who were enrolled in the study were originally recruited by testing positive for blood alcohol concentration by lab test or a self-report and were randomly assigned to one of the two conditions. Each condition was conducted on the day the adolescent was brought to the ED once their Blood Alcohol Content was less than .01. The MI condition consisted of one 35-45 minute session and the standard care
condition was a five minute advice session. Results could have been more promising; however, a visit to the ED may in fact be a confounding variable and be an intervention itself for the low level drinkers and therefore mask the effects.

Many times, researchers integrate MI with other therapeutic approaches in order to decrease substance use. Mason and colleagues (2011) examined the efficacy of MI integrated with social networking with 28 (14 control, 14 intervention) African American adolescent females who were identified as a high risk group for substance use and sexual activity behavior. Females enrolled into the intervention received one 20 minute MI session that addressed risk areas and the effects of social networking. Results showed that adolescents enrolled in the intervention had significantly less trouble due to alcohol and had less substance use before sexual intercourse then at baseline.

In a longitudinal feasibility study integrating MI with a cognitive-behavioral based alcohol intervention it was found that when compared to a control group, adolescents who received the treatment decreased their frequency in drinking at post-treatment and one month follow-up (Bailey, Baker, Webster, & Lewin, 2004). The control group reported increases in their frequency of binge drinking and hazardous drinking at the two month follow-up. It is important to note that this was a feasibility study, and it had a small sample size (n=34) with 17 participants in each group.

Sexual Activity

MI has been used with adults and youth living with HIV. In a study in which Chen et al. (2011) used a MI-based multi-risk reduction intervention with 142 (71 control group, 71 intervention) adolescents with HIV, it was found that adolescents who participated in the MI-based intervention and who were identified as persistent low sexual risk group maintained their
status as compared to the control group. This means they used condoms more frequently during sexual intercourse than the control group. Those who were identified as high and growing risk and received the intervention showed declines in sexual risk taking by increasing condom use.

Researchers have also demonstrated an interest in using MI to address more than one problematic behavior. Naar-King and colleagues (2006) recruited 51 HIV-positive youth and randomly assigned them into a control group or a four-session motivational enhancement intervention which contained aspects of MI and cognitive behavioral therapy. Results showed that those in the intervention group had significantly lower reports of unprotected sex acts and viral loads than the control group. There were no significant differences for alcohol and marijuana use.

Dermen and Thomas (2011) conducted a study that focused on reducing college students’ drinking and sexual activity through a MI-based intervention. One hundred and fifty four college men and women were randomly assigned to four groups (i.e., control, alcohol risk intervention, HIV risk intervention, Alcohol plus HIV risk intervention). All three intervention groups were MI-based. They found that in the alcohol risk intervention, college drinking was less frequent in follow-up when compared to the control group but not for the combined and HIV conditions. The participants in the HIV risk condition drank significantly less than that in the combined intervention at follow-up. In the previous mentioned study by Dermen and Thomas (2011) that examined the effects of MI-based intervention on college students’ drinking and risky sex, those in the HIV risk intervention engaged in unprotected sex less than those in the control condition; however, there was no significant difference at follow-up between the HIV risk condition and the alcohol risk or Alcohol plus HIV risk condition.
The variability in the findings on the effectiveness of MI may be due to the application of it (e.g., telephone, individual, group, number of sessions), settings (e.g., school, health care settings), the type of drug (e.g., alcohol, cigarettes, marijuana), and the integration of it with other therapeutic approaches (e.g., cognitive-behavioral therapy, interpersonal therapy, skill trainings). However, with majority of the studies showing positive effects, the MI approach appears to be promising.

**Academics**

Currently, there are limited studies that evaluate MI’s effectiveness on increasing academic engagement. Strait and associates (2012) conducted a brief single session of MI with middle school students to improve academic performance and self-efficacy. Strait and colleagues found that homework completion and academic self-efficacy increased compared to a waitlist control group. Results showed that the students in the MI group were significantly more likely than the control group to report an increase in participation and positive academic behavior; specifically, in math. However, MI did not increase homework completing or academic self-efficacy. In a replication study by Terry and colleagues (2013), the results were similar to the first study such that there was a positive effect on math grades.

One study showed that participants in a MI intervention combined with solution-focused counseling and motivational stimulation had a significant decrease (61%) in truancy rates compared to those in the control group (Enea & Dafinoiu, 2009). Considering MI is a therapeutic approach used for behavior change, it can be assumed that it can both increase positive behavior and decrease problematic behaviors. Thus, it logically follows, if applied correctly MI can increase academic engagement. Because academic engagement is based on
behavior instead of on intellectual ability and emphasizes self-efficacy, with practice and self-identified motivators, adolescents can increase academic engagement.

**Feasibility and Acceptability**

Research assessing the acceptability and feasibility of MI with adolescents is sparse. Specifically, there is only one known study that specifically exams the acceptability and feasibility of MI with adolescents and none in schools. However, it appeared that MI had promising results pertaining to both acceptability and feasibility. Yeagley and colleagues (2012) assessed the feasibility and acceptability of a brief one session motivational interviewing intervention with adolescents living with HIV. They found that due to the one session and clinic setting, the intervention was easy to implement. Also, MI does not require many materials other than a few guiding worksheets and only one clinician. However, most non-manualized treatments can claim the same. Acceptability results were mostly positive. Of the 16 participants, 11 said they like the MI session better than standard care and 13 would recommend it to others. However, two participants stated they absolutely did not like the MI session.

**Conclusion**

Bandura (1986; 1997; 2002) describes the crucial interrelated roles of personal factors, behavior, and environmental events in human behavior in his Social Cognitive Theory. The SCT focuses on the reciprocal relationship of all factors in the Triadic Reciprocal Causation Model. One of the most important factors is personal, in the form of self-efficacy. Self-efficacy is the belief in one’s ability to successfully execute a desired behavior in order to gain the desired consequence (Bandura, 1997). Self-efficacy is a concept that is utilized in all levels of development from infant to adulthood; however, self-efficacy is particularly important during the
time of adolescence. By increasing self-efficacy in prosocial behavior, risky behavior can decrease.

Adolescence is a time in which both individual and contextual changes are rapid and pervasive. Some of the changes included are physical, psychological, cognitive, neurological, and social (Bandura, 2006a; Jesser, 1991; Miller & Rollnick, 2002). Along with these changes, adolescents begin to challenge authority and adults as they are striving for autonomy. Many times, this results in the adolescent pushing against authority and adults, and can lead to at-risk behaviors, especially in the context of all the developmental changes. These behaviors include sex, substance use, and problematic school behaviors (i.e., truancy, lack of participation, incomplete coursework).

MI has been shown to be effective for decreasing engagement in risky behavior. There is a substantial literature base regarding adolescent substance use (Colby et al., 2005; Kelly & Lapworth, 2006; Spirito et al., 2004) and addictions (Dermen & Thomas, 2011), and MI has been shown to decrease sexual activity (Chen et al., 2011; Dermen & Thomas, 2011; Naar-King et al., 2006). Taken together, it is reasonable to hypothesize that MI may be useful to decrease risky behaviors such as sexual activity and substance use, and effective in increasing adolescent academic engagement through the mechanism of increased self-efficacy and outcome expectations.
Chapter III: Methods

The purpose of this study was to assess the feasibility, acceptability, and the effectiveness of a Motivational Interviewing (MI) intervention on female adolescent substance use, sexual activity and adolescent academic engagement in an alternative school setting. What follows is a description of the recruitment procedures, descriptions of the intervention, the measures used and the procedures for data collection.

Research Design

This study used a quasi-experiment randomized pretest, posttest, posttest2 control group design. The recruitment of the participants was considered to be a rolling recruitment as enrollment was based on the time of referral. Once the consent and assent were obtained, the students completed data collection one. Following data collection one, or the pre-test, the participants were randomly assigned to either the treatment or control group. Due to the school’s scheduled spring break, students in the experimental group were not seeing until two weeks after enrollment and data collection one. After eight weeks of treatment for the experimental group or nine weeks after data collection one for the control group, data collection two, or post-test one, was completed. A month following the second data collection, the participants completed data collection three, or post-test two. The steps in the experiment are diagramed in Figure 3.1.

Participants

Recruitment of Participants

Participants were recruited from a mid-Atlantic United States alternative high school after the researcher obtained approval for the study from Duquesne University’s Institutional Review Board (IRB) and the participating school. All students in this alternative education school have been adjudicated for a variety of offenses (e.g., delinquency such as drug use or
<table>
<thead>
<tr>
<th>1st measurement of the dependent variables ($O_1$) = Pre-test/baseline delivered within a two weeks prior to first session of the experimental group</th>
<th>Exposure to the Treatment ($X$) (independent variable) Treatment for eight weeks for experimental group</th>
<th>2nd measurement of the dependent variables ($O_2$) = Posttest 1 delivered within one week past eighth session for experimental group or nine weeks from pre-test for the control group</th>
<th>3rd measurement of the dependent variables ($O_3$) = Posttest 2 delivered one month after Posttest 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adolescents complete the demographics and all tools. Data is gathered from teachers.</td>
<td>Intervention = Motivational Interviewing Control = Care as Usual</td>
<td>Adolescents complete the self-efficacy and outcome beliefs scales for sex substance use, and academic engagement tool. Data is gathered from teachers.</td>
<td>Adolescents complete the self-efficacy and outcome beliefs scales for sex substance use, and academic engagement tool. Data is gathered from teachers.</td>
</tr>
</tbody>
</table>

*Figure 3.1* Research design with detail description for each stage.

assault; dependency such as homelessness or parent abandonment) and they are placed here due to extreme, acute at-risk behaviors. Student’s eligible for the study were females, between the ages of 14 and 16, who are either a freshman or sophomore and whose parents, families, and school personnel were concerned about substance use, sexual activity and poor academic engagement.

Prior to recruitment for the study, the high school administration and faculty were provided with a verbal description of the intervention and who would be eligible for the study (e.g., adolescent females ages 14 to 16) by the school psychologist of the school. Consistent with school practices, school personnel who believed a student was suitable for the study referred that student to the school psychologist as part of the Student Assistance Program (SAP) team process. After the school referral process, the school psychologist provided the researcher with the list of eligible females.
After the referral to the research study, the participating school sent a standard letter and two consent forms to the parents or guardians of the eligible females informing them of the study and the opportunity for participation. Concurrently, the primary investigator called each individual parent or guardian to discuss the study and their potential participation. Families were notified that some students would receive the MI intervention and that some would not. For families that were interested in participation, they were asked to sign both copies of the consent form and to return one to the school. After receiving the signed consent form back, the eligible female students were then approached (e.g., the purpose of the study reviewed, the MI intervention was explained, that some students may not receive the intervention and their interest in participation was requested). The females who were interested signed the assent form. Only youth with child and parent permissions were enrolled in the study.

Following their signed assent, students completed the demographic form and questionnaire packet. The research assistant then randomly assigned each participant to one of two groups (e.g., MI intervention or control). Although the females were not randomly selected - given the need to adhere to the referral processes already used within the school – the potential participants were randomly assigned to each group as they were enrolled using the sequentially numbered, opaque sealed envelopes (SNOSE) process (Doig & Simpson, 2005).

Females who were enrolled in the MI intervention condition were instructed that they would meet with the interventionist for eight weeks. At week nine, (i.e., the week following the completed intervention) the intervention group completed data collection two. For the control group, they completed data collection one when assent was signed and data collection two at week nine. Both groups completed data collection three after data collection two.
A total of 33 students were eligible for the study, but only 24 eligible females were able to be contacted for the study. Six students were not enrolled because either the parents or students were uninterested (i.e., two parents did not give permission and four students were uninterested even though the parents agreed). Two additional students were not enrolled in the study because consent was not obtained in a timely manner. The total sample size was 16 participants (eight control, eight intervention). Two students withdrew from the study leading to an initial attrition rate of 12.5%. Both students were enrolled in the intervention group; one withdrew in the first session stating that she just completed a similar counseling intervention a few weeks earlier; the other withdrew before session four and stated that she was overwhelmed with services because she was enrolled in five different counseling programs and was missing too much academic instruction throughout the school day. The final sample size was 14 participants (eight control, six intervention).

Prior to the study, a power analysis was conducted for a repeated measures analysis of variance within-between groups and using the average effect size for one month to three month follow-up found by Hettema et al. (2005), the analysis indicated that to obtain power of .9 the study would need 16 participants as determined by G*Power. Due an enrollment of exactly 16 and then an attrition rate of 12.5%, the final total enrollment did not meet the required sample size of 16 participants.

**Participant Characteristics**

Fourteen adolescent females who were at-risk for, or engaged in, sexual activities, substance use and were academically disengaged, were enrolled in the study. Of them, 64.3% were African American, 21.4% were biracial and 14.3% were White. Half of the females were 15 years old and the other half were 16 years old. Despite the females being either 15 or 16
years of age, per there report the grade range was from 8\textsuperscript{th} to 11\textsuperscript{th} grade with the mode being 9\textsuperscript{th} grade. However, the school verified that all students were in either 9\textsuperscript{th} or 10\textsuperscript{th} grade. The variation in their grade placement is due to the fact that six of the females repeated at least one grade during their educational history with 83.3% being retained in middle school. One participant was pregnant at the time of recruitment and one participant had an infant.

Variables

Independent Variables

The independent variable is the intervention, Motivational Interviewing, which is an eight week, 35-minute individual session addressing the areas of substance use, sexual activity, and academic engagement.

Dependent Variables

There were six primary dependent variables. For each construct (i.e., substance use, sexual activity, and academic engagement) both self-efficacy and outcome expectancy were measured. Substance use self-efficacy is the confidence in one’s ability to make decisions regarding engagement in substance use. Substance use outcome expectancy is the belief that if one engages in a behavior, she will obtain the outcome she desires. Sexual activity self-efficacy is the confidence in the ability to make decisions to engage in sexual activities. Sexual activity outcome expectancy is the belief in obtaining the desired outcome if one engages in a specific behavior. Finally, academic engagement self-efficacy is the confidence in the ability to engage in academic behaviors. Academic engagement outcome expectancy is the belief that if one engages in specific academic behaviors, she will obtain the outcome she wants.

There were three secondary dependent variables or variables that the intervention is not directly trying to change but could indirectly change along the process. The secondary
dependent variables are the actual substance use, sexual, and academic behaviors. Substance use is defined as the frequency of cigarette, marijuana, alcohol and other illicit drug use in the past thirty days. Sexual activity is defined as the amount of partners and frequency of sex, sex without a condom, and sex without pregnancy prevention. Academic engagement is defined as the frequency of class attendance and school work completion. Other baseline variables were family and school connectedness. Family connectedness is defined as the level of connectedness an adolescent feels with her family. School connectedness is defined as the level of the adolescent’s connectedness with school.

**Measures**

**Demographics**

Demographic information was obtained from each participant using an investigator-developed subject profile. Questions such as the subject’s birthday, age, race, grade, grade retention, with whom she resides, the identity of her guardian, and the number of siblings she has was asked. The demographics consist of basic descriptive information about the sample.

**Substance Use**

**Descriptive items.** A modified version of the 2013 National Youth Risk Behavior Survey (YRBS) was used as a descriptive measure of adolescent substance use behavior (CDC, 2013a). This tool has been used since 1991 and measures six health-risk behavior categories. The categories are behaviors that contribute to unintentional injuries and violence, sexual behaviors, alcohol and other drug use, tobacco use, dietary behaviors, and physical activity (CDC, 2011). A total of 20 substance use related items were extracted from the YRBS. The adolescents were asked if they have ever tried a drug (i.e., cigarettes, alcohol, marijuana, cocaine, huffed, heroin, meth, ecstasy, hallucinogens, and prescription drugs) and the age at
which they tried a drug (i.e., cigarettes, alcohol, and marijuana). They were asked in the past 30 days how many times have they used the following: cigarettes, alcohol, and marijuana. The frequency of alcohol and cigarette was also asked. Adolescents were asked if they were offered illegal drugs on school property in the past 12 months.

**Self-efficacy.** Substance use self-efficacy was measured using the Drug Use Resistance Self-Efficacy Scale (DURSE; Carpenter & Howard, 2009). The DURSE is a 24-item scale that measures adolescents’ beliefs about their ability to resist drugs. Each item uses a four-point Likert scale ranging from *Not Sure At All* (1) to *Definitely Sure* (4). The sum of all the scores of each item is the final score of the scale. Higher DURSE scores indicate greater resistance self-efficacy. Resistance questions on the scale are about alcohol, cigarette, and marijuana use. Question examples are as follows: “*How sure are you that you can refuse if a friend offers you alcohol at a party and you do not want it?*,” “*How sure are you that you can refuse if a friend offers you alcohol outside of your home (at a park, field, stress) and you do not want it?*,” and “*How sure are you that you can refuse if a friend offers you alcohol at school when do adults are around and you do not want it?*” Carpenter and Howard (2009) designed the questions so that the adolescents’ desires or wants would be eliminated by placing the emphasis on “when you do not want it.”

Reliability and validity of the DURSE is sparse. To date, no other studies have used the DURSE. Therefore, the current study will report Cronbach’s alpha coefficients for all subscales. Carpenter and Howard (2009) conducted a study with 223 seventh graders using the DURSE. Once the data was collected, they conducted an exploratory factor analysis (EFA) using principal component analysis. The EFA indicated high loadings for three factors, Marijuana, Cigarette, and Alcohol. All individual items had higher loading on at least one factor. However, items
highly loaded on each factor. After running correlations between factors, Carpenter and Howard (2009) claimed the tool was better interpreted as one single construct, Drug Resistance, rather than individual subscales. Internal consistency reliability of the scale for females and males were strong, $\alpha = .98$ and $\alpha = .97$, respectively.

Construct validity was measured by correlating the DURSE with the drug refusal skills scale (Hansen, & McNeal, 1997), refusal skills scale (Macaulay, Griffin, & Botvin, 2002), and intention scale. The DURSE showed moderate correlations with the drug refusal skills, $r = .47$, $p < .01$. The associations between the DURSE and refusal skills were also significantly moderately correlated, $r = .40$, $p < .01$. Intention to use drugs was negatively significantly correlated to the DURSE, $r = -.24$, $p < .01$ which is to be expected. Despite the lack of external validity and other use of the DURSE tool, the Carpenter and Howard (2009) study shows promising results; and therefore, was used in the current study.

**Outcome expectancy.** One of the key components to behavior change is an individual’s belief that once she engages in behavior that she will obtain the desired outcome (Bandura, 1986). The Cognitive Appraisal of Risky Events Revised (CARE-R) was used to measure negative and positive outcome expectations regarding substance use. The CARE-R is a revised version of the Cognitive Appraisal of Risky Events (CARE) which measures Risk, Benefit, Expected Involvement, and Past Frequency for Risky Sexual Behavior, Heavy Drinking, Illicit Drug Use, Aggressive and Illegal Behaviors, Irresponsible Academic/Work Behaviors, and High Risk Sports (Fromme, Katz, & Rivet, 1997). The Risk and Benefit scales measure the extent of adolescents’ anticipated negative and positive consequences of each risky behavior using a seven-point Likert scale ranging from *Not at All Likely* to *Extremely Likely*. The Expected Involvement uses the same seven-point Likert scale and measures the likelihood that an
adolescent will engage in the behaviors within the next six months. Similarly, the Past Frequency scales ask for previous involvement of the risky behaviors in the past six months. Fromme et al. (1997) state that either the Past Frequency and Expected Involvement scales should be administered in conjunction with the Risk and Benefit scales. This current study, however, only administered the Risk and Benefit scales.

Fromme et al. (1997) conducted a factor analysis and found factor loadings for each item for each factor for three of the scales (Expected Risk, Expected Benefit, and Expected Involvement). Factor loadings are only given for the Illicit Drug Use, Risky Sexual Behaviors, and Heavy Drinking, as the other scales are beyond the scope of this current study (Table 3.1). Fromme et al. (1997) conducted internal reliability analysis using Cronbach’s alphas. Their findings indicate adequate internal reliability (Table 3.2). Fromme et al. (1997) conducted test-retest reliability analysis with 98 undergraduate students, both male and female, and found Expected Risk reliability ranging from .51 to .65 and Expected Benefit reliability ranging from .58 to .79 for all scales. Alpha levels for all scales were also significant, \( p < .001 \), indicating consistency.

Table 3.1

<table>
<thead>
<tr>
<th></th>
<th>Expected Risk</th>
<th>Expected Benefit</th>
<th>Expected Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illicit Drug Use (three items)</td>
<td>.60 - .87</td>
<td>.62 - .84</td>
<td>.51 - .93</td>
</tr>
<tr>
<td>Risky Sexual Activities (six items)</td>
<td>.30 - .85</td>
<td>.28 - .86</td>
<td>.21 - .91</td>
</tr>
<tr>
<td>Heavy Drinking (three items)</td>
<td>.70 - .84</td>
<td>.71 - .96</td>
<td>.68 - .85</td>
</tr>
</tbody>
</table>

Fromme and colleagues (1997) also measured construct, criterion, and external validity for the CARE. Reliability coefficients were found for CARE with the Social Conformity
Questionnaire (SCQ; Newcomb, & Bentler, 1988) measure and Impulsive Unsocialized Sensation Seeking (IMPUSS; Zuckerman, Kuhlman, Joireman, Teta, & Kraft, 1993) measure. It was expected that for the CARE Expected Benefit and Expected Involvement of each risk behavior to be positively correlated with the IMPUSS and negatively correlated with the SCQ. The CARE Expected Risks scale was expected to be negatively correlated with the IMPUSS and positively correlated with the SCQ. Results supported this hypothesis indicating significant $p$ values for most correlations, thus signifying construct validity.

Table 3.2

<table>
<thead>
<tr>
<th></th>
<th>Expected Risk</th>
<th>Expected Benefit</th>
<th>Expected Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illicit Drug Use</td>
<td>.81</td>
<td>.82</td>
<td>.81</td>
</tr>
<tr>
<td>Risky Sexual Activities</td>
<td>.83</td>
<td>.82</td>
<td>.78</td>
</tr>
<tr>
<td>Heavy Drinking</td>
<td>.81</td>
<td>.84</td>
<td>.83</td>
</tr>
</tbody>
</table>

Regarding criterion validity, Fromme et al. (1997) compared actual engagement in risk behaviors ten days after the completion of the CARE tool. Fromme and colleagues (1997) conducted hierarchal regression analyses controlling for past risk-taking and found that Expected Benefit accounted for most of the variance in drug use and heavy drinking; and all three, Expected Involvement, Expected Benefit, and Expected Risk, together significantly accounted for the variance in the reported frequency of current risky sexual behavior. The external validity was demonstrated by comparing the results of a middle-class college sample to a diverse older group, which found significant involvement for Heavy Drinking, Risky Sexual Activities, and Illicit Drug Use for both groups (Fromme et al., 1997). This supports the external validity of the CARE. D’Amico and Fromme (2002) conducted a study comparing the effects of Drug Abuse Resistance Education program to that with a control group of adolescents. They measured the
outcomes using subscales from the CARE and found a significant correlation between the perception of risk-taking and actual risk-taking behavior for drinking behavior, but not drug use. This suggests that the external validity of CARE with adolescents is variable; however, the entire instrument was not given to adolescents. It is proposed that based on the general questions about substance use and sex, this tool can be used with adolescents.

At this time, current reliability and validity measures on the CARE-R was sparse. The CARE-R only measures Expected Risk, Benefit, and Involvement and Past Frequency for Risky Sexual Behavior, Heavy Drinking, and Illicit Drug Use, but in more detail than CARE (Katz, Fromme, & D’Amico, 2000). The scale includes a total of 111 items when giving only the Expected Risk, Benefits, and Involvement scales. Katz and colleagues (2000) conducted a study using the CARE-R to examine the effects of personality traits and outcome expectancies on actual heavy drinking, drug use, and risky sexual behavior among college. These researchers found that expected benefits were predictive of future substance use. Higher expected benefits and lower expected risks predicted heavy drinking, while only higher expected benefit was predictive of illicit drug use. Katz and colleagues (2000) did not demonstrate predictive value in the Risky Sexual Activities on future risky sexual activity.

The CARE-R has limited reliability and validity evidence; however, it is believed that based on the CARE measure and similar content questions that the scale is reliable. Because of the lack of established psychometrics properties of the CARE-R, this study will report Cronbach’s alpha coefficients. It is suggested by Katz et al. (2000) to use either Expected Involvement or Past Frequency and not both; unless, the tools are intended for research purposes. Therefore, only the Expected Risks and Expected Benefits scales of CARE-R were given.
Sexual Activity

**Descriptive items.** Again, a modified version of the 2013 National YRBS was used as a descriptive measure of adolescent sexual behavior (CDC, 2013a). A total of seven sexual activity related items were extracted from the YRBS. The adolescents were asked questions about if they ever had sex and at what age they first initiated it. The number of the participants’ lifetime partners was asked and how many partners they had in the past three months was also asked. In relation to their last sexual intercourse, the adolescents were asked if they were also drinking at the time of intercourse, if they used a condom, and what type of pregnancy prevention method they used, if any.

**Self-efficacy.** Sexual self-efficacy is a concept that is difficult to measure, as there are many types of sexual self-efficacy, such as refusal, assertiveness, and contraceptive use (Buzwell & Rosenthal, 1996; Cecil & Pinkerton, 1998; Rosenthal, Moore & Flynn, 1991) and sexual behavior is multidimensional (Cecil & Pinkerton, 1998). Cecil and Pinkerton (1998) created a 22-item instrument that measures the self-efficacy of protective sexual behaviors. This scale consists of three subscales, Refuse Sexual Intercourse, Question Potential Sex Partners, and Condom Use. The Refuse Sexual Intercourse subscale measures an adolescent’s self-efficacy to say “no” to sexual intercourse within different contexts. The Question Potential Sex Partners subscale measures an adolescent’s self-efficacy about being able to have conversations with their partners regarding sexual activity such as asking their partner about sexual relationships he or she have had in the past. The Condom Use subscale measures an adolescent’s self-efficacy to properly condom use and preventative measures.

Cecil and Pinkerton (1998) conducted a study assessing the reliability and validity of the sexual self-efficacy scale. In a study consisting of 221 undergraduates, Cecil and Pinkerton
(1998) found high Cronbach’s alpha coefficients for all subscales. The Refuse Sexual Intercourse Cronbach’s alpha coefficient was .85, the Question Potential Partners Cronbach’s alpha coefficient was .80, and the Condom Use Cronbach’s alpha coefficient was .81; all indicting internal consistency reliability. To analyze convergent validity in that same study, the researchers asked the undergraduates to also fill out a sexual behavior scale which measured their actual involvement in sexual activities (i.e., number of partners in lifetime and in past three months; and condom use in the most recent episode of sexual intercourse, past three months, and future use). All subscales were significantly correlated with each other ($p < .001$). Refuse Sexual Intercourse subscale was significantly correlated with number of partners in lifetime ($r = -.14, p < .05$), number of partners past three months ($r = -.22, p < .01$), and condom use in the most recent episode of sexual intercourse ($r = .18, p < .05$). It is assumed that if people have a high level of self-efficacy to say no to sexual intercourse, they would most likely have a lower number of partners and use condoms more often when they did engage in sexual intercourse. The subscale, Question Potential Partners, was significantly correlated with condom use in the most recent sexual intercourse ($r = .22, p < .01$) and condom use in the past three months ($r = .13, p < .01$). The third subscale, Condom Use, was significantly positively correlated with all three condom use measurements. As expected, if a person had high self-efficacy on the Condom Use subscale, his or her frequency of condom use would most likely be high.

In the previously mentioned study, convergent validity was measured by conducting two logistic regressions using self-efficacy levels to predict the chances of having an unintended pregnancy or sexually transmitted infection. Cecil and Pinkerton (1998) found that low levels of self-efficacy on the Refuse Sexual Intercourse were significantly predictive of unintended
pregnancies. However, they did not find evidence that the subscales can predict the possibility of contracting a sexually transmitted infection.

Lastly, Cecil and Pinkerton (1998) demonstrated discriminant validity by calculating Pearson correlation coefficients of the subscales against three unrelated instruments, the Computer Attitude Scale (Nickell, & Pinto, 1986), the Wilson-Patterson Attitude Inventory (Wilson & Patterson, 1968), and the Marlow-Crowne Social Desirability Scale (Crowne & Marlowe, 1960). All scales were found to be non-significantly correlated with the subscales of self-efficacy.

Other studies have demonstrated the reliability and external validity of the Cecil and Pinkerton’s self-efficacy tool. Kasen, Vaughan, and Walter (1992) surveyed 181 tenth graders about previous sexual activity and their current sexual self-efficacy levels using the Self-Efficacy of Protective Sexual Behaviors instrument. Results indicated that those with low self-efficacy on the Refuse Sexual Intercourse scale were more likely to have engaged in sexual activity in the past year. Adolescents with low self-efficacy levels on the Condom Use subscale were less likely to have used condoms in the past. Results indicate convergent reliability and external validity of the instrument. Salazar and colleagues (2011) used the subscale, Refuse Sexual Intercourse, with 715 African American female adolescents and found the scale to be reliable with this population (Cronbach’s $\alpha = .87$).

**Outcome expectancy.** Sexual activity outcome expectancy was measured using the CARE-R (Katz et al., 2000). This measure was extensively explained in the previous section (see Sexual Activity, Outcome expectations). This tool is shown to have good reliability and validity when measuring sexual activity outcome expectations. Of the 111-items, 69 of the items pertain specifically to sexual activity, including 15 items about sexual coercion. This scale
focuses specifically on the cognitions of expected involvement, benefits, and risks of sexual activity. Similarly to the substance use outcome expectancy, only the Expected Risks and Expected Benefits scales of CARE-R were given.

**Academic Engagement**

**Descriptive items.** Students’ attendance for each class was obtained from educational records for each class and day (i.e., excused and unexcused absences). All of the participants’ grades for classes at the time of data collection were obtained. The original proposal for the study included homework completion record; however, the students were not routinely assigned homework because of unsteadiness of their home life, thus there was no homework data available for comparison.

**Self-efficacy.** Two subscales from the Children’s Multidimensional Self-Efficacy Scales (CMSES; Bandura, 2006b) were used to measure academic engagement self-efficacy. The CMSES contains nine subscales with a total of 55 items. The subscales include self-efficacy ratings in the following areas: Enlisting Social Resources, Academic Achievement, Self-Regulated Learning, Leisure Time Skills and Extracurricular Activities, Self-Regulatory, Meet Other’s Expectations, Social, Self-Assertive, and Enlisting Parental and Community Support. The scales are measured using an 11-point Likert scale ranging from *Cannot do at all* (0) to *Highly creating can do* (100). When completed this self-report, the adolescents read a statement and then use the scale to respond to it based on their beliefs.

The CMSES subscales have been used in many studies and have established external validity. In an article published by Mills, Pajares, and Herron (2007), they used the subscale, Self-Efficacy for Self-Regulated Learning, with 303 college students enrolled in an introductory French course, and reported a high Cronbach’s alpha coefficient for the scale, $\alpha = .87$. Similarly,
Bandura, Barbaranelli, Caprara, and Pastorelli (1996) used the Self-Efficacy for Academic Achievement and Self-Efficacy for Regulated Learning subscales in their study examining the effects of parental and child’s self-efficacy beliefs on academic development of 279 children between the ages of 11-14. The reported the Cronbach’s alpha coefficients for each scale used in the study. The Cronbach’s alpha coefficients were high for both Self-Efficacy for Academic Achievement and Self-Efficacy for Regulated Learning (α = .87 and α = .80, respectively).

The two subscales that were used for this current study are Self-Efficacy for Academic Achievement and Self-Efficacy for Regulated Learning. The subscales have a total of 20 items. The Self-Efficacy for Academic Achievement measures the degree of confidence an adolescent has about learning specific academic subjects (e.g., general mathematics, biology, social studies). The Self-Efficacy for Self-Regulated Learning measures the confidence an adolescent has in his or her ability to engage in their academics. For example, a couple statements on this subscale are, “Finish my homework assignments by deadlines,” and “Plan my school work for the day.”

Zimmerman, Bandura, and Martinez-Pons (1992) conducted a study analyzing the predictive value of parental goal setting, student personal goals, and students’ self-efficacy on high school students’ final course grades. Zimmerman and colleagues (1992) measured self-efficacy using only two of the CMSES subscales, Self-Efficacy for Academic Achievement and Self-Efficacy for Regulated Learning. In their results they reported Cronbach’s alpha coefficients for each subscale. Internal consistency reliability for Self-Efficacy for Self-Regulated learning was strong, α = .87. For the Self-Efficacy for Academic Achievement, Cronbach’s alpha coefficient was also strong, α = .70. The high school students in this study created grade goals for the end of the semester and reported their final grades. Self-Efficacy for Academic Achievement was significantly correlated with Self-Efficacy for Self-Regulated

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Learners \( (r = .51, p < .05) \), student goals \( (r = .41, p < .05) \), and final grades \( (r = .39, p < .05) \).

Self-Regulated Learners was significantly correlated with student grade goals, \( r = .30, p < .05 \).

Based on Bandura’s Guide for Constructing Self-Efficacy Scales (2006b), the CMSES meets all criteria for a reliable and valid self-efficacy instrument. Based on the findings of Zimmerman et al. (1992), the subscales, Self-Efficacy for Academic Achievement and Self-Efficacy for Regulated Learning have predictive validity with academic goals and final grades of high school students. The scale has been used with a variety of ages demonstrating external validity and appears to measure the construct it was intended to measure. Therefore, the two subscales, Self-Efficacy for Academic Achievement and Self-Efficacy for Regulated Learning, were used in the current study.

**Outcome expectancy.** Currently, there are no published psychometrically sound instruments measuring academic outcome expectancy. Most researchers that measured academic outcome expectations created their own scales that typically were only used in their studies (Cunningham, Corprev, & Becker, 2009; DeFreitas, 2012; Smith, & Fouad, 1999). Academic engagement outcome expectancy was measured using the Secondary version of the Student Opinion Survey (SOS; McMillan, Simonetta, & Singh, 1994). McMillan and colleagues (1994) designed this 37-item instrument to measure high school students’ motivation through self-efficacy and attitudes toward learning. The tool consists of two scales and eight subscales. The scales are Total Attitude and Total Self-Efficacy. The subscales include General Attitude, General Self-Efficacy, Math Attitude, Math Self-Efficacy, Science Attitude, Science Self-Efficacy, Reading Attitude, and Reading Self-Efficacy. Each item is answered using a five-point Likert scale ranging from *Rarely* (1) to *Always* (5). The instrument originally contained
approximately 121 items, then after three administrations of three different drafts of the instrument to high school students, the final instrument contained 37-items.

Convergent reliability was assessed by comparing it to the Minnesota School Attitude Survey (MSAS; Ahlgreen, 1983) and the Maehr Scale (MS; Midgley et al., 2000). The MSAS measures two constructs: the importance of difference subjects and the enjoyability of different subjects. Because the MSAS also measures the enjoyability of different subjects, McMillan et al. (1994) utilized this scale to demonstrate discriminant validity. The MS measures student self-efficacy about academic behaviors in the school. Convergent and discriminate correlations were reported, however, they were the averages of the correlations between the MS and MSAS. Results showed moderate convergent correlations ranging from .30 to .64. Small discriminant correlations were also found with correlations ranging from .06 to .28. The higher end of the discriminant correlations and the lower end of the convergent are close; however, they do not overlap indicating some validity.

Due to small number of items, McMillan and colleagues (1994) were unable to conduct internal reliability tests. The researchers did, however, conduct test-retest reliability. Test-retest reliability ranges from .69 to 87 for the subscales and the Total Attitude had a Cronbach’s alpha of .84 and the Total Self-Efficacy Cronbach’s alpha was .88. The psychometric properties of the SOS are moderate and McMillan and colleagues (1994) suggest further reliability and validity testing. However, with strong test-retest reliability coefficients and moderate convergent and discriminate validity, this instrument deems appropriate for the current study.

**Family and School Connectedness**

Family and school connectedness was measured using the Hemingway Measure of Adolescent Connectedness 5.5 short form (Karcher, 2005). This tool is a 57-item measure that
has ten subscales. Each item uses a five point-Likert scale that ranges from Not at all (1) to Very True (5). The participant is asked to select the response that is most reflective of how true the statement is or how much they agree with the statement. The first subscale is Neighborhood and is comprised of six items. It measures the amount of time an adolescent spends in the neighborhood and the quality of the relationships with the neighbor adults and children. The Connectedness to Friends subscale measures how much time is spent with friends and the quality of those friendships. The subscale contains six items. Connectedness to Self-in-the-Present is a six item subscale that measures the adolescent’s sense of the continuity of behaviors within the context of others and places. It also addresses self-awareness skills. Karcher (2005) states that Self-in-the-Present is synonymous with identity. Connectedness to Parents subscale, which is six items, measures the adolescent’s involvement and relationships with their parents. The adolescent’s involvement and relationships with their siblings is measured using the five-item subscale Connectedness to Siblings.

The six-item subscale Connectedness to School measures the adolescent’s perspective and feelings towards school. It reflects the degree to which the adolescent attempts to be successful in school. Connectedness to Peers is a six-item subscale that measures the degree of the adolescent’s feelings of belonging, connectedness, and acceptance by peers. Connectedness to Teachers is a five-item subscale that measures the degree of adolescent concern about teacher relationships and quality of the relationships. The futuristic sense of self is measured by the five-item subscale, Connectedness to Self-in-Future. Connectedness to Reading is a six-item subscale that measures the adolescent’s ability to be alone and independently entertain oneself. The internal consistencies for all subscales are presented in Table 3.3.
Table 3.3

*Internal Consistency Coefficients (α) for Subscales of The Hemingway Measure of Adolescent Connectedness (Karcher, 2005)*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Overall</th>
<th>Female</th>
<th>African American</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neighborhood</td>
<td>.86</td>
<td>.86</td>
<td>.80</td>
</tr>
<tr>
<td>Friends</td>
<td>.78</td>
<td>.79</td>
<td>.73</td>
</tr>
<tr>
<td>Self-in-the-Present</td>
<td>.76</td>
<td>.77</td>
<td>.65</td>
</tr>
<tr>
<td>Parents</td>
<td>.81</td>
<td>.82</td>
<td>.75</td>
</tr>
<tr>
<td>Siblings</td>
<td>.90</td>
<td>.90</td>
<td>.82</td>
</tr>
<tr>
<td>School</td>
<td>.79</td>
<td>.80</td>
<td>.74</td>
</tr>
<tr>
<td>Peers</td>
<td>.70</td>
<td>.72</td>
<td>.65</td>
</tr>
<tr>
<td>Teachers</td>
<td>.84</td>
<td>.84</td>
<td>.77</td>
</tr>
<tr>
<td>Self-in-Future</td>
<td>.75</td>
<td>.74</td>
<td>.68</td>
</tr>
<tr>
<td>Reading</td>
<td>.90</td>
<td>.91</td>
<td>.79</td>
</tr>
</tbody>
</table>

The four main scales are comprised of the ten subscales and measure the total connectedness level. The Social Scale measures the adolescent’s connection with the neighborhood and friends. The internal consistency is high for this scale (α = .82). Karcher (2005) found internal consistency for females and African Americans to be high (α = .82, α = .77, respectively). The Familial Scale measures the relationships with parents and siblings. Internal consistency was high overall, for females, and for African Americans (α = .88, α = .88, α = .84, respectively; Karcher, 2005). The Academic Scale measures the relationship with school, peers, and teachers. Karcher (2005) found internal consistency to be high overall (α = .89), for females (α = .89), and for African Americans (α = .85). The Self Scale measures the view on self-in-present and self-in-future. Internal consistency was high for this scale, α = .83. For females and African Americans, internal consistency was also high on this scale (α = .83, α = .77, respectively).
Karcher and Sass (2010) examined the factorial validity of the Hemingway Measure of Adolescent Connectedness and the validity of the model with different races (i.e., Caucasian, African American, Latino) and gender (male vs. female). They used a confirmatory factor analysis to assess the factorial validity and found strong factorial validity [$\chi^2(1439) = 12,555.58, p < .001$, CFI = .964, RMSEA = .051, SRMR = .048]. To specifically assess gender and race, Karcher and Sass (2010) first conducted a first-order factor model invariance, followed by a test configural invariance for both gender and race. After establishing a model fit, the researchers tested for unstandardized factor loading and intercept invariance, and then measured the equality of the entire item’s residuals and the factor’s variance-covariance matrix. Results indicated that the Hemingway Measure of Adolescent Connectedness is a reliable tool for both genders and for all races studied.

**Motivational Interviewing Intervention Integrity**

In order to claim that the Motivational Interviewing intervention had effect on the adolescents self-efficacy and outcome expectancy, an intervention integrity check was conducted (Gresham, 1989). Intervention integrity verifies that the intervention was carried out in full compliance as designed. After completion of the intervention, an intervention integrity check was conducted by a research assistant who did not deliver the intervention. The research assistant reviewed the interventionist’s note forms (Appendix A) and used a checklist to ensure all components were completed (Appendix B).

**Internal and External Validity Considered**

**Internal validity.** Internal validity is the causal truthfulness of experimental research (McMillan & Schumacher, 2010). In other words, internal validity is the extent in which a causal conclusion can be made between the intervention and the dependent variables. McMillan
and Schumacher (2010) identify 12 threats to internal validity. The 12 threats are history, selection, statistical regression, pretesting, instrumentation, attrition, maturation, diffusion of intervention, experimenter effects, intervention replications, and subject effect. This study was designed with a treatment and control group within the same setting (i.e., school, individual counseling) and was vulnerable to the comparable groups, history and selection threats. Pretesting can affect the internal validity as the questions about substance use, sexual activity, and academic engagement can provoke thought and change in the adolescents. However, because both the control and treatment group completed the same pretests, this threat was restrained; any differences can be assumed to be due to the intervention.

The threat of instrumentation was minimal in this study. The same instruments were used across the three time periods and were based on the adolescents’ responses on self-report. The current study enrolled students who were required to be in attendance on all school days and it was conducted over a two month period. As mentioned earlier, the proposed number of participants to be recruited included the possibility of 20% attrition, while still maintaining statistical power of .9. McMillan and Schumacher (2010) define diffusion of intervention as the effect of the control group being exposed to with the intervention. The adolescents in both groups may have daily contact and sharing of information about the treatments may occur. However, due to the individualized approach of the intervention, it was difficult to claim it directly affected the control group participant. Intervention replication is a threat when the number of participants in a study is not the same as the number of intervention replications. Intervention replication was not a threat in this study as each adolescent is receiving the intervention separately and independently of the other adolescents.
There were a few threats to internal validity that may have affected this study. One was statistical regression, which is when the “scores of extreme groups move closer to the mean,” (McMillan & Schumacher, 2010, p. 111). Since the adolescents were referred to the program based on behaviors that were eliciting concern for the teachers, chances are their scores on the dependent variables were skewed, indicating there are the adolescent’s levels of self-efficacy and outcome expectations were already low. Typically, on the posttests, the adolescents’ will score higher or closer to the mean even if their self-efficacy and outcome beliefs remain the same. This means that it is expected that, the adolescents’ posttest scores will be higher. However, based on the reliability of the measurements, the regression to the mean was minimized.

Maturation may have affected the internal validity of this study. Due to the number of instruments utilized, the adolescent’s accuracy in responses to some of the items may have declined as they were completing the data collections. Another threat is the adolescents’ natural change in attitude towards substance use, sex, and academic engagement. The short time frame of this study may have limited maturation effects.

A major threat to internal validity was experimenter effects. One of the important factors to eliminating experimenter effects is for the interventionist to remain objective. The problem that exists in this study was that the Primary Investigator was the interventionist. Since the goal of the study was to increase self-efficacy and outcome expectations through MI and further fill the gap in the literature, the interventionist/Primary Investigator may have created bias or subjectivity. To avoid this, however, a reliability checklist was used by the interventionist to follow the intervention design and as previously mentioned, were intervention integrity checks done by the research assistant.
Another major threat to internal validity in this study was subject effects. Naturally, participants change their behaviors once enrolling in a study. The participants are aware that her behaviors are being monitored and therefore, subconsciously or consciously change her behavior (McMillan & Schumacher, 2010). When participants are aware of the behaviors in question she might respond in a way that she thinks the researcher wants them to respond. Due to the sensitivity of the questions being asked about substance use and sexual activity, and the societal and parental consequences that come from being engaged in those behaviors, the adolescents may not have respond honestly to the questions. To help avoid this, at the beginning of the data collections, the data collectors emphasized that any information that was shared would remain confidential. Overall, the current study had some threats to internal validity; however, the experiment was designed to account for these threats and eliminate the effects of them.

**External validity.** McMillan and Schumacher (2010) state that there are two general categories of external validity, which are population and ecological external validity. Population external validity emphasizes the generalizability of the study to the general population. The current study will only be able to be generalized to low socioeconomic status minority female youth. If the study has shown to be efficacious, then it can only be generalized to similar populations.

The current study was conducted in a school with students exhibiting actual concerns regarding substance use, sexual activity, and academic engagement. The true-experiment of this study and the non-laboratory setting increases the ecological external validity. However, McMillan and Schumacher (2010) state that it is not necessary to have ecological validity and that generalizability and internal validity are the most important aspects of causal inferences of treatment effects on the dependent variables.
Motivational Interviewing Training

Training for MI is important, as it is a conscious and strategic therapeutic approach (Hettema et al., 2005). There are a lot of literature, videotapes, webinars, and clinical workshops that provide adequate information and training on MI; however, it is suggested that the most effective trainings focus on helping therapist learn to identify and evoke change talk and commitment language (Hettema et al., 2005; Miller & Mount, 2001). Once a therapist is able to identify important aspects of the therapeutic dialogue, the clients then provide learning opportunities as they “provide continuous and immediate in-session reinforcement for good practice” (Hettema et al., 2005, p. 93).

The current interventionist has received extensive training in MI. The interventionist attended a seven hour seminar, “Motivational Interviewing: Overcoming Client Resistance to Change.” The training was provided by Cross Country Education, an organization that provides continuing education and professional development for healthcare professionals. The interventionist also attended an eight-hour “Advanced Motivational Interviewing” training at Western Psychiatric Institute and Clinic. Both trainings provided opportunities to practice interacting with pseudo clients and practice eliciting change talk and commitment language.

The interventionist is also well versed in MI from extensive readings such as Miller and Rollnick’s seminal work (1991, 2002, 2012) and use of training materials from Motivational Interviewing community (motivationalinterviewing.org). Finally, the interventionist has experience working on a grant funded motivational interviewing intervention study.

Procedures

After potential participants permissions were obtained – see recruitment above - the parameters of confidentiality were discussed with each participant. Participants were aware that
confidentiality would be breached if they reported imminent danger to self or others (threatens to harm herself or others) and/or abuse or neglect was been reported. Each participant was given an identification number so that all data remained confidential. The ID numbers and name of each participant was stored in a locked filing cabinet in the office of the Primary Investigator’s Supervisor and all data was kept separate from the names of the participants.

In the context of this study, sensitive subjects (i.e., sex and substance use) were addressed in conversation and not recorded in a manner that would be contributed to their educational record. Because the main focus of this study was to reduce risky behavior, when students disclosed information related to those topics it was remain confidential unless it is leading to imminent harm or was potentially lethal. Within the context of the conversations, there was the potential for discomfort or embarrassment to be felt by the participant; however, due to the dynamics of MI, most conversations were primarily led by the participant, therefore allowing the student to lean in the direction and intensity of topics discussed; this served to eliminate or significantly truncate any discomfort.

Prior to the implementation of the study, research assistances were trained for their designated roles. The data collectors were graduate students who completed the Human Subjects Research Training Certificate and were trained in confidential data collection procedures. They were trained by the primary investigator (PI) in the way in which to appropriately conduct the data collection sessions for this project. The interventionist is the PI and was well-versed in MI through experience, education and training.

The study did not pose a risk to the participant’s physical, social, legal, economic, or psychological status. There were no reports of participants experiencing any physical or mental
discomfort, harm, or injury. There was minimal risk to the students because of this study. The study posed no additional risks than routine service delivery provided in the school.

**Motivational interviewing intervention condition.** Females who were enrolled into the MI condition received eight 35 minute sessions (one session per week). The first session was a basic qualitative session in which the individual language around school, sex, and drugs was identified. Within the first session, an area of concern was identified within the context of the individual student. Following session one, sessions two and three focused on substance use, sessions four and five focused on sexual activity, and sessions six and seven focused on academic engagement. Session eight was a closing session consisting of a review of the goals and conversations from the previous sessions. Table 3.4 provides a weekly calendar for subjects.

### Table 3.4

**Week and Weekly Topic Layout**

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>Introduction and Assessment</td>
</tr>
<tr>
<td>Two</td>
<td>Substance Use</td>
</tr>
<tr>
<td>Three</td>
<td>Substance Use</td>
</tr>
<tr>
<td>Four</td>
<td>Sexual Activity</td>
</tr>
<tr>
<td>Five</td>
<td>Sexual Activity</td>
</tr>
<tr>
<td>Six</td>
<td>Academic Engagement</td>
</tr>
<tr>
<td>Seven</td>
<td>Academic Engagement</td>
</tr>
<tr>
<td>Eight</td>
<td>Assessment and Closing</td>
</tr>
</tbody>
</table>

In session one, the adolescent was a given a value sort task in which they identified three words that are very important to them out of pack of index cards with words on them. Appendix C has the list of the words that were on the index cards. One index card was left blank to allow for the student to offer a value that may not have been provided. The interventionist and the adolescent then discussed the chosen values. This activity was used to build rapport and identify possible motivations to change. Once the three values were identified and discussed, the
participants completed the color wheel activity that was designed for them to share how school, substance use, and relationships fit into their life (Appendix D). Red represented sexual relationships, blue represented school, and green represented drugs and alcohol. The participants were instructed to use the colors how they saw fit such that if they did not want use any colors because none of those topics were of importance or only use one or two colors they could.

After identifying what was important to them (i.e., value sort) and having a discussion about their perceptions of three factors, the interventionist and participant discussed how their values and the three factors were related in the context of the adolescents’ language. A discussion about their feelings, motivations, and thoughts around their current behaviors was had and then the adolescent then identified a goal pertaining to the subject. To assist in this process, the goal creation worksheet was used. The therapeutic tool is designed to discuss the value in the goal, identify barriers to the goal, actions to get around the barriers and to obtain the goal, and then what success will look like. These steps blend the SCT and MI components by addressing motivations, self-efficacy, and outcome beliefs. Using the readiness ruler, the adolescents were asked to rank where they were on already achieving their goal. The readiness ruler is ranked from one to ten with one indicating not prepared to change and ten already changing.

Sessions two through seven were formatted the same except the goals were specific to each session’s topics that were previously mentioned. Each session began with reviewing the previous week’s goal. Specifically discussed was if the goal was/was not met, what made it hard/easy, and what was the outcome. Following that, the value sort was revisited and the session topic and values were discussed. A goal will again was created using the goal creation worksheet and the ruler was used to assess where they are in making steps towards that goal.
Session eight was designed to have a therapeutic closing. The previous sessions were reviewed specifically focusing on the goals and identified motivations. At this time the adolescents decided if they want to create another goal or close the session.

**Data Collection**

Prior to enrollment in either condition, the females completed demographic forms and data packets with a research assistant (see description above). The data packets for data collections contained all previously mentioned measures. Data collection two and three contained all measures except the family and school connectedness measure and demographics questionnaire. For participants in the control group, they completed data collection two 9 weeks following data collection one. For participants in the intervention group, they completed data collection immediately (within a week of last session) following the last session. A month following the second data collection, the adolescent completed the follow up data collection procedures. On the same day of each data collection, the data collector received grades and attendance records from teachers. During each data collection, the students were provided with Gatorade and a snack.

**Data Analysis**

Graduate assistants collected the data for all participants. As mentioned before, the data was de-identified by giving each participant an identification number. The log consisting of the ID number and name was kept separately in a locked filing cabinet from the data. The data was also kept in a locked filing cabinet. The results of this study will be given to Duquesne University, as well as the board of directors and principal for the participating school.
Descriptive data will be reported in terms of aggregated means and standard deviations. This includes levels of family and school connectedness. Also reported will be descriptive statistics about sexual activity, substance use, and academic engagement behaviors.

**Research Questions and Hypotheses**

This study was driven by several questions related to the feasibility, acceptability, and effectiveness of a Motivational Interviewing intervention and adolescent self-efficacy and outcome expectations. The following questions will be investigated:

**Research Question 1**

How are academic engagement, substance use, and sexual activity self-efficacy and outcome expectancy related in adolescent females who are at-risk for or actively engaged in all three behaviors?

**Hypothesis 1.** It is expected that the academic engagement, substance use and sexual activity self-efficacy and outcome expectancy are positively related.

**Research Question 2**

What is the impact of a Motivational Interviewing intervention on adolescent females’ report of self-efficacy and outcome expectancy when those youth are considered at-risk or actively engaged in substance use and sexual activity behaviors, and are academically disengaged?

**Hypothesis 2.** It is expected that the Motivational Interviewing intervention will increase adolescent females’ self-efficacy and outcome expectancy in the engagement of positive behaviors relating to sexual activity, substance use, and academic engagement.

**Research Question 3**

What is the feasibility and acceptability of the designed program in a school setting?
Hypothesis 3. It is expected that the Motivational Interviewing intervention is feasible to implement in schools and that student acceptability will be high.
Chapter IV: Results

This chapter specifically describes the feasibility, acceptability, and effectiveness of a Motivational Interviewing (MI) intervention and adolescent self-efficacy and outcome expectations of risk behaviors. Each of the analyses addressed the following three research questions:

1. How are academic engagement, substance use, and sexual activity related in adolescent females who are at-risk for or actively engaged in all three behaviors?

2. What is the impact of a MI intervention on adolescent females’ report of self-efficacy and outcome expectancy when those youth are considered at-risk or actively engaged in substance use and sexual activity behaviors, and are academically disengaged?

3. What is the feasibility and acceptability of the designed program in a school setting?

First, correlations among the primary variables (i.e., sexual activity self-efficacy, substance use self-efficacy, and academic engagement self-efficacy and outcome expectancy) are provided. Due to variability in the scoring procedure that is allowed for by the authors of the sexual activity and substance use outcome expectancy instruments, correlations are not provided. In order to determine if the MI was an effective intervention, a non-parametric Wilcoxon Signed-Rank Test results are provided. The Wilcoxon Signed-Rank Tests were used due to the small sample size. Additionally, feasibility results will be provided based on field notes and acceptability by examining the responses from the acceptability questions. Lastly, the threats to internal and external validity of the study will be discussed at the end of this Chapter.

Participants

Participant demographics were examined at baseline and then reviewed at the completion of the study. The following sections provide the demographics for each time period.
Baseline

Participants were recruited from a Mid-Atlantic alternative high school where students were enrolled due to expulsion from their home schools or they were required to attend via probation requirements associated with their contact with the juvenile justice system. A list of 33 students who were eligible for the study was provided by the school psychologist of the participating school. Within the recruitment time frame, nine females from the list were unable to be located for recruitment. Seven of them were absent without official leave, two were absent due to medical reasons, and two were suspended for extended lengths of time. Of those referred, 24 (72.7%) were approached to be in the study. Six students were not enrolled into the study due to lack of interest from the parent (one), student (four), and both (one). Although two other females and their parents indicated their interest over the phone, written consent was never obtained, therefore, they were not enrolled in the study.

A total of 16 (48.5% of those referred, 66.6% of those approached) adolescent females were enrolled in the study. Following the start of the intervention, two students withdrew from the study. One student withdrew at the start of session two and one student withdrew at the start of session four. Of the 14 females who remained in the study, 64.3% were African American, 14.3% were Caucasian, and 21.4% were Bi-Racial. All of the participants’ first language was English. The participants were between the ages of 15 and 16 years old ($M = 15.50, SD = .52$). Despite administration confirming the all participants were either in 9th or 10th grade, the students reported being in the following grades: two in 8th, six in 9th, three in 10th, and three in 11th. Six participants repeated at least one grade (i.e., 6th grade: one, 7th grade: two, 8th grade: two, and 9th grade: one).
The majority of the participants lived in a single parent household (n = 12, 85.7%). Nine lived with their biological mother, one lived with her aunt, and two lived with their grandmothers. One participant lived with both parents and one participant was a ward of the state. All of the participants had at least one sibling ($M = 3.57, SD = 1.99$). One female was pregnant at the time of recruitment and one had a one year old infant.

**Data Collection 3**

A total of four participants completed all three data collections. Of those who completed the study, 50% were African American, 25% were Caucasian, and 25% were Bi-Racial. All of the participants’ first language was English. Three of the participants were 15 years old and one was 16 years old. Only one of the participants repeated a school grade. The majority of the participants lived in a single parent household (n = 12, 85.7%). Three of the participants lived with their mother and one lived with her aunt. None of the females who completed the study were pregnant or had children.

**Research Question One**

How are academic engagement, substance use, and sexual activity related in adolescent females who are at-risk for or actively engaged in all three behaviors?

**Family and School Connectedness**

Family connectedness and school connectedness were measured using the Hemingway Measure of Adolescent Connectedness 5.5 short form (HMAC; Karcher, 2005). Mean scores were obtained from the sum of all items per scale (i.e., parents, siblings, school, teacher, and peers). On the Parents Connectedness subscale, scores ranged from 1.33 to 4.50 ($M = 3.15, SD = .89$). Cronbach’s alpha was .85, indicating good reliability. The mean score of the Siblings Connectedness subscale was 3.33 ($SD = 1.05$). The range of scores was from 1.40 to 4.80. This
subscale had excellent reliability ($\alpha = .92$). On the School Connectedness subscale, the mean was 3.27 ($SD = .57$). The subscale’s range of scores was from 2.33 to 4.33. The School Connectedness subscale had acceptable reliability ($\alpha = .67$). The range of scores on the Teacher Connectedness subscale was from 2 to 4.83 ($M = 3.56, SD = .79$). The subscale reliability was good ($\alpha = .77$). On the Peers Connectedness subscale, the mean was 2.71 ($SD = .71$) and had a score range of 1.50 to 4.00. Subscale reliability was good ($\alpha = .78$).

**Substance Use**

*Descriptive items.* The participants answered questions about cigarette, alcohol, and illicit drug use using a modified version of the 2013 National Youth Risk Behavior Survey (YRBS; CDC, 2013a). Regarding cigarettes, all but two adolescents tried a cigarette. With four of them having their first cigarette before the age of 13 years old. Three participants reported having smoked a cigarette every day for the month prior to data collection one (DC1; baseline). Five of the adolescent did not smoke cigarettes at all in that month. One participant reported that she used chewing tobacco once that month and four reported they smoked some form of a cigar.

The participants were asked about their drug use over their life time and in the 30 days leading up to DC1 (baseline). Two students reported never having drunk alcohol before. The earliest age participants reported trying alcohol was less than eight years old (two participants). Of the adolescents, 37.2% first tried alcohol at or after the age of 13. In the month leading up to DC1 (baseline), 50% of the females did not drink alcohol. Two participants reported drinking more than six days of the month. Four females reported having binged drank, or having 5 or more drink of alcohol in a row, at least two days of the month.

Regarding drug use, the participants were asked about the use of marijuana, cocaine, inhalants, heroin, methamphetamine, ecstasy, non-prescribed prescription drugs, and drug
injections. More questions pertaining to marijuana were asked when compared to the other drugs. Only two participants reported never trying marijuana. Almost half of the females reported that they used marijuana more than 100 times in their life time. Of those who have used marijuana, 64% reported their first time was before the age of 15. In the 30 days before DC1 (baseline) eight of the females stated they smoked marijuana. None of the participants reported ever using inhalants, heroin, methamphetamine, or injection drugs. One female reported trying cocaine, two reported trying ecstasy, and four reported illegally using prescription drugs. Of those who illegally used prescription drugs, one of them reported using them more than 40 times in her lifetime.

**Self-efficacy.** Substance use self-efficacy was measured using the Drug Use Resistance Self-Efficacy Scale (DURSE; Carpenter & Howard, 2009). All items were summed to obtain the final score. The possible range for scores on the DURSE is from 24 to 96. Higher scores indicate greater resistance self-efficacy. For this group, the on average they reported to have high resistance self-efficacy ($M = 74.57, SD = 20.01$). The median score was 78.50 and the scores ranged from 24 to 96, indicating negatively skewed responses for these participants. The DURSE showed to be a reliable instrument with a Cronbach’s alpha of .98.

**Outcome expectancy.** The Cognitive Appraisal of Risky Events Revised (CARE-R) was used to measure negative and positive outcome expectations regarding substance use (Fromme, Katz, & Rivet, 1997). The scoring system provided for the CARE-R was inaccurate and unreliable. When the author was contacted for the appropriate scoring tools it was communicated that the user of the tool could theoretically chose items to make scales that the user was interested in. Due to the lack of reliability and the inability to conduct a functional analysis due to small sample size, the results of this tool were examined at item-level.
Examination of the participants’ belief that they would experience a risk when engaging in substance use was measured using a 7-point likert scale (1 to 7). Participants’ responses ranged between 3.43 and 4.36; thus, indicating that participants found moderate risk of using substances. However, when examining the likelihood of experiencing benefits when engaging in substance use, most participants reported that they were “not at all likely” to experience benefits as indicated by the low and small range of scores (1 to 2.14).

**Sexual Activity**

**Descriptive items.** The participants answered questions about their sexual activity using the modified version of the YRBS (CDC, 2013a). All fourteen participants reported having had sex at least once. One female reported having sex before the age of 12 and over half of the females had sex before the age of 15. In relation to how many partners the participants had, 79.6% had more than one partner. Six of the females reported having more than four partners. In the three months prior to DC1 (baseline), 71.4% of the participants reported having sex with more than one person with one reporting having sex with more than four people. Five females reported using drugs or alcohol during their last sexual intercourse. Only 57.1% of the females reported using a condom during their last sexual intercourse. However, 71.4% reported using one method of pregnancy prevention (i.e., condoms, IUD, shot, and birth control) during their last intercourse.

**Self-efficacy.** Cecil and Pinkerton (1998) created a tool to measure self-efficacy in Refuse Sexual Intercourse, Question Potential Sex Partners, and Condom Use. Similar to the DURSE, higher summed scores indicated higher self-efficacy for all scales. For the Refuse Sexual Intercourse subscale, scores could range from 8 to 40. Results indicated a range of scores from 11 to 36 ($M = 26.07$, $SD = 8.58$). On the Question Potential Sex Partner subscale, scores
could range from 5 to 25. Results indicated an average of 21.57 ($SD = 4.05$) and a range of 15 to 25. The scores of the Condom Use subscale could range from 8 to 40. Results showed a range of 12 to 40 ($M = 32.00, SD = 9.27$). Reliability coefficients ranged from good to excellent for Refuse Sexual Intercourse, Question Potential Sex Partners, and Condom Use subscales ($\alpha = .89, .75, \text{ and } .93$, respectively).

**Outcome expectancy.** The Cognitive Appraisal of Risky Events Revised (CARE-R) was used to measure negative and positive outcome expectations regarding substance use (Fromme, Katz, & Rivet, 1997). As mentioned earlier, the scoring for the scale was impossible. Therefore, the means were calculated for all items. When examining the likelihood of experiencing a risk when engaging in sexual activity, the participants’ responses stayed between 2.36 and 4.21. These results were similar to that of Substance Use outcome expectancy, indicating that participants found moderate to low risk of engaging in sexual activity. Again, similar results were found for the likelihood of experiencing benefits when engaging in sexual activity when compared to substance use outcome expectancy. Most participants reported that they were “not at all likely” to experience benefits as indicated by the low to moderate range of scores (1.29 to 5.50).

**Academic Engagement**

**Descriptive items.** The participants’ attendance records and grades were collected at DC1 (baseline). Attendance records covered from the participants first day of enrollment at the school. The students as a whole had a large amount of instructional days lost both with unexcused and excused absences ($M = 11.64, SD = 8.38; M = 8.29, SD = 7.86$, respectively). On average, the participants were at school 82.1% of the time. However, three students were at school less than 70% of their enrollment, and one of those three was at school almost only half of
the expected time. Table 4.1 includes grade percentage means, standard deviations, minimums, and maximums. Only 13 participants’ grades were collected due to no reports given for one student. Grades are often related to student engagement as those engaged typically do better in school than those who are not. Those who are have higher levels of academic achievement self-efficacy have higher grades as well. Students appeared to struggle the most in their core classes, math and English, but also science. In gym, health, and research/writing, the participants on average were receiving a qualitative grade of a B.

**Self-efficacy.** Two subscales from the Children’s Multidimensional Self-Efficacy Scales (CMSES; Bandura, 2006b) were used to measure academic engagement self-efficacy (i.e., Academic Achievement Self-Efficacy and Self-Regulated Learning Self-Efficacy). Both subscales scores were obtained from averaging the items of each subscale. The score ranges could be from 0 to 100 and higher scores indicate higher self-efficacy. On the Academic Achievement Self-Efficacy subscale, the scores ranged from 58.89 to 100, \( M = 77.70, SD = 10.83 \). Reliability for this scale was acceptable \( (\alpha = .60) \). Self-Regulated Learning Self-Efficacy scores ranged from 38 to 100 \( (M = 67.43, SD = 19.71) \). Thus, indicating lower self-regulated learning self-efficacy scores than academic achievement self-efficacy scores. Reliability was excellent for the Self-Regulated Learning Self-Efficacy \( (\alpha = .90) \).

**Outcome expectancy.** Academic engagement outcome expectancy was measured using the Secondary version of the Student Opinion Survey (SOS; McMillan, Simonetta, & Singh, 1994). Scores were obtained by averaging all of the items in each scale. Similar to all the previously mentioned tools, higher scores indicate higher self-efficacy levels. Scores for all scales ranged from one to five. On the General Attitude subscale, scores ranged from two to five.
Participants Academic Grades at Data Collection One (Baseline)

<table>
<thead>
<tr>
<th>Subject</th>
<th>M (SD)</th>
<th>Mdn</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math</td>
<td>68.15 (24.14)</td>
<td>62</td>
<td>34</td>
<td>100</td>
</tr>
<tr>
<td>Science</td>
<td>73.46 (24.50)</td>
<td>78</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>English</td>
<td>73.62 (17.40)</td>
<td>77</td>
<td>35</td>
<td>93</td>
</tr>
<tr>
<td>Gym</td>
<td>81.46 (16.43)</td>
<td>88</td>
<td>42</td>
<td>100</td>
</tr>
<tr>
<td>Health</td>
<td>81.38 (16.38)</td>
<td>88</td>
<td>42</td>
<td>100</td>
</tr>
<tr>
<td>Research/Writing</td>
<td>86.23 (10.98)</td>
<td>89</td>
<td>65</td>
<td>96</td>
</tr>
<tr>
<td>Social Studies</td>
<td>77.15 (19.13)</td>
<td>80</td>
<td>32</td>
<td>98</td>
</tr>
</tbody>
</table>

(M = 3.54, SD = .99). Reliability for this scale was good (α = .85). The English Attitude subscale had scores ranging from 1.75 to 5 (M = 3.68, SD = .82). Cronbach’s alpha for this scales was .50, indicating poor reliability. On the Math Attitude subscale, the average score was 4.11 (SD = .62) and had a range of scores from three to five. This subscale had unacceptable reliability (α = .32). The last subscale, Science Attitude, had a mean of 3.29 (SD = 1.00) and a range of scores from 1.75 to 5. Results indicated the scale had good reliability (α = .72). Each instrument’s reliabilities are reported below in each section and in Table 4.2.

Correlations at Baseline

Bivariate correlations were run for all baseline variables (i.e., sexual activity self-efficacy, drug use self-efficacy; school and family connectedness; and academic engagement self-efficacy and outcome expectancy), except for sexual activity and substance use outcome expectancy (Table 4.3). The initially proposed analyses included controlling for Family and School Connectedness; however, due to the study’s high attrition those proposed analyses were not ran. Therefore, the bivariate correlations of School Connectedness and Family Connectedness with each previously mentioned variables were examined. There were four
Table 4.2

<table>
<thead>
<tr>
<th></th>
<th>DC1  (n = 14)</th>
<th>DC2  (n = 8)</th>
<th>DC3  (n = 4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMAC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parent Connectedness</td>
<td>.85</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Siblings Connectedness</td>
<td>.92</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>School Connectedness</td>
<td>.67</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Teacher Connectedness</td>
<td>.77</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Peer Connectedness</td>
<td>.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DURSE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protective Sexual Behaviors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refuse Sexual Intercourse</td>
<td>.90</td>
<td>.93</td>
<td>.93</td>
</tr>
<tr>
<td>Questioning Partner</td>
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<tr>
<td>English Attitude</td>
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Statistically significant correlations were found for School and Family Connectedness. There was a statistically significant negative correlation between Teacher Connectedness and Condom Use ($r = -.60$, $p < .05$). There was also a statistically significant positive correlation found between Teacher Connectedness and School Connectedness ($r = .63$, $p < .05$). There was a statistical significant positive correlation between Sibling Connectedness and General Attitude ($r = .68$, $p < .01$) and Sibling Connectedness and English Attitude ($r = .60$, $p < .05$).

There were no statistically significant relationships found with Drug Use Resistance Self-Efficacy. There was a statistically significant positive correlation between Questioning Partner
Self-Efficacy and Refuse Sexual Intercourse self-efficacy, $r = .73, p < .01$. There were four statistically significant relationships between academic self-efficacy and outcome expectancy domains. General Attitude (outcome expectancy) was statistically significantly correlated with Academic Achievement Self-Efficacy ($r = .58, p < .05$), Self-Regulated Learning Self-Efficacy ($r = .55, p < .05$), and Science Attitude (outcome expectancy; $r = .69, p < .01$). Science Attitude was also statistically significantly correlated with English attitude (outcome expectancy; $r = .57, p < .05$). No other academic achievement self-efficacy or outcome expectancy variables were statistically significantly related to the primary variables. Again, all bivariate correlations are provided in Table 4.3.

**Research Question Two**

What is the impact of a MI intervention on adolescent females’ report of self-efficacy and outcome expectancy when those youth are considered at-risk or actively engaged in substance use and sexual activity behaviors, and are academically disengaged?

**Statistical Analyses**

For this research question, the effect of the MI intervention on substance use and sexual activity outcome expectancies were not examined due to variability in the scoring procedure that is allowed for by the authors of the sexual activity and substance use outcome expectancy instruments. Academic self-efficacy and outcome expectancy, substance use self-efficacy, and sexual activity self-efficacy were analyzed for the control and intervention groups by using the Wilcoxon Signed-Rank Test. The Wilcoxon Signed-Rank Test analyses were run to assess treatment effects for the three participants that completed the intervention and DC2. It was also run to assess time effects for five control group participants between DC1 (baseline) and DC2. The Wilcoxon Signed-Rank Tests were chosen due to the small sample size and the data being
not normally distributed. There are three assumptions for the Wilcoxon signed-rank tests. They are “Each Pair of Observations Must Represent a Random Sample from a Population and Must be Independent of Every Other Pair of Observations,” “The z Tests for the Three Tests Yield Relatively Accurate Results to the Extent That the Sample Size is Large,” and “The Distribution of the Difference Scores is Continuous and Symmetrical in the Population” (Green & Salkind, 2011).

The first assumption was met as the paired scores for each subject was independent of the paired scores of any other matched pair of participants. The second assumption was also met; however, results should be interpreted with caution as the sample size is below 16. Therefore, there are less than 16 pairs of nontied scores and it can affect the accuracy of the approximate p value. The last assumption was met for all scales except intervention group Drug Resistance Self-Efficacy (one tie) as there were some non-different scores thus creating ties. For the control group, there were ties found for Condom Use Self-Efficacy (three ties), Science Attitude (one tie), and Math Attitude (one tie). The scales with ties should be interpreted with caution. Visual analysis was also conducted and graphs are provided for each section.

For all participants who completed all three data collections, visual analyses were conducted and supplemental graphs are also presented. For the intervention participant who completed all three data collections, the percentage of non-overlapping data (PND) points were calculated for each variable. Scruggs, Mastropieri, and Casto (1986) state that using the PND provides researchers with the effectiveness of the intervention. To calculate the PND, first non-overlapping data points are counted. Non-overlapping data points are the intervention phase data points that are above the highest baseline data point. Then, the proportion of non-overlapping intervention points is divided by the total number of intervention data points (Scruggs et al.,
Table 4.3

Correlations of Baseline Self-Efficacy and Outcome Expectancy Data

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* = p < .05, ** = p < .01
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* = p < .05, ** = p < .01
The portion then determines the effectiveness of the intervention. The following are the portions and qualitative descriptors: ≥90% is highly effective, 70-90% is moderately effective, 50-70% is minimally effective, and <50% is ineffective. Richards, Taylor, Ramasamy, and Richards (1999) state that the preferred standard is to have at minimum three intervention data points, but this is not the set standard.

**Non-Parametric Wilcoxon Signed-Rank Tests**

**Intervention group substance use self-efficacy.** A Wilcoxon Signed-Rank Test was conducted to evaluate whether the MI intervention affected the participants’ substance use resistance self-efficacy via scores from the DURSE. The results indicated that the median DURSE score at DC2 (Mdn = 96.00, M = 92.00, SD = 6.93) was not significantly different than the median DURSE score at DC1 (baseline; Mdn = 93.00, M = 91.33, SD = 5.69), z(3) = -.45, p = .66. The standardized effect size index was calculated using the equation \( r = \frac{z}{\sqrt{N}} \) and resulted in an effect size of -0.18, indicating a small effect size. Post hoc calculation of achieved power, given the sample size and effect size was computed using the G*Power program version 3.1.9.2. A power of .05 was calculated, indicating low probability of rejecting the null hypothesis when the alternate hypothesis is true. The visual graph of change between DC1 (baseline) to DC2 is shown in Figure 4.1.
Figure 4.1. Intervention participants’ drug use resistance self-efficacy scores across DC1 and DC2.

**Control group substance use self-efficacy.** A Wilcoxon Signed-Rank Test was conducted to evaluate whether there were time effects on the control group participants’ substance use resistance self-efficacy via scores from the DURSE. The results indicated that the median DURSE score at DC2 ($Mdn = 72.00, M = 75.80, SD = 20.72$) was not significantly different than the median DURSE score at DC1 (baseline; $Mdn = 79.00, M = 76.80, SD = 10.33$), $z(5) = -.41, p = .68$. The standardized effect size is -0.13, indicating a small effect size. Power analysis indicated a power of .06. The visual graph of change from DC1 (baseline) to DC2 is shown in Figure 4.2.
Control participants’ drug use resistance self-efficacy scores across DC1 and DC2.

**Intervention group sexual activity self-efficacy.** A Wilcoxon Signed-Rank Test was conducted to evaluate whether the MI intervention affected the participants’ Refuse Sexual Intercourse, Questioning Partner, and Condom Use self-efficacy via scores from the Sexual Activity Self-Efficacy Scale. The median Refuse Sexual Intercourse self-efficacy score at DC2 (\(Mdn = 37.00, M = 33.33, SD = 7.23\)) was not significantly different than the median Refuse Sexual Intercourse self-efficacy score at DC1 (baseline; \(Mdn = 35.00, M = 32.67, SD = 4.93\)), \(z(3) = .58, p = .56\). The standardized effect size index was -0.23, indicating a small effect size. The calculated power was .06. The results for Questioning Partner self-efficacy showed no significant difference between DC1 (baseline) and DC2, \(z(3) = -1.00, p = .32\). The median of the Questioning Partner self-efficacy at DC1 (baseline) was 25.00 (\(M = 23.67, SD = 2.31\)) and the median at DC2 was 25.00 (\(M = 22.67, SD = 4.04\)). Effect size was -0.41 which is a medium effect size. The calculated power was .07. The results indicated that the median Condom Use self-efficacy score at DC2 (\(Mdn = 38.00, M = 34.67, SD = 7.57\)) was not significantly different than the median Condom Use self-efficacy score at DC1 (baseline; \(Mdn = 35.00, M = 34.00, SD = 4.04\)).
= 4.58), \( z(3) = -0.27, p = .79 \). Effect size for Condom Use self-efficacy was -0.11 which is a small effect size. The calculated power was .05. Figure 4.3 shows the visual graphs of changes from DC1 (baseline) to DC2.
Control group sexual activity self-efficacy. A Wilcoxon Signed-Rank Test was conducted to evaluate whether time effects occurred for the control group participants’ Refuse Sexual Intercourse, Questioning Partner, and Condom Use self-efficacy via scores from the Sexual Activity Self-Efficacy Scale. The results indicated that the median Refuse Sexual Intercourse self-efficacy score at DC2 (\(Mdn = 17.00, M = 23.40, SD = 10.67\)) was not significantly different than the median Refuse Sexual Intercourse self-efficacy score at DC1 (baseline; \(Mdn = 17.00; M = 18.20, SD = 8.41\)), \(z(5) = -1.48, p = .14\). The standardized effect size index was -0.47, indicating a medium effect size. The calculated power was .12. The results for Questioning Partner self-efficacy showed no significant difference between DC1 (baseline) and DC2, \(z(5) = -.41, p = .68\). The median of the Questioning Partner self-efficacy at DC1 (baseline) was 17.00 (\(M = 19.20, SD = 4.49\)) and the median at DC2 was 16.00 (\(M = 16.20, SD = 6.38\)). Effect size was -0.13 which is a small effect size. The calculated power was .06.

For the Condom Use self-efficacy scale participant 4 was removed from the analysis because she did not complete the scale at DC1 (baseline). Therefore, the analysis only consists of four control group participants. The results indicated that the median Condom Use self-
efficacy score at DC2 ($Mdn = 31.00, M = 28.50, SD = 13.89$) was not significantly different than the median Condom Use self-efficacy score at DC1 (baseline; $Mdn = 29.50, M = 27.75, SD = 14.43$), $z(4) = -1.00, p = .32$. Effect size for Condom Use self-efficacy was -0.35 which is a medium effect size. The calculated power was .08. The visual graphs of changes between DC1 (baseline) to DC2 for all scales are shown in Figure 4.4.
Figure 4.4. Control participants’ sexual activity self-efficacy scores across DC1 and DC2.

**Intervention group academic engagement self-efficacy.** A Wilcoxon Signed-Rank Test was conducted to evaluate whether the MI intervention affected the participants’ Academic Achievement and Self-Regulated Learning self-efficacy via scores from the Children’s Multidimensional Self-Efficacy Scales (CMSES; Bandura, 2006b). The results indicated that the median Academic Achievement self-efficacy score at DC2 ($Mdn = 80.00, M = 82.59, SD = 16.27$) was not significantly different than the median Academic Achievement self-efficacy score at DC1 (baseline; $Mdn = 62.22; M = 67.04, SD = 11.35$), $z(3) = -1.07, p = .29$. There was a medium effect size ($r = -0.44$). Calculated power was .07. The results for Self-Regulated Learning self-efficacy showed no significant difference between DC1 (baseline) and DC2, $z(3) = .00, p = 1.00$. This statistic was found due to the sum of negative ranks equaling the sum of positive ranks. The median of the Self-Regulated Learning self-efficacy scores at DC1 (baseline) was 79.00 ($M = 72.33, SD = 12.42$) and the median at DC2 was 84.00 ($M = 76.67, SD = 22.90$). Neither the effect size nor the power were calculated. The visual graphs of changes between DC1 (baseline) to DC2 for all scales are shown in Figure 4.5.
Control group academic engagement self-efficacy. A Wilcoxon Signed-Rank Test was conducted to evaluate whether there were time effects for the control group participants’ Academic Achievement and Self-Regulated Learning self-efficacy via scores from the Children’s Multidimensional Self-Efficacy Scales (CMSES; Bandura, 2006b). The results indicated that the median Academic Achievement self-efficacy score at DC2 ($Mdn = 82.22, M = 77.11, SD = 16.75$) was not significantly different than the median Academic Achievement self-efficacy score at DC1 (baseline; $Mdn = 82.22; M = 84.22, SD = 11.50$), $z(5) = -.94, p = .35$. There was a medium effect size ($r = -0.30$). Calculated power was .08. The results indicated that the median Self-Regulated Learning self-efficacy score at DC2 ($Mdn = 69.00, M = 63.53, SD = 17.40$) was not significantly different than the median Academic Achievement self-efficacy score at DC1 (baseline; $Mdn = 73.00; M = 67.20, SD = 25.25$), $z(5) = -.67, p = .50$. Effect size for Self-Regulated Learning self-efficacy was -0.20 which is a small effect size. The calculated
power was .06. The visual graphs of changes between DC1 (baseline) to DC2 for all scales are shown in Figure 4.6.

**Figure 4.6.** Control participants’ academic engagement self-efficacy scores across DC1 and DC2

**Intervention group academic engagement outcome expectancy.** A Wilcoxon Signed-Rank Test was conducted to examine if the MI intervention affected the participants’ Academic Achievement outcome expectancy levels. Scores were derived from the Student Opinion Survey (SOS; McMillan, Simonetta, & Singh, 1994). For the General Attitude subscale, results indicated that the median score at DC2 (\(Mdn = 4.17, M = 3.89, SD = .63\)) was not significantly different than the median at DC1 (baseline; \(Mdn = 2.67, M = 2.72, SD = .75\)), \(z(3) = -1.07, p = .29\). Effect size for this scale was -0.43 which is a medium effect size. The power for this analysis was .07. The results for English Attitude showed no significant difference between DC1 (baseline) and DC2, \(z(3) = -.58, p = .56\). The median of the English Attitude score at DC1 (baseline) was 3.75 (\(M = 3.58, SD = .52\)) and the median at DC2 was 3.75 (\(M = 3.67, SD = .38\)). Effect size for this scale was -0.24 which is a small effect size. The power for this analysis was
The results indicated that the median Math Attitude score at DC2 ($\text{Mdn} = 4.25, M = 4.00, SD = 0.43$) was not significantly different than the median Math Attitude score at DC1 (baseline; $\text{Mdn} = 4.50, M = 4.17, SD = 1.04$), $z(3) = -.54, p = .59$. A small effect size was calculated ($r = -0.22$). Results of the power analysis indicated low power as .06. The results indicated that the median Science Attitude score at DC2 ($\text{Mdn} = 3.25, M = 3.17, SD = 1.38$) was not significantly different than the median Science Attitude score at DC1 (baseline; $\text{Mdn} = 2.50, M = 2.50, SD = .50$), $z(3) = -.54, p = .59$. For this scale, there was a small effect size (-0.22) and the power was .06. Figure 4.7 shows the changes from DC1 (baseline) to DC2.
Control group academic engagement outcome expectancy. A Wilcoxon Signed-Rank Test was conducted to examine time effects for the control group participants’ Academic Achievement outcome expectancy levels. Scores were derived from the Student Opinion Survey (SOS; McMillan, Simonetta, & Singh, 1994). For the General Attitude subscale, results indicated that the median score at DC2 (Mdn = 4.33, M = 4.05, SD = 0.86) was not significantly different than the median at DC1 (baseline; Mdn = 3.50, M = 3.71, SD = 1.08), z(5) = -.68, p = .50. Effect size for this scale was -0.22 which is a small effect size. The power for this analysis was .07. The results for English Attitude showed no significant difference between DC1 (baseline) and DC2, z(5) = -1.08, p = .28. The median of the English Attitude score at DC1 (baseline) was 3.67 (M = 3.38, SD = .99) and the median at DC2 was 4.00 (M = 3.90, SD = .92). Effect size for this scale was -0.34 which is a medium effect size. Power was .09.

The results indicated that the median Math Attitude score at DC2 (Mdn = 4.75, M = 4.43, SD = .66) was not significantly different than the median Math Attitude score at DC1 (baseline; Mdn = 3.75, M = 4.07, SD = .67), z(5) = -1.29, p = .20. A medium effect size was calculated (r
Results of the power analysis indicated low power as .11. The results indicated that the median Science Attitude score at DC2 ($Mdn = 2.75, M = 3.50, SD = 1.27$) was not significantly different than the median Science Attitude score at DC1 (baseline; $Mdn = 3.50, M = 3.70, SD = 1.16$), $z(5) = -0.37, p = .72$. Effect size for this scale was -0.12 which is a small effect size. The power for this analysis was .05. The visual graphs for all subscales are shown in Figure 4.8.

Figure 4.8. Control participants’ academic engagement outcome expectancy scores across DC1 and DC2.
Visual Analysis for Participants with Three Data Collections

**Intervention group substance use self-efficacy.** At baseline, participant 5 had a Drug Use Resistance Self-Efficacy score of 93 according to the DURSE. After completing the intervention, results from DC2 showed that DURSE score went up three points, to 96. This score was maintained at DC3. From a visual analysis of participant 5’s results across time revealed that the data points were two (100%) non-overlapping between the baseline and the intervention data points. This data indicated that the scores minimally increased after the intervention which indicates the intervention is highly effective. However, there are only two intervention data points so this needs to be interpreted with caution. Figure 4.9 summarizes the results for participant 5’s DURSE scores.

![SE - Drug Use](image)

*Figure 4.9.* Intervention participant 5 drug use resistance self-efficacy scores across time.

**Control group substance use self-efficacy.** At baseline, the control group participants had Drug Use Resistance self-efficacy scores ranging from 59 to 84 according to the DURSE. Participant 1’s DURSE scores began at 59, and then at DC2 was 45, and then at DC3 was at 48. This indicated a decline of 14 points initially and then a three point increase by DC3. For participant 4, DURSE scores increased over time from 79 to 94 to 96. Lastly, for participant 9,
Her scores initially decreased then increased by DC3. Her scores for DC1 (baseline), DC2, and DC3 were 84, 72, and 96 respectively. The visual analysis of the control group participant’s results across time revealed that there was no pattern of scores across time. Figure 4.10 provides the graphic representation of the results for the control group participants’ DURSE scores.

Figure 4.10. Control participants’ drug use resistance self-efficacy scores across time.

**Intervention group sexual activity self-efficacy.** Data patterns for the sexual activity self-efficacy scales indicated a negative effect of the intervention. Participant 5 had a Refuse Sexual Intercourse self-efficacy scale score of 27 at baseline. The score went down by two points at DC2 then went back to 27 at DC3. For the Questioning Partner self-efficacy scale, the score at baseline was 21. At DC2 this score went down to 18 then rose to 23 at DC3. Scores decreased across data collections for Condom Use self-efficacy. At DC1 (baseline), participant 5’s score was 29 then decreased to 26 at DC2 and then to 21 at DC3. From a visual analysis of participant 5’s results across time revealed that there were zero (0%) non-overlapping data points for Refuse Sexual Intercourse self-efficacy and Condom Use self-efficacy. There was one non-overlapping data points for the Questioning Partner self-efficacy scale. Figure 4.11 summarizes the results for participant 5’s sexual activity self-efficacy scores.
Figure 4.11. Intervention participant 5 sexual activity self-efficacy scores across time.
**Control group sexual activity self-efficacy.** Data patterns for the sexual activity self-efficacy scales indicated a variable time effect for each participant and construct. Specifically examining the Refuse Sexual Intercourse self-efficacy scale, there was an increase of self-efficacy from DC1 (baseline) to DC3 for all participants. For participant 1, there was a three point dip in her score at DC2 and then an increase of five points at DC3. Participants 4 and 9 increased their scores at each data collection. Participant 4 increased by two points at each data collection (i.e., DC1 = 12, DC2 = 14, and DC3 = 16). Participant 9 had a Refuse Sexual Intercourse self-efficacy scale score of 17 at baseline. The participants’ score went up by 17 points at DC2 then continued upward by 16 points at DC3.

For the Questioning Partner self-efficacy scale, none of the participants score increased when comparing DC1 (baseline) to DC3. Participant 4’s score increased by one point at DC2 but then dropped back down by one point to her baseline score at DC3. Participants 1 and 9’s scores decreased at DC2; however, participant 1’s score increased at DC3 while participant 9’s score continued to decrease. Participant 1’s scores for each data collection were in order were 16, 11, and 13 and participant 9’s scores were 25, 9, and 5.

For the Condom Use self-efficacy scale, participant 4’s scores were removed again because she did not have scores at DC1 (baseline). For the control group participants who completed all three data collections, there was a small increase of scores across time. Participant 1’s score increased by three points to 22 at DC2 and was maintained at DC3. Participant 9’s score of 12 at DC1 (baseline) was maintained at DC2 and then increased by one points at DC3. Visual analysis of the data indicated minimal growth in Condom Use self-efficacy scores over time. Figure 4.12 provides the graphs the results for all control group participants’ sexual activity self-efficacy scores.
Figure 4.12. Control participants’ sexual activity self-efficacy scores across time.
**Intervention group academic engagement self-efficacy.** Data patterns for the Self-Regulated Learning and Academic Achievement self-efficacy scales indicated immediate negative effects of the intervention. Participant 5’s Self-Regulated Learning self-efficacy scale score at baseline was 79. The score went down to 51 at DC2 then went back to 70 at DC3. For the Academic Achievement scale, the score at baseline was 80. At DC2 this score went down to 67.78 then rose to 70 at DC3. From a visual analysis of participant 5’s results across time revealed that the data points zero (0%) non-overlapping intervention data points for both scales with the baseline data. This data indicated that the scores minimally decreased following the intervention for all scales. Figure 4.13 summarizes the results for participant 5’s academic engagement self-efficacy scores.

![Figure 4.13](image)

**Figure 4.13.** Intervention participant 5 academic engagement self-efficacy scores across time.

**Control group academic engagement self-efficacy.** Data patterns for the Self-Regulated Learning and Academic Achievement self-efficacy scales did not show similar patterns across time between control group participants. For the Self-Regulated Learning self-efficacy scale, participant 1 increased her scores across time (DC1 = 38, DC2 = 56.67, and DC3
Participant 9 should the opposite pattern and had decreasing scores across time (DC1 = 100, DC2 = 82, and DC3 = 54). Lastly, participant 4’s score decreased by 6 points at DC2 and then increased by 19 points at DC3 (DC1 = 79, DC2 = 73, and DC3 = 92).

For the Academic Achievement self-efficacy scale, similar patterns emerged for participants 1 and 9 such that they decreased at DC2 and then increased at DC3 but did not pass baseline scores. Participant 1’s scores are as follows: DC1 (baseline) was 76.67, DC2 was 50, and DC3 was 70. Participant 9’s scores are as follows: DC1 (baseline) was 100, DC2 was 82.22, and DC3 was 87.78. Finally, participant 4’s score increased at DC2 and then was maintained at DC3 (DC1 = 82.22, DC2 = 94.44, and DC3 = 94.44). Figure 4.14 graphically summarizes the results for the control group participants’ academic engagement self-efficacy scores.

Figure 4.14. Control participants’ academic engagement self-efficacy scores across time.

Intervention group academic engagement outcome expectancy. Data patterns for the academic engagement outcome expectancy scales indicated variable effects of the intervention. Participant 5’s General Attitude scale score at baseline was 3.5. The score went down to 3.17 at DC2 then went back to 3.83 at DC3. For the English Attitude scale, the score at baseline was 3.
At DC2 this score went up to 3.25 then maintained at DC3. Math Attitude was at 5 at baseline and decreased to 4.25 at DC2. Participant 5’s Math Attitude score went up to 4.75 at DC3. Science Attitude increased from baseline (score of 2) to DC2 (score of 4.5). It then decreased to 3.75 at DC3.

From a visual analysis of participant 5’s results across time revealed that there was one non-overlapping data point for General Attitude but it was after a decrease immediately following intervention. There were two (100%) non-overlapping data points for Science and English Attitude. Math Attitude had zero (0%) non-overlapping data points. Figure 4.15 summarizes the results for participant 5’s academic engagement outcome expectancy scores.
Control group academic engagement outcome expectancy. Data patterns for the academic engagement outcome expectancy scales indicated variable time effects for all participants. For the General Attitude scale scores each participant displayed a different pattern from each other across time. Participant 1 had a steady increase over time (DC1 = 2.20, DC2 = 2.80, and DC3 = 3.40). Participant 9 had a steady decline across time (DC1 = 4.67, DC2 = 4.33, and DC3 = 3.17). Participant 4 had an initial decrease in score by .33 at DC2, but then increased her score by .50 to her highest General Attitude scale score at DC3 (DC1 = 4.83, DC2 = 4.50, and DC3 = 5.00).

Similar to the General Attitude scale, the pattern for the English Attitude scale scores across time varied between participants. Participant 1’s score decreased at DC2 and then increased at DC3 but it was not higher than her baseline score (DC1 = 3.67, DC2 = 2.67, and DC3 = 3). For participant 4, her score from DC1 (baseline) to DC2 increase by .25 points and then was maintained at DC3 (DC1 = 4.25, DC2 = 4.5, and DC3 = 4.5). Participant 9’s score

Figure 4.15. Intervention participant 5 academic engagement outcome expectancy scores across time.
increased by 1 at DC2 and then decreased by 1 back to baseline at DC3 (DC1 = 4, DC2 = 5, and DC3 = 4).

On the Math Attitude scale, the scores varied across time when comparing participants. Participant 1’s score of 3.33 was maintained at DC2 and then increased by .34 to 3.67 at DC3. Participant 4’s score increased from 4.5 to 4.75 at DC2 and was maintained at DC3. Participant 9’s score began at 5 then dropped by .25 to 4.75 at DC2, and then increased back to baseline at DC3.

Lastly and similarly to the previous academic engagement outcome expectancy scales, participants’ score patterns varied on the Science Attitude scale. Participant 1’s scores decreased from 3 to 2.33 at DC2 and then was maintained at DC3. Participant 4’s score at DC1 (baseline) was 4.75 and this score was maintained at DC2 and DC3. Participant 9’s score was 5 at DC1 (baseline) and then dropped 2.25 points at DC2. At DC3, participant 9’s score increased to 3.25.

For a visual analysis of all control group participants’ results across time are graphically presented in Figure 4.16.
Research Question Three

What is the feasibility and acceptability of the designed program in a school setting?

Feasibility

**Research.** Research feasibility data included recruitment and data collection completion rates and barriers and facilitators involved in working in the alternative school as recorded in field notes. As mentioned earlier, 33 students were eligible for the study per referral from the school psychologist. Due to students being absent without official leave (21.2%), medical reasons (6.1%), and suspension (6.1%), only 24 of the 33 eligible females (72.7%) were approached during the five week recruitment window. Interest in the study also interfered with recruitment. Of the 24 students approached, 4.2% did not enroll due to lack of parental interest, 16.7% did not enroll due to lack of student interest, and 4.2% did not enrolled due to both parental and student interest. That led to a total of 18 students who were interested in enrolling in the study as well as their parents and guardians having interest. Two students were interested in the study and their parents gave oral consent to participate; however, written consent was
never obtained thus eliminating them from the final study. A total of 16 (48.5% of those referred, 66.6% of those approached) females enrolled in the study.

The total time it took to complete the data collection packets per data collection and the amount of weeks it took to complete all three data collections were calculated. All but one participant completed all data collections within 25 to 35 minutes. The participant who did not complete her data collections within that time frame completed it within 50 to 60 minutes. This participant needed to have all the items read to her thus leading to a longer data collection period. Data collection two was completed on average 9.6 (SD = 1.06) following DC1 (baseline). Data collection three was completed on average 2.7 (SD = .50) weeks after DC2. This was close to the planned schedule of nine weeks for DC2 and three weeks for DC3. Data collection three was shortened due to the end of the academic year.

Retention at each data collection was also analyzed and is provided in detail in Table 4.4. A total of eight students (57.1%) completed DC2. Of them, five participants were in the control group and three participants were in the intervention group. At DC3, only four (28.6%) students were available for data collection. Of them, three were in the control group and one was in the intervention group. Similarly to the same issues of recruitment, most of the attrition was due to medical issues and truancy.

Table 4.4

<table>
<thead>
<tr>
<th>Condition (Total Participants at DC1)</th>
<th>Data Collection 2</th>
<th>Data Collection 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control (n = 8)</td>
<td>62.5%</td>
<td>37.5%</td>
</tr>
<tr>
<td>Intervention (n = 6)</td>
<td>50%</td>
<td>16.7%</td>
</tr>
<tr>
<td>Total (n = 14)</td>
<td>57.1%</td>
<td>28.6%</td>
</tr>
</tbody>
</table>
Another issue that was raised during a data collection was a report of sexual abuse. Because of the sensitivity of the questions being asked, there was the potential for disclosure of abuse. A participant reported to the research assistant that she had sex with a man after she said no. Since the participant was underage and the research assistant was a mandatory reporter, the research assistant legally reported the abuse to ChildLine. Childline is the 24-hour toll free telephone reporting system operated by the Department of Public Welfare to receive reports of suspected child abuse. The data collection was not completed that day and was completed later.

Due to frequent absences, the research assistants had to go to the school almost every day until all data collections assigned for that week were completed. Both research assistants reported that the days the participants were there, they did not have difficulty obtaining the data. Sometimes the students would refuse for a period during the day (if they were in a class or with friends that they liked), but completed the data collection later in the day. No one refused to the point that the research assistants had to leave and try another day. Also, with support from school staff, participants did not have barriers to completing the data collections. Teachers would allow them to receive credit or have an extension on in-class assignments if they did not finish before leaving for the sessions.

**Intervention.** Intervention feasibility data included retention rates, weekly participation records and barriers and facilitators involved in providing the intervention as recorded in field notes. The intervention group retention rate was 50% at DC2 and 16.7% at DC3. Attrition was due placement in juvenile detention and the participants running away from home. As previously mentioned, two participants in the intervention group voluntarily withdrew (i.e., one before session two and one before session four) and their data was not used in any of the mentioned analyses. There data was not used as per the research consent form it was determined
if participants withdrew from the study their data would not be used in any analyses. The students who withdrew reported that they were experiencing treatment overdose as they were assigned to multiple counselors throughout the week at school and at home. For the three students who completed the intervention, it took on average 9 ($SD = 1.73$) weeks to complete all eight sessions. Instead of the planned eight weeks to complete the intervention, one student completed it in 11 weeks due to being detained in the middle of the intervention.

Regarding study implementation, three students completed all eight sessions, with one student having to have sessions seven and eight done on the same day due to academic time constraints. On average, six sessions were completed with the participants. Similarly to the data collections, some students would ask if they could be seen later in the day. When that occurred they would attend the sessions later that day. At no time did the students who remained in the study completely refuse to attend the intervention session for that day. Likewise for the data collections, frequent absences required the interventionist to be available daily at the school.

**Motivational Interviewing intervention integrity.** After the eight week intervention was complete, the research assistant reviewed the interventionist’s note forms and used the intervention integrity checklist to assess if the intervention was implemented with integrity. Review of the data shows that the intervention was implemented with 98.09% integrity. For five of the six participants, every session was implemented with 100% integrity. One participant’s overall session integrity was at 88.54%. This participant refused to do the same two activities in every session. The activities were to identify a behavior she wanted to work on and complete the decisional balance worksheet. Despite that, she always created a goal pertaining to the session topic. This led to her actually identifying an area where she would like to have a behavior
change. However, because the steps were not completed per protocol, it was counted against the intervention integrity.

Acceptability

Three participants who completed the intervention were individually asked 12 acceptability questions created by the Primary Researcher within a week following their last session by the research assistants. The comments were substantially positive and indicated a “buy-in” from the participants. A detailed questions and response table is included in Appendix E.

Participants were asked what they liked about the intervention and what they would change. When asked what they liked about the intervention, the students replied that they did in fact like it, but really emphasized the relationship they had with the interventionist and how the interventionist interacted with them.

“She [interventionist] was there to help you talk, she guided me to make me want to change but you did it yourself.”

“The girl [interventionist] was kind of your friend and helped you talk about stuff.”

Only one participant stated what she would change about the intervention and it was her behavior relating to her goals. She said:

“I would do all the goals that we made.”

Students found it easy to engage in and be a part of the intervention. They felt accepted by the interventionist and found it easy to talk with her. One participant expressed that she just wanted to be a part of the study. The following responses were given when asked what made the intervention easy.
“It was easy talking to her [interventionist]; she was nice, because she helped me with my goals.”

“Just wanting to do it and be a part of it.”

“She didn’t get mad about what I say and she wanted to help with problems.”

When asked what was difficult about the intervention, two participants stated that there was no difficulty in participating in it. One stated the most difficult aspect was completing her goals. She said the following:

“My goals, what I was used to doing, they were hard to want to do at first, because it's what I was used to doing for so long.”

Two students stated they did not know what they would change in the intervention or that there was nothing to change. One student said:

“More time, more sessions, 10 more minutes in each session.”

Two of the participants stated there was nothing they would like less of in the intervention. One participant did comment on the interventionist’s level of talking. She commented:

“She [interventionist] talked too much- like she talked a lot. Maybe she just really likes it or something, but she's nice.”

All three students felt the intervention was helpful and that it changed some of their behaviors and feelings towards risky activities. The students’ responses to if they found the intervention helpful were:

“Yea, because she [interventionist] helped me do all the goals that me and her made.”

“Yeah because I changed from daily routines to what I do now, because of this intervention.”
“Yea, I don’t know why. Well you can talk about stuff.”

In response to the question, “Has your thoughts about sex or your sexual behaviors changed; if so, how?” The students said:

“Yea, because I don’t do everything, no more. I don’t know.”

“No, because we always talked about me having one partner and it hasn’t changed from the beginning.”

“Yes, I don’t have sex.”

Similarly, their responses to the question, “Has your thoughts about substance use or substance use behavior changed; if so, how?” were similar to the question about sexual thoughts and activities. The participants reported:

“Yea, because I don’t smoke or drink a lot no more.”

“Yeah because when I first started I used to smoke (cigarettes and marijuana) now I don’t.”

“Nope, I don’t ever do stuff like that.”

Of the three students, two did not believe that their thoughts about and behavior towards school changed. One replied that it did. She stated:

“Yeah because I always took school serious but when I started meeting with her I started coming to school more because I realized school was really important.”

Students overwhelming accepted the intervention. All three participants stated they would recommend the intervention to their friends. The participants were asked a question specifically relating to the characteristics of the interventionist. This question was asked to assess if the MI approach (i.e., person-centered, genuine, empathic, warm, and autonomous) was
accepted by the participants. The following comments were in response to the question, “If this were to happen again, what characteristics should the counselor have?”

“The same way as that lady [interventionist].”

“To want to help me, not judging when I tell them how I really feel about the situation.”

“Be nice and not make fun of people for what they say, like that girl [interventionist] didn’t.”

**Threats to Validity**

**Internal Validity**

As mentioned in the methods section, there identified proposed threats to internal validity. Because of the small sample size and low retention rates, this had many threats to internal validity. First, the two groups (i.e., control and experimental) could not be compared. With the absence of the control group, any effects found cannot be fully claimed to be the result of the intervention. Due to the retention rates, the sample size became extremely small thus lowering the statistical power of the study.

It is hypothesized that some of the scores on the tools at each of the data collections may have been affected by maturation. The participants appeared to quickly answer all items (25-35 minutes), which was much quicker than anticipated. This raises concern to the reliability of their responses. However, Cronbach alpha scores were high enough to indicate that not only are the tools reliable but that students responses were consistent. Because this study was conducted in less than three months, it is hypothesized that there were limited maturation effects of the entire study. Students’ attitude towards substance use, sex, and academic engagement, may not have changed drastically within three months compared to their age.
Both interventionist and participant effects could have affected the internal validity of this study. As mentioned earlier, the Primary Investigator served as the interventionist thus the interventionist may have had biases and diverged from the intervention protocol. However, with the results from the treatment integrity checklist, it was supported that the intervention was implemented objectively. The participants knew what behaviors were being measured at each data collection thus their responses during the intervention may have been influenced. However, participants in the intervention appeared to not be influence as their engagement in these behaviors ranged as indicated in their conversations during the intervention. Also, participants were reminded that in both the data collections and intervention sessions that any information that was shared would remain confidential unless there was a threat to safety of self or others, abuse, and neglect.

Lastly, since all participants were enrolled in the same school they could have been communicating during the study about the intervention and questionnaires. Thus, a threat to internal validity occurred as the shared information could have negated or positively changed intervention effects.

**Missing data.** This study had minimal missing data thus there was minimal negative effects on the internal validity of the study. A total of four scales had missing data which included a total of 26 missing items over all data collections. At DC1 (baseline), one participant did not complete an entire subscale on the Sexual Activity Self-Efficacy assessment. For the Student Opinion Survey, there was a pattern for missing data. All questions pertaining to homework completion were not answered by one student at DC1 (baseline), two students at DC2, and one student at DC3. The student who did not answer these at all three data collections reported she would not answer the information because she does not get homework thus it is not
applicable to her. This same student did not answer the one question pertaining to homework on the Children’s Self-Efficacy scale at DC2 and DC3. Lastly, on the CARE-R Expected Risks a student missed one question. Mean computation was used when less than 20% of the data in a scale was missing. For scales missing more than 20% of the data, the scale was not calculated.

**External Validity**

As proposed, the current study has minimal generalizability to populations other than adolescent females enrolled in alternative schools. Due to the complexity of serving adolescent females in this setting such as placement in detention centers, frequent truancy, and the participants’ running away, the adjustments that had to be made may not have to be made when working in other settings and with other participants. However, the results of this study can be applicable to settings and students with similar profiles.
Chapter V: Discussion

The risks associated with drug and alcohol use (e.g., morbidity and mortality; CDC, 2014) as well as those associated with sexual activity (e.g., pregnancy and STI’s; Martin et al., 2013; Myers et al., 2008), highlight the need for providing adolescents with the tools and skills to refrain from engaging in risky activity. Although some schools provide sex education as a way to dissuade risky behaviors, the CDC (2014) found that 85.8% of the adolescent females between 9th and 12th grade had acquired some formal sex education, yet over half still engaged in unprotected sexual activity. Similarly, many schools utilize drug resistance programs such as D.A.R.E. that have been shown to be ineffective (West & O’Neal, 2004). Thus, exposure to educational programming alone is not sufficient to decrease these risky behaviors.

Schools are an ideal setting to provide interventions to adolescents. First, it is the location where they are required to spend majority of their time during the week. Thus, when there are barriers (e.g., lack of transportation) to accessing health and behavioral health care, schools provide easy access. Schools are staffed by qualified personnel (e.g., school psychologists, social workers, nurses and counselors) who are trained in child health and behavioral health care. Further, these personnel are able to appreciate the impact risky acts (e.g., substance use and sexual behaviors) have on academic successes (Heilbrunn, 2007).

Motivational Interviewing (MI) is a counseling approach that is reported in the literature to drive behavior change for those engaged in risky behavior such as substance use (Kelly & Lapworth, 2006; Spirito et al., 2004), sexual activity (Chen et al., 2011; Naar-King et al., 2006), and academic disengagement (Strait et al., 2012; Terry et al., 2013). In the current study, the usefulness of MI was considered for adolescent females who were at risk for or engaged in substance use and sexual activity, and were academically disengaged. More specifically, the
purpose of this study was to examine the relationships among self-efficacy and outcome expectancy of academic engagement, substance use, and sexual activity. Also examined were the feasibility, acceptability, and effectiveness of the eight week MI intervention in a school setting.

**Relationships of Variables at Baseline**

The dependent variables in this study were self-efficacy and outcome expectancy of sexual activity, substance use, and academic engagement. Researchers have found that substance use and academic disengagement are positively correlated (Henry & Thornberry, 2010). Also, sexual activity is positively related to both academic disengagement (Jiang et al., 2013; Metzler et al., 1992) and substance use (Floyd & Latimer, 2010; Hipwell et al., 2012; van Gelder, et al., 2011). The first research question examined if the dependent variables were related at baseline, before the research groups (i.e., intervention and control) were created for the delivery of the MI intervention. Although it was expected that the current sample of females would show a similar correlations to those presented in previous studies, not all of these variables were related for these participants. However, it is important to note that self-reported perceptions of how adolescents think they might act were examined rather than the actual behaviors that were examined in other studies. For example, self-reported, sexual activity refusal self-efficacy (e.g., the belief that one could refuse sexual activity should one wanted to) was examined instead of sexual behavior. As such, a direct comparison between the beliefs of these youth and the behaviors shown in the other research should be considered with caution. Results showing that the dependent variables were unrelated were surprising given the high numbers of risky behaviors reported by all of the participants in the study.
The current study recruited 14 adolescent females from an alternative high school in a Mid-Atlantic city. Of the adolescents enrolled in the study, 64.3% were African American, 14.3% were Caucasian, and 21.4% were Bi-Racial. All participants were between the ages of 15 and 16 years old and attended either the 9th or 10th grade. The adolescent females in this study showed risky behaviors that were higher than national rates for females between 9th and 12th grade (CDC, 2014). The national rate for adolescent females, between 9th and 12th grade, who have tried alcohol is reported as 67.9% compared to 85.7% of the females reporting alcohol use in the current study. Unlike the national rate of 39.2% of adolescent females trying marijuana, about 85.7% of the females in this study reported trying marijuana. Similarly, for some illicit drugs (i.e., 7% cocaine, 14% ecstasy, and 28% prescription drugs) this sample reported rates higher than the national report of adolescent females, that were 4.5% cocaine, 5.5% ecstasy, and 17.2% prescription drugs not prescribed to them (CDC, 2014). In contrast, unlike the females in the national survey who reported using inhalants (10%), heroin (1.5%), or methamphetamine (3.0%; CDC, 2014), none of the females in the current study reported to have used those drugs. For the females in the study, they reported sexual intercourse rates that were double that of the national sample; where 100% females in this study reported engaging in sexual intercourse as compared to 46.0% of adolescent females in the national sample.

Similar to the participants in Enea and Dafinoiu (2009) study, the participants in the study showed low academic progress. Six of the study’s adolescent females (42.9%) reported being retained (i.e., held back from matriculating to the next grade) at least once. Their class grades in core subjects were very low with averages at 68.2% for math (\(Mdn = 62\%), percentage range: 34-100), 73.62% for English (\(Mdn = 78\%), percentage range: 35-93), and 86.23% for writing (\(Mdn = 89\%), percentage range: 65-96). That is, grades, on average, were primarily
below Bs. Additionally, these participants indicated poor attendance records where they showed an 82.1% attendance rate for the school year, this is compared to the national daily attendance average (as percent of enrollment) at 91.1% for high school students (Snyder & Dillow, 2013). Overall, the adolescents in this sample were more engaged in risky acts (i.e., sexual activity and substance use) than the national sample (CDC, 2014) and were academically low.

**Family and School Connectedness**

Originally this study proposed to control for student reported perceptions of school and family connectedness, however, due to an unacceptable level of attrition there were too few participants to run the statistical analyses. Yet, because at the outset of data collection (i.e., baseline) school and family connectedness were collected for all females, it was possible to consider their correlations with each dependent variable (i.e., substance use and sexual activity self-efficacy, and academic engagement self-efficacy and outcome expectancy). Results showed that when analyzing specifically the perception of school connectedness and family connectedness with each other, that students who perceived a connection with their teachers also perceived connectedness to their school. Given that teacher relationships are a critical factor for a positive school environment, it is expected that these variables would be related.

For completeness, even though the attrition rate prohibits the use of family and school connectedness as control variables, the correlations between connectedness scales and substance use, sexual activity, and academic engagement self-efficacy and outcome expectancy scales were examined. Results indicated that school connectedness (i.e., School, Teachers, and Peers Connectedness) and family connectedness (i.e., Parents and Siblings Connectedness) were related to three of the dependent variables (i.e., substance use and sexual activity self-efficacy, and academic engagement self-efficacy and outcome expectancy). One of the specific school
connectedness scales (i.e., Teacher Connectedness) was negatively related to a sexual self-efficacy scale (i.e., Condom Use). This contradicts previous research, which found that students with high levels of school connectedness were less likely to engage in risky sexual acts (Lonczak et al., 2002; Slap et al., 2003). Further, this unique correlation may simply be an artifact that is unexplained by the variables considered here; conceptually there is no explanation presented in the literature that would connect teacher connectedness and the belief that one can use a condom when they want to use one. Interestingly while teacher and school connectedness were related (i.e., significant positive correlation) the negative correlation found between teacher connectedness and condom use self-efficacy was not replicated with school connectedness and condom use self-efficacy. That is, school connectedness and condom use self-efficacy were not found to be related.

The lack of correlations found between perceiving a connection with one’s family and school with sexual activity and substance use self-efficacy was inconsistent with previous research. For example, previously substance use was negatively correlated to family (Anderson & Henry, 1994) and school connectedness (Li et al., 2011). Henry and colleagues (2003) validated those findings in their work showing family cohesion had an indirect relationship with substance use.

Family connectedness was related to academic engagement outcome expectancy when it was sibling specific. That is, there was a positive correlation between feeling connected to siblings and believing that academically engaging in school will lead to desired outcomes. There was also a positive correlation between feeling connected to siblings and believing that academically engaging in the academic subject, English, will lead to desired outcomes. Baker and colleagues (2001) and Pomerantz and colleagues (2011) had similar findings, however, these
studies considered general family connectedness as compared to specific sibling connectedness. One explanation may be that students who have siblings with whom they feel connected with and that attend the same school may in fact positively influence the student’s perception of school. The current study did not collect detailed data pertaining to participants’ siblings’ age or their school feelings and behavior as such it is unclear if this interpretation is appropriate for this sample. There were no relationships found with parent connectedness and academics in this sample.

**Substance Use**

Previous research indicated that substance use was positively related to sexual activity (CDC, 2014; Floyd & Latimer, 2010; Poulin & Graham, 2001; van Gelder et al., 2011) and negatively related to academic engagement (Heilbrunn, 2007; Henry & Thornberry, 2010). In the current study, however, the belief that one can resist drugs when they want to was not related to any variable (i.e., sexual activity self-efficacy, and academic engagement self-efficacy and outcome expectancy). These results were not consistent with the research previously mentioned. Unfortunately, outcome expectancy for substance use was unable to be analyzed in the current study due to variability in the scoring procedures that was not standardized. That is, although scoring variation is allowed by the authors of the instruments it was deemed inappropriate to consider scores that varied in terms of their meaning across participants. Therefore, the relationships between substance use outcome expectancy and the other variables were not examined.

**Sexual Activity**

A positive relationship between the belief that one can question their partner about sexual behaviors and the belief that one can refuse sexual intercourse when they want was found.
Conceptually, this relationship makes sense whereas having the belief to be able to refuse sexual intercourse can be perceived as taking ownership of one’s own sexual behaviors, and thus, may be related to having confidence to discuss safe sexual practices with a partner. Similar to the limitations described in substance use outcome expectancy sexual activity outcome expectancy was unable to be analyzed in the current study. As such, the relationships between substance use outcome expectancy and the other variables were not examined.

**Academic Engagement**

There were four statistically significant relationships between academic self-efficacy and academic outcome expectancy domains. Overall school outcome expectancy was positively correlated with the belief of successfully engaging in activities that lead to academic success, the belief that one can engage in self-regulated learning, and lastly, the belief that engaging in science related academic tasks will lead to a desired outcome. Because overall school outcome expectancy measures an individual’s basic approach to academic engagement (outcome expectancy), it would be anticipated that an individual’s general approach to academic engagement would be positively related to each or some of the other academic skills as well as believing in one’s self-regulated learning and academic achievement. It is promising to find the positive correlations in general attitudes toward learning and effort this low achieving sample. In the current sample, however, we did not find that an overall school outcome expectancy was related to math or English outcome expectancy. This sample did show that the belief that engaging in science related tasks would lead to a desired outcome was also positively correlated with the belief that engaging in science related tasks would lead to a desired outcome; however, the importance of that finding is unclear.
In this sample, there were no relationships found between sexual activity and substance use self-efficacy with any academic variables (e.g., academic engagement self-efficacy and academic outcome expectancy). Although these findings are inconsistent with other studies (Jiang et al., 2013; Metzler et al., 1992) it may be understandable given the very low academic success (e.g., retention rates and grades described above) shown in the sample. That is, personal efforts in one life domain (e.g., sexual activity or substance use) may not also affect other life efforts or success (i.e., academic efforts or outcomes). Research in this area is sparse where results are often compared to grades rather than related to self-reported beliefs (e.g., academic self-efficacy and outcome expectancy).

**Motivational Intervention Effectiveness**

The second research question was to examine the effectiveness of the school-based MI intervention. Due the sample size, power, and inability to run a statistical comparison between groups, the quantitative results need to be interpreted with caution. Also, the visual analysis interpretation from all three data collections for the intervention participant and control participants should be interpreted qualitatively and with caution. Overall, the non-parametric statistical analysis results indicated that the MI intervention did not significantly change the participants’ self-efficacy and outcome expectancy scores between data collection one (DC1; baseline) and data collection two (DC2). Similarly, there were no significant differences between self-efficacy and outcome expectancy scores between DC1 (baseline) and DC2 for the control group. Visual analysis of these data also supported the conclusion that there were no differences between DC1 (baseline) and DC2 for either group. Patterns in the data for the control group did not visually differ from the intervention group. This suggests that there were no changes, statistically or clinically, for those participants exposed to the intervention.
Pertaining to data collection three (DC3) data, again due to small sample size, a statistical analysis was not conducted. A modified single subject analysis was conducted for the intervention participant and a visual analysis was conducted for the control participants. The intervention participant had data collected at DC1 (baseline) and two post intervention data collections (DC2 and DC3). For the intervention participant, there was an improvement in drug use resistance (two non-overlapping data points after baseline). Since only two data points were collected, that indicates 100% of the data were trending in a positive direction. Although this was a low number, this does indicate more certainty that there was a positive effect for the one intervention participant. It is important to note that three intervention data points are the preferred standard for indicating a measurable change in behaviors, but some researchers suggest a more flexible trend and view three data points as a suggestion and not a requirement (Richards et al., 1999). Unfortunately, due to scheduling we were not able to get a third follow-up data point for this intervention participant. For condom use self-efficacy, for the intervention participant, results showed only a decrease between data points after baseline indicating either no effect or a potential negative effect of the MI intervention.

The MI intervention had no effects on academic engagement self-efficacy (Self-Regulated Learning & Academic Achievement), academic engagement outcome expectancy (Math Attitude and General Attitude) and sexual self-efficacy related to the belief that the participant could question her partner’s sexual behaviors and refuse sex when she want to do either. Data showed an initial decreased after baseline then an increased past baseline scores (one non-overlapping data point [50%]) at DC3. Similarly, for science outcome expectancy and English outcome expectancy, the data showed both an increase followed by a decrease. In other words, some data showed a positive effect while others showed a negative effect and therefore,
there really was no sustained change following the baseline. However, there can be no
certainties stated about the impact of the MI intervention as it was one intervention participant’s
data, which did not fully meet criteria for a single subject design. Of course, none of these
conclusions can be generalized nor can there be any statements about intervention effects.

The control group data shows no discernable trend patterns in any of the variables measured. Each graph indicated varying patterns for all control group participants from DC1 (baseline) to DC2 and DC2 to DC3 (i.e., decrease-increase, increase-decrease, increase-increase, and decrease-decrease). All of the visual analysis data for the control group cannot be interpreted with certainty as no formal rate of improvement, trend data, effect size or statistical analyses were conducted.

**Feasibility and Acceptability**

The final research question focused on the feasibility and acceptability of the eight week school-based MI intervention. Unlike several of the MI studies previously conducted where participants were at hospitals, emergency departments, college campus, or traditional high schools (Audrain-McGovern et al., 2011; Dermen & Thomas, 2011; Kelly & Lapworth, 2006; Mason et al, 2011; Spirito et al., 2004), this study was implemented in an alternative high school with adolescent females who were at-risk for or engaged in substance use and sexual activity, and were academically disengaged. Due to the novelty of this intervention, it was necessary to examine the feasibility and acceptability of a school-based MI intervention.

**Feasibility**

Results showed that the feasibility of this study was variable for both the research and intervention components. That is, the individual components for both the research and intervention aspects were easily implemented when students were accessible and when there was
support from school staff. Difficulties related to recruitment, retention, and timelines were evident.

**Research.** Results showed that study was easy to implement when students attended. However, the replicated the entire research procedures would be difficult. There were many challenges in the recruitment and retention of participants. Although this alternative school had 33 females who were considered eligible for participation in the study, only 24 (72.7% of those referred) of the females were ultimately approached to be in the study. Of those 33 females eligible, nine were unreachable because of poor attendance, absence due to medical reasons, or were suspended for discipline reasons past the time line for recruitment. Of the 24 students approached, six (25%) students did not enroll due to lack of interest in the study or parental written permission to enroll was not obtained. Many students lacked ongoing contact with their parents/legal guardians. Of those eligible for the study (33) and those approached to be in the study (24), only 16 females (48.5% of those referred, 66.6% of those approached) were initially enrolled. It was evident that recruitment could have been easier if the study began earlier in the academic year; thus, leaving a longer recruitment window. To increase enrollment, allowing for oral or written consent rather than only written consent may increase enrollment for those parents who felt their verbal call was sufficient and they were unable to follow-up with documentation.

Accommodating for the school’s academic calendar was a barrier. Although meeting during the school day was easy to accomplish, the demands of data collection were too inflexible. First, the timeframe to complete the data collections had to be adjusted from the original study proposal because the rolling recruitment ran into the school’s scheduled spring break; the timeframe to complete the study had to be modified by adding an extra week. Also, a few of the participants had multiple absences causing the timeframe to extend beyond the
academic year. Ultimately, DC3 was changed from three weeks to just less than three weeks. In order to manage the potential negative effect inconsistent time periods between data collections - when students were absent -- research assistants would go to the school daily until all data collections assigned for that week were completed. As such, this became a time management challenge with the academic year coming to a close. Similar to the recruitment recommendations, this could have been avoided if the study began earlier in the academic year. When implementing an eight week intervention, interventionists and researchers should be aware of the academic calendar and plan for flexibility in their schedules as students’ may have multiple absences for a variety of reasons.

The feasibility was increased with support and “buy-in” from the school staff. School personnel allowed students to modify their time in class and collection of class assignments so that the participants were able to complete all data collection/s. School staff clearly valued the students efforts at improving other life stresses that they felt were interfering with classroom productivity. Thus, it became clear that school support is essential for successfully implementing a study like the current one. If the researcher or interventionist is not a part of the school’s core staff, it is important for them to find ways to integrate themselves with the staff and build rapport with the staff in order for them to access extra support if needed.

All but one participant completed data collections within a half an hour on average. The single participant who needed extra time requested that the data packets were read to her as allowed in the research protocol. For her, the data collections lasted approximately an hour on average. Despite the time it took for all participants to complete the data packets, it was evident that data collection took less than one academic period and consequently, being feasible to complete during the average school day.
Retention of the participants was remarkably low at each data collection point for both the intervention and control groups. At DC2 only five of the control group participants and three intervention group participants completed the data packets; this was down from eight and six, respectively. Retention decreased at DC3, where only three control group participants and one intervention group participant were available for data collection. Kelly and Lapworth (2006) had similar issues with sample size and attrition. Due to the complexity of these adolescents’ lives, and the time demands and obligations of the various organizations that serve them, some of the participants withdrew or were lost. Attrition was primarily caused by the participants’ report of medical concerns – note the details of personal medical records were not collected, excused and unexcused absences, and placement in detention facilities. It is possible that coordination with other service providers, such as detention facilities, would have facilitated data collection. That is, because an alternative school like this also provides information about adolescents’ academic needs, coordinating around the intervention may have been possible.

Finally, when considering the feasibility of implementing this study or one like it, planning for how to address sensitive topics with a minor must be emphasized. For example, although sexual abuse was not a variable neither considered nor discussed during any portion of this study, there was one adolescent who disclosed an abuse history. As such the steps for such a discloser, as described in the permission and consent forms were completed. Although the procedures were followed without incident, it is critical to point out the importance of close supervision (e.g., ensuring good communication between the researcher, supervisors and the school) and ensuring all involved are clear on the limitations of confidentiality and the requirements for mandatory reporting. In order to be successful with studies about adolescent sexual activity and substance use, researchers need to be well-prepared in this area.
**Intervention.** As reported in the research section, low retention rates negatively impacted the feasibility of delivering the intervention. However, when participants were able to attend the interventions there was a clear interest such that at no time did any participant refuse to attend the intervention session for that day. Likewise for the data collection, frequent absences required the ongoing adjustment to the time frame; however, there was no refusal to complete data collection when it was possible. So similarly to the research procedures, feasibility was overall low.

As mentioned, some of the participants stated that they were receiving a variety of counseling services in addition to the MI intervention in this study. This only negatively impacted two adolescents who ultimately withdrew from the study indicating too much contact around their problems. Given the totality of services provided, it is likely that communication between service providers or coordination of service delivery hours between school- and non-school-based services would allow for a more palatable schedule.

For MI to be effective, the interventionist has to have adequate training in MI (Hettema et al., 2005). Despite the current interventionist being well-versed and -trained in MI, it may be possible that the techniques used to address resistance was not adequate. It was noteworthy that the student did not want to complete the same two tasks throughout the intervention as required. In the end it was possible to complete only one of the tasks designed to wrap up each session; the decision balance sheet was not used as intended in the MI protocol. As such, the modifications made to accommodate the participant’s resistance led to unequal implementation of the MI protocol, which is noted in the integrity rate of 88.54% for that specific student whereas there was an overall implementation integrity of 98.09% was recorded for all participants.
Lower integrity rates have been noted in less experienced interventionists, which has led McGovern and colleagues (2011) to advise that proficiency in delivering MI is essential. These authors also suggest intensive training may be needed to effectively implement the intervention with integrity. The need for intensive training can negatively affect the opportunity and feasibility of implementation of MI. The time and cost to obtain MI training may exceed reasonable budgetary restrictions for any treatment team or school staff. The draw to manualized treatment may quickly overtake the need for more MI training with only a few interventionists. However, even with the noted difficulty in one participant, intervention integrity was a strength of this study. It is evident that for most students, it was easy to get through all components. Moreover, for a student who was resistant, it was necessary for the interventionist to reframe the task in a way that was not as direct.

**Acceptability**

The participant responses regarding the acceptability of the intervention were overwhelmingly positive. Two participants stated that the intervention was helpful because the interventionist was easy to talk to and trust. Specifically, they valued having non-judgmental support and guidance when creating sensitive goals. They felt unjudged and that they were able to create goals based on what they felt was appropriate versus the typical experience of being told what to do. The adolescents appreciated the intervention as it allowed them to discuss their risky behaviors in a safe environment. The participants liked the intervention as a whole, but emphasized the importance of the relationship they had with the interventionist.

Even though quantitative results did not indicate any changes in the participants’ self-efficacy levels, anecdotally the participants reported believed that some of their thoughts and behaviors regarding risky behavior did change. Specifically, two students believed their sexual
behaviors decreased in frequency and the single participant who did not report a perception of change said it was because she was with the same partner throughout the study where a change was unnecessary. Similar self-perceived changes were noted for substance use, where two participants reported a decrease in their use while one stated there was no change because she was not engaged in substance use at all at the time of the study. Unfortunately, only one student felt her behavior towards school had improved where she indicated that she attended school more often than before the study.

Like the results of Yeagley and colleagues (2012) study, this study’s results indicated that the intervention was acceptable to the females. All three participants, who completed the acceptability questionnaire immediately following DC2, found the study helpful and stated they would recommend the intervention to their friends. These results are promising for other researchers considering the use of MI with adolescent females who are engaged in multiple risk behaviors; this is a notoriously difficult group of adolescents to engage in behavior change even when evidence-based interventions are applied (Jackson, Henderson, Frank, & Haw, 2012). Again, due to the small sample, acceptability results should even be interpreted with caution; it is likely that the opinions of those who stayed in the study may have a positive bias towards the study.

**Limitations**

As indicated in previous research, MI’s effectiveness is variable (Burke et al., 2003; Dunn et al., 2001; Hettema et al., 2005). Several of the issues and limitations that were found in previous studies were similar to those noted in the current study including sample size (Kelly & Lapworth, 2006) and the interventionist MI proficiency level (McGovern et al, 2011). Although the MI intervention components were able to be implemented as planned, there were many
limitations to this study. Attrition rates were unacceptably high results in an inadequately small sample size, time constraints caused an almost on-going reworking of the scheduled sessions, the unstandardized scoring procedure of the instruments complicated interpretation of results – note that these variations in scoring were not well documented in the previous literature and as such were unknown when planning for the measurement variables – incomplete analyses, and an inability to generalize findings resulted in spotty measurements that provide very limited information. Similarly, this list clearly threatens the internal and external validity considerations and leaves much of the results uninterpretable. It is difficult to really assess the reliability of the MI effectiveness results.

Given the above constraints as well as the reality that this was the first time the study was conducted in a school setting, considerations about the feasibility and acceptability of the intervention ultimately became the primary issue to be considered in this project. Time constraints affected the implementation of the study and required the planned data collection schedule to be modified. Due to the school year ending, DC3 had to be moved from three weeks to two weeks for some of the participants. The time constraint led to the combination of session seven and eight for one participant in order to successfully finish the intervention.

Another limitation was related to the instruments used to measure self-efficacy and outcome expectancy. This current study was limited in instrument options where self-efficacy and outcome expectancy are narrow beliefs thought to precede specific behaviors. Unfortunately, psychometrically sound instruments that measure specific sexual activity, substance use, and academic engagement self-efficacy and outcome expectancy are limited. Therefore, the tools may not have been the appropriate self-efficacy and outcome expectancy tools.
Despite the multiple measures used, the intervention effects may not have been found with these tools. Since all of the tools were self-reports about sensitive information, the participants may have been reluctant to respond truthfully. However, self-efficacy has to be measured by self-reports as it is an internal construct that cannot be measured by a third party objective rater. The participants stated that they felt as if their behaviors had changed but the measures did not indicate any change over time. Again, this could be due to small sample size limiting the power of the study thus any effects that did occur could not be detected. Otherwise, stated as, there was an increased chance of a Type II error occurring. That is, there is a likelihood that the no effects were found when there actually were intervention effects. Lastly, due to scoring issues, not all variables were analyzed as proposed. The CARE-R was not scored which left this study without two of the main dependent variables (i.e., substance use and sexual activity outcome expectancy).

Finally, the current study had several methodological limitations. As mentioned, the sample size limited the ability to compare the intervention and control group statistically. The analysis that was originally proposed could not be used because of the small sample size. The visual analysis presented for the intervention participant who made it through all three data collections could not be analyzed statistically, thus it cannot be certain what effects actually occurred for this participant. Because there was not a statistical comparison with the control group to compare effects and the small sample size, it cannot be stated with certainty the study’s effectiveness. As mentioned previously, the sample size drastically affects the ability to say if the MI intervention was effective. Also, the generalizability of the study is limited. There is minimal generalizability due to study site being a specialized urban school for adolescents with problem behaviors.
Implications for Future Research

The results from this current study provide several implications for future researchers who are trying to better understand and serve students with high needs. Future researchers should further assess the feasibility of providing an eight week school-based MI intervention to students in alternative school settings. Although the acceptability results were promising, one suggested modification would be to add an educational component so that the intervention would better meet the environment and students’ needs. For the school context, there is a clear need to further refine the content of the intervention. Even though MI is designed to be brief, this intervention was longer than typical. The intervention was designed to be longer as each subsection (i.e., academic, sexual activity, and substance use) was only two sessions each. However, it was proposed that these variables were related but the current study does not support that assumption. Therefore, it is proposed that the relationship between these variables be further examined. Likewise, the need to address all variables, together, needs to be considered.

Another way to identify if the variable groupings in this study are appropriate is by conducting a mixed-method design. The qualitative portion of the mixed-methods design could identify if students perceive these variables as pertinent in their lives, and if they are relevant for the students. Qualitative findings could inform the content discussed in sessions that are aimed at addressing specific student needs rather than simply applying an intervention protocol without adjustment for the individual. Many interventions are designed for and examined in settings other than alternative settings, where highly at-risk groups are combined in non-homogenous groups, as such, the effectiveness for students in alternative settings is unknown.

Future researchers should examine the effectiveness of the current intervention through a randomized controlled trial once feasibility is established. The intervention may be better suited
for a more traditional school setting, where adolescents show fewer and less intense risks which may clarify questions around MI’s generalizability. There also needs to be more research on how much training is really needed for effective implementation of MI.

The push for implementing evidence-based interventions in schools showcase the importance of identifying interventions that can be effectively implemented in alternative school settings. An additional area of future research should focus on providing effective interventions in alternative settings where students’ attendance is variable. Future research should focus on identifying or creating interventions that allow for flexibility in implementation since this is a group of students known to be transient (Brown, 2007). Researchers could also consider how to integrate the MI intervention into an established psychoeducational programing. Although, MI is a practical tool and has good literature support, the usefulness for specific school populations needs to be better explored. Further, when to use MI alone, when it should be combined with other school supports and intervention strategies needs to be examined.

Lastly, psychometrically sound measures of self-efficacy and outcome expectancy should be identified and examined for their usefulness (i.e., reliability and validity). The current study lacked instruments of self-efficacy and outcome expectancy that were of the same behavior (i.e., condom use self-efficacy and condom use outcome expectancy). Because of this and from the student reports of perceived behavior change in the acceptability questions, actual intervention effects may not have been detected.

**Conclusion**

Adolescence is a challenging developmental period marked by various internal and external changes in adolescents’ body and in their lives (Silbereisen & Kracke, 1997; World Health Organization, 2010). It is documented that there are some adolescents who engage in
high-risk behaviors such as sexual activity, substance use and, often underappreciated, academic disengagement. Although it is evident that the risk behavior of the current adolescent female sample is highly skewed and they are all placed in an alternative setting rather than in their home districts, this does not mean that these youth are so divergent from the norm that they should not receive good treatments aimed at impacting their negative life course trajectory.

Service providers can refer to Alfred Bandura’s Social Cognitive Theory (SCT; Bandura, 1986) as a resource in understanding the causes, and opportunities for change, in adolescent behavior. Theoretically, adolescent behavior is explained by the triadic reciprocal relationship that consists of the triangulation between behaviors, personal factors, and environments. For adolescents, all three factors are tightly interrelated and by intervening on one of the factors it can affect the others. This study was set to focus primarily on the personal factors self-efficacy and outcome expectancy. This was preferred because it is an internal factor that can be influenced by intervening with just the student, thus bypassing the need and the difficulty of intervening with the environments and changing behaviors in a short time period. The results showed that self-efficacy and outcome expectancy scores did not change with an intervention designed to address that specific factor alone. However, due to the inclusive results, there is minimal evidence to support or dispute the SCT. The current data indicated that either the intervention needs to be multilayered and address two or three factors together or that there has to be a multitude of interventions that align with one another and that address each factor individual.

The current intervention did not address environmental or behavioral needs. At-risk adolescents, especially those whose social and emotional development is delayed by disorder or poorly enriched environments might require access to basic psychoeducational information
around goal setting and how to persist when faced with challenges. That is, before a school team pursues the option of using an intervention like MI – where identifying and using self-motivations to promote behavior change is primary – it is essential that the school team can ensure the youth has a foundation that goal can be built upon. These at-risk females struggled with managing their complex lives (i.e., family, criminal, financial, social, and emotional problems) and showed very real deficiencies in adequate skill development needed for goal identification and setting.

Adolescents attending alternative schools are constantly required to manage a variety of obligations and be flexible to extreme changes in environment and routine. This presents a challenge to providing tradition models of intensive therapies, interventions, and services as the students are constantly moving in and out of the alternative school due to truancy, detention and running away. Despite the need for intervention in addition to MI, this study supports the need to find more flexible therapies that mold to these students lives. If not, schools are inefficiently using resources as the interventions are not being implemented as designed and therefore, are likely to be ineffective.

The major focus of research and practice should be on the services that schools provide to students prior to placement in an alternative setting. There are a variety of risk factors (e.g., academic disengagement, low school performance) that can be identified prior to students engaging in delinquent acts. Schools need to have designed systems in place to identify those risk factors and take preventative approaches to helping students at-risk. Tiered services in traditional settings, that may include interventions like the present one, should be further examined.
Finally, it is important to consider the lessons learned from this study that may prove to be useful for school-based professionals in designing and providing MI interventions to adolescent females in alternative settings. First, it became essential to consider the nature of the population at hand. Students in alternative settings bring along the challenge of keeping them engaged. Students, who are in alternative settings, evidence particularly complex treatment needs, often receive a variety of services, and have to comply with a variety of agencies demands. Many students attending alternative schools are at-risk for running away from home and school and many more are detained due to violations of their probation (i.e., positive urine samples, skipping school, and running away). Students who were enrolled at this school due to court order had many other services like, but not limited to, anger management, family counseling, and weekly probation check-ins. These services were not in communication with each other so adding another service, the MI intervention, caused the students to be overwhelmed and over-treated for similar issues. These services lacked a basic orientation to considering continuity of care.

Second, when considering the challenges this difficult to treat group presents for school and community professionals, the implementation outcomes results showed that MI is an effective way to communicate with youth who are adjudicated; MI assisted in creating a trusting and non-threatening therapeutic relationship in an environment where it is typically difficult to establish. MI elicited change talk, a positive indicator in the MI process, in the adolescents and helped them identify motivations to change. All the adolescents in the intervention group developed their own behavior goals after discussing their self-efficacy and their desired outcomes.
Despite some positives outcomes relating to feasibility and acceptability, MI alone may not be the solution. The students in the intervention presented with treatment needs beyond motivation to change. In relation to the triadic relationship, interventions designed to create change in personal factors of adolescents with complex lives should be multifaceted and include positive changes to their environments and include reinforcement of positive choices around risk behavior.
References


Appendix A

Session 1
Introduction and Assessment

☐ Start Time: ________
☐ Explain the Intervention
☐ Value Card Sort
  1. _____________________________________________________________
  2. _____________________________________________________________
  3. _____________________________________________________________

☐ Introduction Notes
  ☐ Substance Use
    _____________________________________________________________
    _____________________________________________________________
    _____________________________________________________________

  ☐ Sexual Activity
    _____________________________________________________________
    _____________________________________________________________
    _____________________________________________________________

  ☐ Academic Engagement
    _____________________________________________________________
    _____________________________________________________________
    _____________________________________________________________

☐ My Life Chart

☐ Self-Identified Behavior Change
    _____________________________________________________________

☐ Decisional Balance Worksheet

☐ New Goal
    _____________________________________________________________
    _____________________________________________________________

☐ Ruler
☐ Closing
☐ End Time: ________
Session 2
Substance Use

☐ Start Time: ________

☐ Goal Assessment and Status
  ☐ Where you able to achieve your goal?
    _____________________________________________________________
    _____________________________________________________________
    _____________________________________________________________

  ☐ What made it hard (easy)?
    _____________________________________________________________
    _____________________________________________________________
    _____________________________________________________________

  ☐ What did the outcome (success) look like?
    _____________________________________________________________
    _____________________________________________________________
    _____________________________________________________________

☐ My Life Chart

☐ Self-Identified Behavior Change
  _____________________________________________________________

☐ Decisional Balance Worksheet

☐ New Goal
  _____________________________________________________________

☐ Ruler

☐ Closing

☐ End Time: ________
Session 3
Substance Use

☐ Start Time: ________

☐ Goal Assessment and Status
  ☐ Where you able to achieve your goal?
    __________________________________________________________
    __________________________________________________________
    __________________________________________________________

  ☐ What made it hard (easy)?
    __________________________________________________________
    __________________________________________________________
    __________________________________________________________

  ☐ What did the outcome (success) look like?
    __________________________________________________________
    __________________________________________________________
    __________________________________________________________

☐ My Life Chart

☐ Self-Identified Behavior Change
  __________________________________________________________

☐ Decisional Balance Worksheet

☐ New Goal
  __________________________________________________________
  __________________________________________________________

☐ Ruler

☐ Closing

☐ End Time: ________
Session 4
Sexual Activity

☐ Start Time: ________

☐ Goal Assessment and Status
   ☐ Where you able to achieve your goal?
     __________________________________________
     __________________________________________
     __________________________________________

   ☐ What made it hard (easy)?
     __________________________________________
     __________________________________________
     __________________________________________

   ☐ What did the outcome (success) look like?
     __________________________________________
     __________________________________________
     __________________________________________

☐ My Life Chart

☐ Self-Identified Behavior Change
   __________________________________________

☐ Decisional Balance Worksheet

☐ New Goal
   __________________________________________
   __________________________________________

☐ Ruler

☐ Closing

☐ End Time: ________
Session 5
Sexual Activity

☐ Start Time: ________

☐ Goal Assessment and Status
  ☐ Where you able to achieve your goal?
    ___________________________________________________________
    ___________________________________________________________
    ___________________________________________________________

  ☐ What made it hard (easy)?
    ___________________________________________________________
    ___________________________________________________________
    ___________________________________________________________

  ☐ What did the outcome (success) look like?
    ___________________________________________________________
    ___________________________________________________________
    ___________________________________________________________

☐ My Life Chart

☐ Self-Identified Behavior Change
    ___________________________________________________________

☐ Decisional Balance Worksheet

☐ New Goal
    ___________________________________________________________
    ___________________________________________________________

☐ Ruler

☐ Closing

☐ End Time: ________
Session 6
Academic Engagement

☐ Start Time: ________

☐ Goal Assessment and Status
  ☐ Where you able to achieve your goal?
    __________________________________________________________
    __________________________________________________________
    __________________________________________________________

  ☐ What made it hard (easy)?
    __________________________________________________________
    __________________________________________________________
    __________________________________________________________

  ☐ What did the outcome (success) look like?
    __________________________________________________________
    __________________________________________________________
    __________________________________________________________

☐ My Life Chart

☐ Self-Identified Behavior Change
  __________________________________________________________

☐ Decisional Balance Worksheet

☐ New Goal
  __________________________________________________________
  __________________________________________________________

☐ Ruler

☐ Closing

☐ End Time: ________
Session 7
Academic Engagement

☐ Start Time: ________

☐ Goal Assessment and Status
  ☐ Where you able to achieve your goal?
    __________________________________________________________________
    __________________________________________________________________
    __________________________________________________________________

  ☐ What made it hard (easy)?
    __________________________________________________________________
    __________________________________________________________________
    __________________________________________________________________

  ☐ What did the outcome (success) look like?
    __________________________________________________________________
    __________________________________________________________________
    __________________________________________________________________

☐ My Life Chart

☐ Self-Identified Behavior Change

☐ Decisional Balance Worksheet

☐ New Goal

☐ Ruler

☐ Closing

☐ End Time: ________
Session 8
Closing

☐ Start Time: ________

☐ Goal Assessment and Status
  ☐ Where you able to achieve your goal?
    __________________________________________________________
    __________________________________________________________
    __________________________________________________________

  ☐ What made it hard (easy)?
    __________________________________________________________
    __________________________________________________________
    __________________________________________________________

  ☐ What did the outcome (success) look like?
    __________________________________________________________
    __________________________________________________________
    __________________________________________________________

☐ Review Previous Goals and Topics

☐ My Life Chart

☐ New Goal
    __________________________________________________________
    __________________________________________________________
    __________________________________________________________

☐ Ruler

☐ Closing

☐ End Time: ________
Appendix B

Session Fidelity

Session 1
☐ Start Time: ________  
☐ Explain the Intervention  
☐ Value Card Sort  
☐ Introduction Notes  
  ☐ Substance Use  
  ☐ Sexual Activity  
  ☐ Academic Engagement  
☐ My Life Chart  
☐ Self-Identified Behavior Change  
☐ Decisional Balance Worksheet  
☐ New Goal  
☐ Ruler  
☐ Closing  
☐ End Time: ________

Session 2
☐ Start Time: ________  
☐ Goal Assessment and Status  
  ☐ Where you able to achieve your goal?  
  ☐ What made it hard (easy)?  
  ☐ What did the outcome (success) look like?  
☐ My Life Chart  
☐ Self-Identified Behavior Change  
☐ Decisional Balance Worksheet  
☐ New Goal  
☐ Ruler  
☐ Closing  
☐ End Time: ________

Session 3
☐ Start Time: ________  
☐ Goal Assessment and Status  
  ☐ Where you able to achieve your goal?  
  ☐ What made it hard (easy)?  
  ☐ What did the outcome (success) look like?  
☐ My Life Chart  
☐ Self-Identified Behavior Change  
☐ Decisional Balance Worksheet
☐ New Goal
☐ Ruler
☐ Closing
☐ End Time: _______

Session 4
☐ Start Time: _______
☐ Goal Assessment and Status
  ☐ Where you able to achieve your goal?
  ☐ What made it hard (easy)?
  ☐ What did the outcome (success) look like?
☐ My Life Chart
☐ Self-Identified Behavior Change
☐ Decisional Balance Worksheet
☐ New Goal
☐ Ruler
☐ Closing
☐ End Time: _______

Session 5
☐ Start Time: _______
☐ Goal Assessment and Status
  ☐ Where you able to achieve your goal?
  ☐ What made it hard (easy)?
  ☐ What did the outcome (success) look like?
☐ My Life Chart
☐ Self-Identified Behavior Change
☐ Decisional Balance Worksheet
☐ New Goal
☐ Ruler
☐ Closing
☐ End Time: _______

Session 6
☐ Start Time: _______
☐ Goal Assessment and Status
  ☐ Where you able to achieve your goal?
  ☐ What made it hard (easy)?
  ☐ What did the outcome (success) look like?
☐ My Life Chart
☐ Self-Identified Behavior Change
☐ Decisional Balance Worksheet
☐ New Goal
☐ Ruler
☐ Closing
☐ End Time: _______

Session 7
☐ Start Time: ________
☐ Goal Assessment and Status
  ☐ Where you able to achieve your goal?
  ☐ What made it hard (easy)?
  ☐ What did the outcome (success) look like?
☐ My Life Chart
☐ Self-Identified Behavior Change
☐ Decisional Balance Worksheet
☐ New Goal
☐ Ruler
☐ Closing
☐ End Time: ______

Session 8
☐ Start Time: ________
☐ Goal Assessment and Status
  ☐ Where you able to achieve your goal?
  ☐ What made it hard (easy)?
  ☐ What did the outcome (success) look like?
☐ Review Previous Goals and Topics
☐ My Life Chart
☐ New Goal
☐ Ruler
☐ Closing
☐ End Time: ______
Appendix C

Sports  Social Media

Shopping  Music

Hobbies  Family

Friends  College

School  Work

Partying  Boyfriend/Girlfriend
### Appendix E

#### Acceptability Questions and Participants’ Responses

<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>What did you like about the intervention?</td>
<td>1. I liked a little bit, not a lot. I don’t know what though. 2. She was there to help you talk, she guided me to make me want to change but you did it yourself. 3. The girl was kind of your friend and helped you talk about stuff.</td>
</tr>
<tr>
<td>What would you change?</td>
<td>1. I would do all the goals that we made. 2. Nothing. 3. I don’t know.</td>
</tr>
<tr>
<td>What made the intervention easy?</td>
<td>1. It was easy talking to her, she was nice because she helped me with my goals. 2. Just wanting to do it and be a part of it. 3. She didn’t get mad about what I say and she wanted to help with problems.</td>
</tr>
<tr>
<td>What made the intervention difficult?</td>
<td>1. Nothing. 2. My goals, what I was used to doing, they were hard to want to do at first, because it’s what I was used to doing for so long. 3. It wasn’t difficult.</td>
</tr>
<tr>
<td>What would you like more of?</td>
<td>1. Nothing. 2. More time, more sessions, 10 more minutes in each session. 3. I don’t know.</td>
</tr>
</tbody>
</table>
### Acceptability Questions and Participants’ Responses Continued

<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>What would you like less of?</td>
<td>1. Nothing.                                                                klärer: 2. Nothing.                                                                klärer: 3. She talked too much- like she talked a lot. Maybe she just really likes it or something, but she’s nice.</td>
</tr>
<tr>
<td>Did you find this intervention helpful? Why or why not?</td>
<td>1. Yea, because she helped me do all the goals that me and her made.</td>
</tr>
<tr>
<td></td>
<td>2. Yeah because I changed from daily routines to what I do now, because of this intervention.</td>
</tr>
<tr>
<td></td>
<td>3. Yea, I don’t know why. Well you can talk about stuff.</td>
</tr>
<tr>
<td>Do you think your thoughts about sex or your sexual behaviors changed? If so, how?</td>
<td>1. Yea, because I don’t do everything, no more. I don’t know.</td>
</tr>
<tr>
<td></td>
<td>2. No, because we always talked about me having one partner and it hasn’t changed from the beginning.</td>
</tr>
<tr>
<td></td>
<td>3. Yes, I don’t have sex.</td>
</tr>
<tr>
<td>Do you think your thoughts about drugs or alcohol, or your drug or alcohol behaviors changed? If so, how?</td>
<td>1. Yea, because I don’t smoke or drink a lot no more.</td>
</tr>
<tr>
<td></td>
<td>2. Yeah because when I first started I used to smoke (cigarettes and marijuana) now I don’t.</td>
</tr>
<tr>
<td></td>
<td>3. Nope, I don’t ever do stuff like that.</td>
</tr>
<tr>
<td>Do you think your thoughts about school or your school behaviors change? If so, how?</td>
<td>1. No.</td>
</tr>
<tr>
<td></td>
<td>2. Yeah because I always took school serious but when I started meeting with her I started coming to school more because I realized school was really important.</td>
</tr>
<tr>
<td></td>
<td>3. No.</td>
</tr>
<tr>
<td>Question</td>
<td>Response</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Would you recommend this intervention to friend?</td>
<td>1. Yea.</td>
</tr>
<tr>
<td></td>
<td>2. Yes.</td>
</tr>
<tr>
<td></td>
<td>3. Yea, it was alright.</td>
</tr>
<tr>
<td>If another counselor were to do this, what characteristics would be important for them to have?</td>
<td>1. The same way as that lady.</td>
</tr>
<tr>
<td></td>
<td>2. To want to help me, not judging when I tell them how I really feel about the situation.</td>
</tr>
<tr>
<td></td>
<td>3. Be nice and not make fun of people for what they say, like that girl didn’t.</td>
</tr>
</tbody>
</table>