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Differences in Socialization Factors in Relation to Prescription Drug Misuse Between Rural and  
Urban Juveniles

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A thesis  
presented to  
the faculty of the Department of Criminal Justice and Criminology  
East Tennessee State University

In partial fulfillment  
of the requirements for the degree  
Master of Arts in Criminal Justice and Criminology

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by  
Gabriela Smith  
December 2019

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Keywords: Prescription Drug Misuse, Social Factors, Rural, Urban, Juveniles

## ABSTRACT

Socialization Factors in Relation to Prescription Drug Misuse Between Rural and Urban

Juveniles,

by

Gabriela Smith

Juvenile misuse of prescription drugs in the United States has continuously increased over the last few decades, especially within rural regions of the country. Despite continuous increase in rates of misuse, limited research exists on elements of socialization that may function to prevent drug use. The current study utilized the Monitoring the Future Survey data to explore prescription drug misuse between different populations of juveniles. While using Hirschi's (1969) theory of social bonds as a theoretical framework, different elements of socialization were explored to determine whether they work to contribute or prevent prescription drug misuse among rural and urban juveniles. Results indicated that parental attachment served as the most substantial protective factor among both populations of juveniles. Additionally, socialization differed in relation to prescription drug use among rural and urban youth. These findings could be implicated in future anti-drug programs that specifically target different regions of the country.

## ACKNOWLEDGEMENTS

I am fortunate to have so many people to thank for the support in my years as a graduate student. First and foremost, I would like to thank my sweet Johnny. Thank you for always believing in me, and loving me when I needed it most. You are a wonderful husband and my very best friend. To my mom, thank you for always pushing me to be my best. You are the strongest woman I know, and I hope I have made you proud. Aunt Vera and Uncle Jerry, you guys have gone above and beyond for me and I am so thankful to have you.

To my thesis chair Dr. Rush, I cannot thank you enough for everything you have done for me. I am so grateful for your guidance and continuous support throughout this process. You are a wonderful person and mentor. To Dr. Pealer, thanks for always pushing me past my comfort zone. I am a much better student and leader because of the lessons you have taught me in the past few years. Dr. Osborne, thank you for listening to my every dilemma. I am so grateful for all of your encouragement and support. To Dr. Edwards, I would not be here if it were not for you. Thank you so much for believing in me as a student, and never holding back on your advice. Finally, thank you Christine for being a listening ear during the tough times, and a smiling face during the good. You all have done so much more for me than you can ever imagine.

Lastly, I want to thank my friends and fellow classmates. Logan, Eaven, Rychelle, Andrew, and Hannah, thank you for making my time in graduate school so memorable. Some of the best times of my life were with you guys. To Sydney and Ashley, thank you for endless love and support these last two years (and the billion years before that). You are the best friends anyone could ever ask for.

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## CHAPTER 1

### INTRODUCTION

Over the last several decades, the United States has witnessed an increase in the rate of non-medical prescription drug use within the population (Substance Abuse and Mental Health Services Administration, 2018). According to the 2017 National Survey on Drug Use and Health, approximately 2 million Americans misused prescription pain relievers for the very first time in that year. An additional one million misused stimulants, 1.5 million misused tranquilizers, and 217,000 misused sedatives for the first time in 2017 alone (Centers for Behavioral Health Statistics and Quality, 2018). The abuse of these substances has resulted in exacerbating rates of overdose deaths, with death tolls amounting to over 70,000 in 2017 (Centers for Disease and Control Prevention, 2018).

Opioids (also known as painkillers) have been reported as the most commonly misused category of medically prescribed drugs (Drug Enforcement Administration, 2018; Substance Abuse and Mental Health Services Administration, 2018). When used properly, these drugs serve the purpose of severe pain management. A common form of opioid misuse is self-medication, where one aims to alleviate pain by consuming these painkillers without direct medical order. Ultimately, their addictive properties can result in dependency, or even death if taken without professional direction (Schepis & Kirshnan-Sarin, 2008).

Stimulants (also known as amphetamines), tranquilizers, and sedatives have also been identified as categories of commonly abused medications (Substance Abuse and Mental Health Services Administration, 2018). Stimulants have been medically prescribed for the treatment of mental illnesses such as attention-deficit/hyperactivity disorder (ADHD), or irregular sleep conditions. Stimulants have been commonly misused for the enhancement of mental



performance without medication recommendation. These drugs, however, are addictive and can result in cardiovascular failure or psychosis (McCabe, Boyd, & Teter, 2009). Tranquilizers and sedatives serve the purpose of medicinally treating anxiety and sleep disorders. Counter to stimulants, tranquilizers and sedatives work to slow brain activity and provide a feeling of therapeutic calmness. These drugs also obtain addictive properties. When used improperly, or in conjunction with other substances, they can also result in fatality (McCabe et al., 2009).

Several factors have been attributed to this surge in prescription drug misuse, including over-prescription, diversion of unused drugs, and the addictive components that were once denied by drug producers (Jones et al., 2018). Although this epidemic has negatively affected all age groups within the U.S., misuse of prescription medications is at its highest among adolescents and young adults (Substance Abuse and Mental Health Services Administration, 2018). After marijuana, the non-medical consumption of prescription drugs was reportedly the most frequently abused substance within adolescents ages 12-17 since 2012 (Johnston et al., 2018).

Moreover, a number of recent studies have observed that juveniles, under 18 years of age, who reside in rural areas of the United State are at a significantly higher risk of becoming prescription drug misusers than their urban counterparts (Ford, 2009; Havens, Young, & Havens, 2011; Monnat & Rigg, 2016; Pettigrew, Miller-Day, Krieger, & Hecht, 2012; Pruitt, 2009; Rhew, Hawkins, & Oesterle, 2011; Young, Havens, & Leukefeld, 2012). Despite these findings, little is known about the origins of this issue among juvenile populations. Previous research has been able to link factors that may be related to higher rates of prescription drug misuse in rural adults (Keyes et al., 2014; Leukefeld, Walker, Havens, Leedham, & Tolbert, 2007; Wunsch, Nakamoto, Behonick, & Massello, 2009). Still yet, this issue remains understudied within rural

adolescents. Understanding how protective factors differ among youth in different regions of the United States is essential in the development of effective policies and programs for drug prevention (Wunsch et al., 2009).

### **Current Study**

In light of this concern, the purpose of this study was to conduct further investigation on different elements of socialization within rural settings, which may be related to preventing prescription drug misuse in rural juveniles. This study was unique in using the Monitoring the Future Survey as its data source to assess this relationship. This survey has been administered annually across schools within the United States since 1975. It serves the purpose of analyzing trends in substance abuse, delinquency, attitudes, and beliefs of juveniles nationwide.

Information gathered from this survey has been utilized in providing policymakers with information regarding juvenile behavior as it has changed throughout the decades. To date, this data set has not been utilized in the assessment of prescription drug misuse within rural and urban settings.

In addition to using the Monitoring the Future Survey, this thesis applied Hirschi's (1969) theory of social bonds by examining how parental attachment, involvement in recreational activities, commitment to school, and religiosity differ between rural and urban juveniles in relation to prescription drug misuse. Previous studies have explored how these elements of socialization work to prevent different types of juvenile delinquency (Ford, 2009; Hoeve, Stams, van der Put, Dubas, & van der Laan, 2012; Johnson, Jang, Larson, & Li, 2001; Payne, 2008; Shears, Edwards, & Stanley, 2006 ); however, how these elements of socialization differ between rural and urban regions remains understudied. Understanding the impact of protective

social factors within different communal settings can work to provide anti-drug use programs with knowledge of what aspects of socialization to target through their efforts.

The primary research question proposed within this study was: *how does prescription drug use differ among urban and rural youth?* Using the 2015 Monitoring the Future Survey data, the evaluation of this question sought to provide a current and nationally representative understanding of the differences among prescription drug use between adolescents from rural as compared to urban America. In addition, secondary research questions were presented within this study. These questions sought to explore how *attachment to parents, conventional activities, commitment to academics, and religiosity* were related to prescription drug misuse within rural and urban adolescent populations. These four variables were derived from Hirschi's (1969) theory of social bonds, which suggested that these elements of socialization had a protective effect against delinquency.

In the current study, simple frequencies were calculated to analyze how prescription drug misuse varied between the rural and urban samples of juveniles. In an effort to address the four secondary research questions, three logistic regression models were computed. Model 1 provided an overview of how attachment to parents, conventional activities, commitment to academics, and religiosity related to prescription drug misuse. Models 2 included only the rural sample in this comparison, and Model 3 included only the urban sample. The results of these models were then compared in order to determine how elements of socialization differed between rural and urban youth.

Results of the primary research question further substantiated previous findings concerning discrepancies in prescription drug misuse between rural and urban juveniles (Ford, 2009; Havens et al., 2011; Monnat & Rigg, 2016; Pettigrew, Miller-Day, Krieger, & Hecht,

2012; Pruitt, 2009; Rhew, Hawkins, & Oesterle, 2011; Young, Havens, & Leukefeld, 2012). It was revealed that in the nationally representative sample of juveniles derived from the Monitoring the Future Survey, rural adolescents claimed higher rates of misuse than urban adolescents. This may be a product of unique factors found exclusively within rural areas that potentially contribute to increased rates of misuse, including the culture, population characteristics, and economy (Keyes et al., 2014).

Further, results of the secondary research questions revealed that parental attachment acted as the strongest protective factor against misuse in both regions. Following Hirschi's (1969) theory, these results suggest that a strong parental bond may work to deter criminal behavior, such as the illicit consumption of prescriptions. When assessing involvement in conventional activities, it appeared that this element significantly increased the likelihood of misuse within the urban sample. This finding could be attributed to involvement in unstructured and unsupervised recreation (Lilly, Cullen, & Ball, 2015), which was not directly measured within this study. In the rural sample, it appeared that juveniles who were more strongly committed to academics were at higher odds of misusing pharmaceuticals. Lack of funding for education within rural America may result in stress among students (Havens, Young, & Havens, 2011), resulting in prescription drug misuse for mental enhancement (DeSantis, Webb, & Noar, 2008). Finally, religiosity had no significant effect on either sample of juveniles. Hirschi (1969) stated that the social bond element of belief only deterred criminality if the action went against the moral guidelines of the juvenile. Since prescription drugs are technically legal substances, religiosity may not be a strong element of socialization to deter misuse of pharmaceuticals. In rural America, church attendance may also be an indicator of tradition and not morality.

The policy implications associated with this study were threefold. First, strengthening parental bonds may be an effective method of preventing prescription drug misuse within juvenile populations. Second, providing schools in rural America with improved resources for academic achievement may lower rates of misuse related to academic stressors. Finally, using tailored approaches based on region of the country to prevent prescription drug misuse may yield more effective results.

### **Chapter Summary**

An annual report published by the Drug Enforcement Administration (2018) revealed that prescription drug overdoses killed 116 American citizens daily in 2016 alone, and has remained the leading cause of death in the United States. Research has alluded to the fact that misuse is more prevalent in rural regions of the country (King, Fraser, Boikos, Richardson, & Harper, 2014; Modarai et al., 2013; Wunsch, Nakamoto, Behonick, & Massello, 2009; Y & Paulozzi, 2008), and juveniles in these regions are at higher risk for misuse than urban youth (Ford, 2009; Havens, Young, & Havens, 2011; Monnat & Rigg, 2016; Pettigrew, Miller-Day, Krieger, & Hecht, 2012; Pruitt, 2009; Rhew, Hawkins, & Oesterle, 2011; Young, Havens, & Leukefeld, 2012). Despite these findings, limited research has explored the discrepancy in misuse between the two populations of adolescents. Furthermore, factors attributed to misuse that occur socially lack exploration, which could potentially explain why socialization is not often targeted through anti-drug programs for juveniles (Botvin, 2000). This study sought to provide insight into what elements of socialization are worth utilizing in these programs, and how they differ between rural and urban populations of juveniles.

In the next chapter, a review of previous literature regarding drug use in the United States, origins of the opioid epidemic, differences in rural and urban drug use, and juvenile drug use were

addressed. Chapter Three provided an overview of the research questions, further information regarding the Monitoring the Future Survey, the methods and statistical plan of analysis utilized to conduct this study, and a discussion of study limitations. Chapter four presented the findings of the current study, and Chapter five sought to further explain the findings while presenting potential policy implications, and future directions for research.

## CHAPTER 2

### REVIEW OF LITURATURE

Since the mid-1990s, the United States criminal justice system has focused much of its attention on fighting substance abuse in the general population. The political movement known as the “war on drugs” encouraged stricter punishments and punitive legal approaches when handling drug crimes. Judges and law enforcement officers alike were instructed to restrict the utilization of discretion in order to incapacitate as many drug offenders as possible. Specifically, this movement aimed to remove street drugs such as crack cocaine, and the violent crime involved with this epidemic, from disadvantaged areas of the United States (Travis & Edwards, 2015). Despite legal and political efforts to target substance abuse, the United States has continued to see an increase in overall drug use throughout the twenty-first century (Substance Abuse and Mental Health Services Administration, 2018).

Over the last few decades, the U.S. has experienced tremendous loss from prescription drug misuse. According to the United States Drug Enforcement Administration (D.E.A.), (2018), drug poisoning is the current leading cause of death in our country. It has outnumbered motor vehicle crashes as well as homicides every year since 2011. Marijuana has consistely been found to be the most heavily used illegal substance in the United States (Drug Enforcement Administration, 2018; Substance Abuse and Mental Health Services Administration, 2018). An increase in this particular drug may be due to shifting public perspectives associated with marijuana risk (Johnston et al., 2018). As several states have legalized medical as well as recreational use of marijuana, perceptions regarding the risks that follow the use of this drug have decreased nation-wide (Azofeifa et al., 2016). Availability for heroin, fentanyl, methemphatamine, and cocaine was found to be threatning to the general public in 2018 by the

Drug Enforcement Administration. The mixing of fentanyl, a synthetic opioid that has often used for pain management of cancer patients, with other illegal substances has resulted in a deadly epidemic now faced by the U.S. (Drug Enforcement Administration, 2018).

The most habitually abused substances to date, second only to marijuana, are prescription medications. In 2017, the U.S. Government declared the widespread misuse of prescription medication as an “epidemic” (Jones et al., 2018). In that same year, the National Survey on Drug Use and Health (2018) reported that approximately 6 million Americans claimed to have misused some form of prescription drugs in the past twelve months. When nationally measuring the misuse of prescription medications, the Substance Abuse and Mental Health Services Administration found that approximately 3.1 million individuals age 12 to 25 tried some form of prescription drug recreationally for the first time in 2017 (Substance Abuse and Mental Health Services Administration, 2018). This public health concern continues to affect all areas of the United States. However, studies have shown that rural areas have seen the adverse effects of non-medical prescription drug use (N.M.P.D.U.) at higher rates than urban areas (King, Fraser, Boikos, Richardson, & Harper, 2014; Modarai et al., 2013; Wunsch, Nakamoto, Behonick, & Massello, 2009; Y & Paulozzi, 2008). Just as in the adult populations, juveniles in rural areas have also experienced higher rates of prescription drug misuse than their urban counterparts (Ford, 2009; Havens, Young, & Havens, 2011; Monnat & Rigg, 2016; Pettigrew, Miller-Day, Krieger, & Hecht, 2012; Pruitt, 2009; Rhew, Hawkins, & Oesterle, 2011; Serdar & Spencer, 2002; Young, Havens, & Leukefeld, 2012).

By using measures found in the 2015 Monitoring the Future Survey, this study aimed to take a closer look at the differences between N.M.P.D.U. in adolescents from rural areas compared to those who reside in urban areas of the United States. Additionally, questionnaire



results were drawn from the Monitoring the Future Survey and assessed in order to measure how the protective factors of attachment, involvement, commitment, and belief, as defined by Hirschi's theory of social bonds (1969), could potentially affect restraining NMPDU throughout rural adolescent populations in comparison to urban areas. Implications of this study could provide policy makers with insight into factors that prevent rural adolescents from falling prey to the prescription-drug epidemic. In this chapter, the escalation of the prescription drug epidemic, as well as differences within the adult population concerning NMPDU, were discussed. Next, recent trends regarding juvenile substance abuse, and how this abuse differs between rural and urban populations were further explained. Finally, Hirschi's (1969) theory of Social Bonds was discussed to understand the theoretical framework utilized within this study. The purpose of this chapter was to explain the background of the NMPDU epidemic that has plagued juveniles in rural areas in the United States and to connect the theoretical framework behind Hirschi's social bond theory to the research in question while exploring previous research on the topic at hand.

### **Non-Medical Prescription Drug Use in the United States**

Following the increase in the use of prescription medications as a means of long-term pain-management, the United States has experienced a continuous increase in the fatal use of these substances for purposes other than medical treatment. In 2017, approximately 70,000 individuals lost their lives due to drug overdose. This calculation was a 9.6% increase in deaths compared to the year prior (Centers for Disease and Control Prevention, 2018). Over time, the misuse of prescription drugs has elevated from a legal issue to a public health concern, and more recently a national epidemic (Jones et al., 2018; Drug Enforcement Administration, 2018). The origins of this crisis and the potential factors that have contributed to its current state will be further discussed in this section.

The popularity of opioids grew in the late 1980s after the World Health Organization introduced it as a means of pain management for postoperative and cancer patients (Jones et al., 2018). These drugs were advertised as long-term or short-term solutions to pain management without the risk of addiction. In 1995, the American Pain Society developed a new campaign, which aimed to standardize the way in which medical professionals dealt with pain management. This campaign was known as the “pain as the fifth vital sign” movement, and it included instructions for doctors on how to assess a patient’s level of pain and provide them with comfort through prescription painkillers after all other options were exhausted (Jones et al., 2018). Federal regulation developed by the Joint Commission mandated that medical professionals exhausted all options for pain management, even in acute injuries or hospitalizations that did not require surgery (Paulozzi, 2012). Because of this, hospitals were held responsible for thoroughly treating any patient who complained of pain and were given permission to utilize prescription opioids as a resource, providing they had met patient satisfaction.

As a result, doctors nation-wide began more liberally prescribing painkillers to patients in order to meet patient satisfactory goals. With greater public access to prescription drugs, abuse of these substances became more prevalent throughout the United States. Following these changes, the U.S. began experiencing higher rates of deaths related to drug overdose (Kolodny et al., 2015). It was not until 2007 that pharmaceutical companies were held responsible for the false marketing of opioids to the public. A significant contributor to the production of these drugs, known as Purdue Pharma, pleaded guilty to federal charges against them for branding their drug OxyContin as a non-addictive substance, which was later disproved (Jones et al., 2018).

Recreational prescription drug use in the United States changed after this period of overproduction and distribution of opioids. While the war on drugs worked on decreasing rates

of street drugs in the U.S. during the 1990s into the 2000s, prescription medication misuse was not targeted directly through drug control efforts (Kolodny et al., 2015). Despite widespread federal regulations on prescription drug monitoring, the epidemic has not subsided (Drug Enforcement Administration, 2018).

The D.E.A. reported in 2018 that the abuse of prescription medication was the leading cause of death in the United States. The two most commonly vended prescription painkillers in the United States for the past nine years have been hydrocodone and oxycodone, which have been used for treatment of pain management in cancer patients, post-operation pain management, or general chronic pain management (Drug Enforcement Administration, 2018). Since prescription painkillers are easily medically attainable, drug diversion, or the transfer of prescription medications from an individual with a prescription to another individual without a prescription for illegal use (Wood, 2015), has increased in the U.S. In fact, a majority of individuals who attain these drugs for illegal use claim to receive, buy, or steal them from a relative or a family member (Substance Abuse and Mental Health Services Administration, 2018).

In rural areas, the exchange and distribution of prescription medication for non-medical purposes has been continuously observed as more of a concern than in urban areas. (Behonick, & Massello, 2009; King, Fraser, Boikos, Richardson, & Harper, 2014; Wunsch, Nakamoto, Modarai, et al., 2013; Y & Paulozzi, 2008). These differences have been attributed to societal kinship, lack of stable economy, increased availability of prescription medications, and the out-migration of youth in rural America that is not found in urban areas of the U.S. (Keyes et al., 2014). The correlations between these geographical locations on how they differ in prescription drug misuse was further discussed in the next section.

## **Differences in Non-Medical Prescription Drug Use between Rural and Urban America**

Although rural criminology is a new and developing field, insight into drug use in rural America has yielded alarming results. Rural areas of the United States have been defined as “county or group of contiguous counties that contain at least one city of 50,000 inhabitants or more” (U.S. Census Bureau, 2012). These areas with lower population densities have experienced more damaging consequences due to the opioid epidemic than more densely populated areas in rates of use, drug diversion, and death (King, Fraser, Boikos, Richardson, & Harper, 2014; Modarai et al., 2013; Wunsch, Nakamoto, Behonick, & Massello, 2009; Y & Paulozzi, 2008). Research into this damaging epidemic in rural areas has shed some light on potential correlations of this problem. In this section, findings regarding differences between prescription drug use between rural and urban areas were discussed.

Four factors, as identified by Keyes, Cerda, Brady, Havens, and Galea (2014), have been attributed to the unique makeup of the prescription drug market found in rural America. The first of these factors is the increased availability of prescription medications. Although the opioid epidemic spread nation-wide since the 1990s, rural areas have continued to house more elderly citizens than urban areas (Glasgow, 2000). Chronic pain is a common hindrance faced among the elderly, which in turn results in bountiful prescriptions of pain-management medications (Hoffman, Meier, & Council, 2002). While demographics of illicit drug abuse include younger individuals, fatalities caused by prescription drug overdose are more commonly seen in older individuals (Wunsch, Nakamoto, Behonick, & Massello, 2009). Rural areas also house individuals who are more likely to participate in heavy manual labor and are eligible to receive medication for long-term care of work-related injuries (Keyes et al., 2014; Leukefeld, Walker, Havens, Leedham, & Tolbert, 2007). In a study by Hoffman, Meier, and Council (2002), 66% of

rural adults reported some form of chronic pain in comparison to only 50% of urban adults. This discrepancy may be a result of the higher rates of blue-collar workers in rural areas who receive less medical treatment and suffer more injuries than workers from urban areas.

The network of kinship that is found exclusively in rural America has been identified as the second factor unique to these areas that leads to the widespread misuse of prescription medication (Keyes et al., 2014). Cultural values that exist in rural areas tie relationships within communities and families differently than the cultural values found in urban America. Sociological research has found that it is more common for individuals in rural areas to include extended family members in their everyday social interactions. Neighbors in rural areas are more likely to know one another, have a greater sense of trust, and share similar ideals (Turcotte, 2005). Due to these close communal and family ties, drug diversion, or the transfer of prescription medications from an individual with a prescription to an individual without for illegal use (Wood, 2015), is seen more commonly in rural regions (Keyes et al., 2014). The Drug Enforcement Administration (2018) reported that misused prescription medication is most often obtained from friends or relatives. In a study of rural Appalachian counties, Leukefeld et al. (2007) found the sharing and trading of pills to be a common occurrence within families and friends. Some respondents even claimed that this was their source of income, which leads to the third factor, as discussed by Keyes et al. (2014) - economic stressors in rural America.

In order to get a better understanding of the economic status of rural America, Thiede, Lichter, and Slack (2018) analyzed rates of employment, common characteristics of low-income workers, and how the workforce in rural America compared to urban America. Their results demonstrated that citizens from rural areas were less likely to be employed. They were also more likely to live below the poverty lines, even with employment, than urban citizens. Level of

education was the only identified characteristic to differ between citizens below the poverty line in rural areas versus urban areas, with lower attainment of schooling and occupational training found in the rural areas (Thiede, Lichter, & Slack, 2018). The higher rates of abuse and diversion of prescription medication in rural areas may be interrelated with financial strain among these individuals (Diala, Muntaner, & Walrath, 2004; Keyes et al., 2014). Financial instability ultimately leads to the last factor identified by Keyes et al. (2014) - the out-migration of young adults.

Because of the lack of opportunity in education, employment, or social advancement found in rural areas, young adults become more likely to move to further developed urban areas of the United States once of age (Domina, 2009; Keyes et al., 2014). The out-migration of ambitious youth leaves behind a failing economic infrastructure, which adds to the financial stressors faced by rural citizens (Domina, 2009). As previously discussed, illicitly diverting prescribed medications may be used as a source of income for the youth who stay behind (Keyes et al., 2014). The exorbitant rates of illegal prescription drug diversions occurring in rural parts of the country have been linked to the massive population of elderly citizens in these areas. Since the elderly are often treated with painkillers for various types of chronic pain, rural towns have developed into an environment where these substances are more readily accessible (Hoffman, Meier, & Council, 2002). With a surplus supply of these substances, the illicit prescription drug market is more likely to be cultivated in rural America in comparison to U.S. urban communities. N.M.P.D.U. in the United States has continued to increase nationwide since the 1990s, (Substance Abuse and Mental Health Services Administration, 2018), causing deaths from poisoning through recreational use, and creating an illegal market for drug-trade that is unique to areas with a low population density.

This section served to explain the origins of the opioid epidemic in the United States, as well as to describe how societal kinship, lack of a stable economic infrastructure, increased availability of prescription medications, and the out-migration of youth in rural America has made prescription drug misuse more prominent in these rural parts of the country. Illicit drug use, including prescription drug misuse, is not an issue exclusive to the adult population. The following section described the most current trends of juvenile drug use in our country, along with some factors identified through prior research that may have had an effect on these trends, specifically in rural America as compared to urban America.

### **Adolescent Drug Use in the United States**

Substance abuse in the United States is an epidemic that has affected citizens of all ages. During the late 20th century, drug-prevention programs were developed in school-based settings in order to educate juveniles on the dangers and consequences of substance abuse. These programs, such as Drug Abuse Resistance Education (D.A.R.E.), have shown to be ineffective in preventing drug use (Botvin, 2000). In 2017, approximately one out of every four juveniles claimed to have used some form of illegal substance (Substance Abuse and Mental Health Services Administration, 2018). Substance abuse is especially damaging to the juvenile population. During adolescence, these individuals experience physical, social, and psychological growth that could be negatively affected by the abuse of illicit drugs. The current state of adolescent substance abuse rates was further discussed in this section.

Overall, juvenile illicit drug use experienced an increase in the United States in 2017 (Johnston et al., 2018). Since risky behaviors often manifest during adolescence, juveniles are more likely to experiment with illegal drugs (National Center for Children in Poverty, 2011).

Repeated experimentation, especially with addictive substances, could potentially lead to the development of a substance abuse disorder (Drug Enforcement Administration, 2018).

Similar to adult populations, the most common illegal substance abused by juveniles in 2017 was marijuana (Substance Abuse and Mental Health Services Administration, 2018). Around 6.5% of adolescents ages 12 to 17 claimed to be users of marijuana in that year, a trend that has continued to increase since the 1990s. The widespread use of this drug may be directly correlated with decreased public perceptions of risk, and the increased ease of availability as reported by juveniles nation-wide (Johnston et al., 2018). Although this drug remains illegal under federal law, several states have voted to pass legislation regarding the possession, use, and growth of marijuana. It has become more easily attainable and even consumed for medicinal purposes throughout the United States (Drug Enforcement Administration, 2018).

The D.E.A.'s 2018 annual threat assessment concluded that heroin, cocaine, and methamphetamine continue to remain a threat to the general population, including adolescents (Drug Enforcement Administration, 2018). Heroin use among juveniles has seen a slight decrease since 2009, while cocaine and methamphetamine use and availability has remained constant among all age groups (Drug Enforcement Administration, 2018; Johnston et al., 2018; Substance Abuse and Mental Health Services Administration, 2018).

The Drug Enforcement Administration's 2018 Annual Drug Threat Assessment stressed that the largest category of abused substances for juveniles and adults alike in 2017 second to marijuana was prescription medications, specifically pain relievers (Substance Abuse and Mental Health Services Administration, 2018). In 2017, approximately 484,000 juveniles had claimed illegal misuse of prescription medications, including pain relievers, tranquilizers, stimulants, or sedatives, with pain relievers being the most common type of medication misused, and sedatives



being the least common. Although these findings are conclusive of the United States, prescription drug misuse remains an overarching issue in rural America, as previously discussed in this chapter. While this study aimed to focus on differences between prescription medication misuse in rural and urban juveniles, overall differences between rural and urban juvenile drug use must also be discussed. The following section aimed to serve this purpose.

### **Differences in Adolescent Drug Use between Rural and Urban America**

Although researchers have previously focused on the urban juvenile drug problem for the last several decades, recent studies have shown alarming rates of substance abuse in rural juvenile populations (Ford, 2009; Havens, Young, & Havens, 2011; Monnat & Rigg, 2016; Pettigrew, Miller-Day, Krieger, & Hecht, 2012; Pruitt, 2009; Rhew, Hawkins, & Oesterle, 2011; Serdar & Spencer, 2002; Young, Havens, & Leukefeld, 2012). Just as urban and rural drug use differs in the adult population, rural adolescents experience drug use differently due to unique factors that compose the areas in which they reside. As previously discussed in this chapter, factors unique to rural areas provide an atmosphere that has been related to the increase in NMPDU and diversion of substances that differ from urban America. Previous findings within research regarding the differences between rural and urban adolescent drug use, specifically prescription drug misuse, were discussed in this section.

When comparing rates of substance abuse between rural and urban juveniles, Lambert, Gale, and Hartley (2008) concluded that not only do rural juveniles more frequently engage in substance abuse, but they are also more likely to engage in high-risk behavior such binge-drinking or driving under the influence. Rhew, Hawkins, and Oesterle (2011) found similar results while controlling for the different geographical domains of rural towns. The juveniles who resided in less populated areas were more likely to engage in substance abuse. Disparities

within prescription drug misuse in juvenile populations have shown that it is a significantly greater problem in non-metropolitan areas as compared to more urban areas (Pettigrew, Miller-Day, Krieger, & Hecht, 2012; Wunsch, Nakamoto, Behonick, & Massello, 2009; Young, Havens, & Leukefeld, 2012).

Rates of substance abuse found between urban and rural juveniles could be attributed to the existence of the cultural kinship found exclusively within rural communities, just as in the adult populations. When comparing rural and urban perspectives on the safety of their neighborhoods, Boggs (1971) found that rural citizens were more likely to handle matters personally rather than calling upon law enforcement. If a juvenile were to be caught using illegal substances by a community member that they were familiar with, those matters might be handled personally between that individual and the parents of the juvenile. Without legal intervention, some adolescents may continue to abuse drugs (Pruitt, 2009).

Community perceptions regarding substance abuse may also influence overall rates of drug use among rural juveniles. If a specific type of substance becomes socially tolerable in a rural area, the community may begin to view it as acceptable behavior (Gundy, 2006). Due to familiarity within rural communities, a consensus regarding a particular substance could be reached more easily than in an urban city (Keys et al., 2014). Additionally, Pettigrew, Miller-Day, Krieger, and Hecht (2012) discovered that parents in rural Appalachia were less concerned with their children dabbling in substance abuse than urban parents. Some rural parents even encouraged it and provided their children with illicit substances. Rural adolescents have been found to receive illicit substances from familiar acquaintances more often than urban juveniles, who are more likely to receive them from strangers (Pettigrew et al., 2012). These relationships built between residents of rural areas, whether they provided positive support or adverse impacts

for juveniles, could ultimately be the influencing factor that leads these adolescents to higher rates of drug use than urban juveniles.

Another attributing factor to rural juvenile drug use is the lack of community resources due to poverty within these areas (Diala, Muntaner, & Walrath, 2004). Without funding allocated for community pro-social activities, boredom could potentially lead juveniles to engage in risky anti-social behaviors (Rhew, Hawkins, Oesterle, 2011). Especially in areas where schools are unable to provide juveniles with supplemental recreational activities, experimentation with substance abuse may be a result of idle time (Pruitt, 2009). For instance, Mahoney and Stattin (2000) found that juveniles who were involved in structured activities were less likely to divulge in anti-social behaviors, regardless of gender. Similarly, Carlo, Crockett, Wilkinson, and Beal (2010) found that rural juveniles who were more involved in volunteerism and activism were less likely to engage in substance abuse. Rural juveniles in this study claimed higher rates of substance abuse in comparison to their urban counterparts. This may be due to the lack of conventional activities in their communities.

Additionally, the inability to provide proper education in rural schools may also be able to explain some of the differences between the prevalence of drug abuse by rural youth when compared to urban youth. Schools in rural areas may lack the monetary resources for providing their students with proper school equipment, quality educators, and extra-curricular opportunities, which could potentially lead to academic success (Shears, Edwards, & Stanley, 2006). Students who demonstrate concern for educational performance are less likely to divulge in substance abuse than those who do not (Payne, 2008). Since rural juveniles are less likely to achieve academically (Pruitt, 2009), rural schools with inadequate curriculums may fail to serve as a protective factor to those in non-metropolitan areas. Havens, Young, and Havens (2011)

found supporting results when assessing differences between rural and urban juvenile prescription drug use. Students in rural areas were not only more likely to abuse prescription medications; they were also less likely to shown concern about their academic achievements. The lack of commitment to conventional ideals, such as academic success, might be lacking in rural America due to the scarcity in funding for proper education.

Lastly, disparities between rural and urban juvenile drug use may be attributed to the lack of proper drug-prevention education in rural areas (Wunsch, Nakamoto, Behonick, & Massello, 2009). As a majority of in-school drug prevention programs aim to teach juveniles of the dangers of drug abuse, they may miss their mark on instilling these beliefs into rural adolescents before they become involved with drugs. Young, Havens, and Leukefeld (2012), found that rural juveniles begin experimenting with illegal substances at a much younger age than urban juveniles. Additionally, these programs tend to focus on substances common to urban settings and fail to provide education on drugs that are more prevalent in rural settings, such as opioids (Pruitt, 2009).

As indicated by the relative ineffectiveness of educational drug prevention programs on rural juvenile prescription drug misuse, a gap in literature remains between rural and urban disparities in the dynamic nature of substance abuse behaviors in adolescent populations. Understanding the differences between potential protective factors in urban versus rural parts of the country may be of assistance in advancing future efforts to minimize the rates of disturbance caused by the opioid epidemic. This section aimed to discuss factors regarding community, activities, education, and drug-prevention that have been previously used in attempt to explain why disparities within prescription drug misuse exist between areas of high and low population density. However, there remains a lack of research on factors that may prevent these juveniles

from falling prey to this epidemic. The following section serves to provide a theoretical perspective, which explores factors regarding restraint of delinquent behaviors. This framework was used in support of the aim of this study in comparing protective variables between rural and urban juveniles that may correlate with substance abuse, specifically prescription drug misuse.

### **Theoretical Framework: Theory of Social Bonds and Delinquency**

While a majority of theories in the criminal justice field attempt to explain why an individual may choose to engage in criminal activities, Travis Hirschi attempted to identify elements in the human social experience that could potentially restrain individuals from choosing to do so. Attachment to others, involvement in conventional activities, commitment to one's aspirations, and the belief in moral obedience were linked together in what Hirschi called the "social bonds", which formulated his theory of social bonds and delinquency (1969). In this section, how the social bonds may affect juvenile delinquent behavior was further discussed.

#### **Attachment**

The first and most crucial element of this theory, as identified by Hirschi (1969), is the social bond labeled attachment. This term was used to explain the feeling of emotional closeness in which a juvenile may fear losing in response to negative behavior. If a juvenile believes that the consequences of their actions will result in disappointing a parent or any individual with whom they share an emotional bond, they may refrain from offending (Lilly, Cullen, & Ball, 2015). The utilization of this concept by parents is known as indirect control, which Hirschi (1969) explained was a psychological method of surveillance for juveniles.

A meta-analysis by Hoeve, Stams, van der Put, Dubas, and van der Laan (2012) summarized findings from previous studies on this element of social bonds in order to analyze to what extent the element of attachment restrained juveniles from becoming delinquent. The

researchers were able to find evidence in support of this element in a majority of their sample studies. Parent-child attachments were found to be the most influential in restraining juveniles from becoming delinquent. When comparing parental attachment to prescription drug misuse, Ford (2009) found that juveniles who had better relationships with their parents were less likely to abuse prescription medication. Although the geographical location of the study subjects was not factored in, this study provided support for the idea that fear of disappointing a parental figure could prevent juveniles from dabbling in prescription medication misuse.

Research on the differences between attachment in rural versus urban juveniles is lacking. Park, Melander, and Sanchez (2016) found support for this theory when analyzing juveniles in the Midwestern rural areas of the United States. Their results showed that juveniles who demonstrated higher levels of attachment to their parents were less likely to partake in the misuse of prescription medication. The current study aims to replicate these results with a larger sample size from areas all across the United States.

### **Involvement**

Hirschi (1969) labeled the next element of his theory involvement, which referred to the presence of conventional activities available to juveniles in order to restrain them from partaking in criminal activities. This element did not particularly allude to the extent in which the juvenile may be invested in whatever activity they were to partake in but instead proposed that the time spent in non-delinquent endeavors limited the time available for juveniles to participate in crime. Structured activities, such as sports teams or school clubs, presented positive environments in which juveniles were able to be supervised by adults, and spend time forming pro-social relationships with other socially-bonded juveniles (Lilly, Cullen, & Ball, 2015).

Results from previous studies have demonstrated support for this element of social bond theory. Shears, Edwards, and Stanley's (2006) study of rural and urban adolescents found that activities outside of school settings were less accessible to rural youth. Because of this, bonds created within schools were deemed crucial for providing these juveniles with pro-social activities to occupy their idle time. Park, Melander, and Sanchez (2016) also presented evidence for this element of social bond theory. The researchers found that when legal recreational activities were available for the juvenile population in rural areas, they became less likely to partake in the misuse of prescription medication. Unfortunately, the findings from Park, Melander, and Sanchez (2016) could only be generalized to juveniles from the Midwestern region of the United States.

This element of social bond theory may yield interesting results when analyzed in rural areas. Because of a lack in funding and financial stability in rural America (Thiede, Lichter, & Slack, 2018), juveniles may not have access to conventional activities that could otherwise prevent them from getting involved in crime. This was observed by Moore et al. (2010), which found that parents in rural areas were greatly disgruntled with the availability of resources within their communities for juvenile involvement in pro-social endeavors. They also reported that distance between available activities, as well the costs, created barriers for them when thinking of enrolling their children in these extra-curricular activities. Because of this lack of juvenile involvement within their communities, substance abuse may be a result of boredom in rural areas.

### **Commitment**

The third social bond, as defined by Hirschi (1969), was the element of commitment. Hirschi (1969) did not refer to this element as the amount of time a juvenile spent on an activity.

Instead, he defined it as the degree to which the amount of time spent mattered to the individual. Hirschi (1969) explained that when a juvenile felt invested in something that they had worked toward, the fear of losing their investment through punishment for negative actions restrained them from becoming a criminal. For juveniles, the most common type of investments was focused on their future, such as educational or occupational aspirations (Lilly, Cullen, & Ball, 2015).

When assessing the relationships between commitment to education and delinquency, Payne (2008) found support for this element of social bond theory. The researcher examined how commitment to education related to the likelihood of delinquency in students of both communally organized and unorganized schools. Her results yielded that despite the level of communal organization, students who demonstrated higher levels of commitment to educational achievement were less likely to partake in criminal activities. Many previous studies have also demonstrated support for this element of social bond in restraining delinquency within the juvenile population (Jenkins, 1997; Ford, 2009; Shears, Edwards, & Stanley, 2006). When comparing this element of social bond between geographical location, Gardner and Shoemaker (1989) found that students who reported a stronger sense of commitment to school were less likely to be delinquent in both rural and urban areas. Similar results were found by Park, Melander, and Sanchez (2016) when assessing the elements of social bond in a sample of Midwestern American juveniles.

Ford (2005) attempted to measure the effects of commitment to education on juvenile substance abuse. By measuring the construct of commitment (importance of academic success), rather than school performance, the researcher failed to find a link between commitment and illicit drug use. This study focused on marijuana use, as well as a combined category of “illicit



drugs”, and did not specifically seek to measure the effects of commitment on prescription drug misuse. To date, research on this element of the social bond theory and its effect on juvenile prescription drug misuse is lacking, especially concerning geographical location.

### **Belief**

Lastly, Hirschi (1969) labeled the element of belief as the final piece of his theory of social bonds. This element referred to the extent to which a juvenile embraced a moral code that encouraged them to restrain from offending. This could range from attitudes toward religious moral codes, school rules, or legal regulations. These beliefs did not, however, pertain to the level in which a juvenile believed in unconventional values. Instead, it only applied to beliefs in conventional norms, which fell in line with societal regulations that may punish a delinquent for partaking in criminal activities (Lilly, Cullen, & Ball, 2015).

When testing this element of theory in the context of schools, Payne (2008) compared general moral beliefs with the rates of delinquency between students. Students who expressed a greater sense of legitimacy to school rules were less likely to be delinquent. Without other resources for social bonding in remote areas, schools may be one of the few places in which rural juveniles can develop their moral compass. Embracing school regulations may translate as a model of restraint from delinquency for rural juveniles (Shears, Edwards, & Stanley, 2006).

Belief in religious principles have also been linked to restraint in delinquency. In order to better understand this relationship, Johnson, Jang, Larson, and Li (2001) compared the effects of involvement in religious services and attitudes toward religion, with attitudes toward unconventional beliefs and self-reported delinquency. The researchers were able to conclude that juveniles who spent more time practicing their religious beliefs were less likely to believe in unconventional values, or engage in delinquent behavior. Similar results were noted by Hill and

Pollock (2015) when comparing belief in religion and substance abuse. Without accounting for geographical location, adolescents who expressed higher levels of religiosity were less likely to engage in the use of hard drugs.

In rural areas, socialization frequently occurs during religious-type services and events and is an essential aspect of rural life (Azzi & Ehrenberg, 1975). However, there is no existing research to-date that aims to measure the effects of religious beliefs on juvenile delinquency, based on geographical location. More specifically, there lacks research on whether or not religious beliefs act as a protective factor in prescription drug misuse within juvenile populations.

### **Chapter Summary**

Although NMPDU poses a national threat, rural communities in the United States have experienced higher levels of disturbance from abuse, diversion, and deaths related to prescription drug misuse (King, Fraser, Boikos, Richardson, & Harper, 2014; Modarai et al., 2013; Wunsch, Nakamoto, Behonick, & Massello, 2009; Y & Paulozzi, 2008). Just as in adult rural populations, rural adolescents have experienced these disturbances at higher proportions than their urban equals (Ford, 2009; Havens, Young, & Havens, 2011; Monnat & Rigg, 2016; Pettigrew, Miller-Day, Krieger, & Hecht, 2012; Pruitt, 2009; Rhew, Hawkins, & Oesterle, 2011; Serdar & Spencer, 2002; Young, Havens, & Leukefeld, 2012). Some differencing factors between urban and rural communities have been previously used to explain why this phenomenon has repeatedly found in research.

The goal of this chapter was to provide an overview of the NMPDU epidemic in the United States, and how it generally differs within rural and urban populations, as well as specifically within rural and urban juveniles. Furthermore, by providing information regarding

the theoretical framework used in this study, this chapter aimed to review previous literature which examined factors similar to the ones identified by Hirschi (1969) that have previously shown to restrain delinquency within juvenile populations.

This study aimed to bridge a gap in literature regarding juvenile prescription drug misuse and protective factors that may differ between rural and urban juveniles. Identifying differences between rural and urban juvenile prescription drug misuse will help better inform future policies and programs that target juvenile substance abuse. In the following chapter, the methodology utilized in this study was further explained.

## CHAPTER 3

### DATA AND METHODOLOGY

The objective of this study was to fill the gap in the current literature by examining the dynamic nature of prescription drug abuse in rural youth in comparison to urban youth. While previous studies have provided insight into factors potentially related to adult NMPDU, little is known about factors regarding youth NMPDU. In this study, variables derived from the 12th grade class of the 2015 Monitoring the Future Survey were utilized in order to assess the differences between behaviors of MSA and non-MSA juveniles in relation to the misuse of prescription drugs. Answers to questions regarding parental attachment, involvement in hobbies and recreation, commitment to academic achievements, and perceptions of religious beliefs were analyzed to determine the possible relationship between these variables of socialization and their potential relationships with prescription drug misuse in the two different populations of adolescents. This chapter sought to present the research questions proposed within this study, along with a prediction of outcomes on account of previous findings. Conceptualizations for each of the variables utilized were explained. Additionally, a description of the Monitoring the Future Survey, along with details regarding data collection, was presented. The plan of analysis for evaluating all of the hypotheses in question was also discussed. Limitations found within this study concluded this chapter.

#### **Primary Research Question**

The primary research question for this study was: *How does prescription drug use differ among urban and rural youth?* While the United States as a whole has seen an increase in the misuse of prescription medication since the mid-1990s (Drug Enforcement Administration, 2018), rates of misuse and overdose are primarily higher in rural communities across the United

States (Gundy, 2006; Paulozzi, 2012; Wunsch, Nakamoto, Behonick, & Massello, 2009; Young, Havens, & Leukefeld, 2012). Similar findings have been made within juvenile populations using samples from specific parts of the country (Park, Melander, & Sanchez, 2016; Pettigrew, Miller-Day, Krieger, & Hecht, 2012; Wunsch, Nakamoto, Behonick, & Massello, 2009), yet nationally representative samples are limited. Previous research into differences between rural and urban prescription drug misuse has generally found that misuse is more common in rural rather than urban areas (Ford, 2009; Havens, Young, & Havens, 2011; Monnat & Rigg, 2016; Pettigrew, Miller-Day, Krieger, & Hecht, 2012; Pruitt, 2009; Rhew, Hawkins, & Oesterle, 2011; Serdar & Spencer, 2002; Young, Havens, & Leukefeld, 2012). In accordance with these findings, it was hypothesized in this study that *there would be higher rates of self-reported non-medical prescription drug misuse in the rural sample of juveniles as compared to the urban sample.*

For the assessment of this research question, population density and the reported rate of prescription drug misuse were analyzed through variables found within the Monitoring the Future Survey. Youth included in this study were operationalized as 12<sup>th</sup>-grade high school students. To operationalize rural and urban, two demographic variables within the Monitoring the Future Survey were utilized. The Monitoring the Future Survey used the term “metropolitan statistical areas” (MSAs) to categorize urban areas of the United States. These areas were defined as “county or group of contiguous counties that contain at least one city of 50,000 inhabitants or more” (U.S. Census Bureau, 2012). In this study, urban areas observed within the Monitoring the Future Survey were operationalized as MSAs. The Monitoring the Future Survey used the term “non-metropolitan statistical areas” (non-MSAs) to categorize any observed areas which fell beneath the threshold given by the U.S. Census Bureau (2012) for defining an MSA. These areas held a population of less than 50,000 inhabitants in at least one

city within the county. For the purpose of this study, rural areas were operationalized through non-MSAs. MSAs and non-MSAs were measured in the data set using nominal variables (0=Non-MSA, 1=MSA). This variable was pre-determined by the researchers and was without input from the study participants.

*Prescription drug misuse* was operationalized through the use of self-reported measures derived from the 2015 Monitoring the Future Survey. For the purpose of this study, prescription drugs were considered substances strictly prescribed by doctors and unavailable for over-the-counter purchase (Johnston et al., 2018). The four subcategories of prescription medications included in this study were amphetamines, sedatives, tranquilizers, and other medically-prescribed narcotics (opioids). Misuse of the substance was determined through the assessment of use without a valid prescription from a medical professional in the last 12 months. In the survey, students were asked about frequency of use regarding amphetamines, sedatives, tranquilizers, and other medically-prescribed narcotics (opioids) without a doctor's orders in the past 12 months. A dichotomous variable was provided within the data set regarding each prescription drug. Each variable was coded 0=No and 1=Yes to whether or not the juvenile had at least one incident of misuse of any of the listed drugs within the previous 12 months. For the purpose of this study, each dichotomous variable was combined into a composite measure, which was coded 0=No if they had not misused any of the listed drugs in the previous 12 months, and 1=Yes if they had misused any of the prescription drugs in the previous 12 months. Prescription drug misuse was utilized as the dependent variable for each analysis.

This study aimed to compare trends in prescription drug misuse between rural and urban juveniles. To date, the Monitoring the Future Survey has not yet been utilized in making this comparison. Using the variables from this survey, the current research went on to explore the

relationships between different aspects of socialization and prescription drug misuse. Four secondary questions were formulated in order to better understand how parental attachment, involvement in conventional activities, commitment to academics, and religiosity affect the likelihood of juvenile prescription drug misuse in rural versus urban areas in the United States.

### **Secondary Research Questions**

The first secondary research question for the current study was: *What is the relationship between parental attachment and prescription drug misuse between rural and urban juveniles?*

As proposed by Hirschi (1969), parental attachment can serve as a restraint for delinquency within juvenile populations. The fear of disappointing a parental figure was thought to be a deterrent from wayward behavior. The purpose of this research question was to explore how parental attachment differs in rural versus urban areas in restraining juvenile prescription drug misuse. Since higher rates of prescription drug misuse were expected to be found in rural areas more so than in urban areas, the hypothesis associated with this question was: *Parental attachment would be less of a protective factor for juveniles in rural areas than in urban areas.*

The new concept proposed in this research question was parental attachment. *Parental attachment* has been defined as the feeling of emotional closeness to one's parents, which inhibits indirect social control that prevents delinquency (Hirschi, 1969). This concept was operationalized through a variety of measures derived from the Monitoring the Future Survey, including *satisfaction of parental relationship* and *the importance of living close to your parents*. Satisfaction with parents was examined by asking respondents the question, "how satisfied are you with the way you get along with your parents?" and was coded as 7=Completely satisfied, 4=Neutral, 1=Completely dissatisfied. The *importance of living close to your parents* was assessed by asking the respondents, "How important is each of the following in your life? J:

Living close to you parents” and was coded as 7=Very important, 4=Neutral, 1=Not important. Both variables were analyzed individually in order to better understand their relationships with prescription drug misuse. These variables aligned with the theoretical work of Hirschi (1969), in that juveniles who felt emotional connections with their guardians were less likely to become delinquent. Satisfaction with parental relationship worked to measure the emotional connection, and the importance of living close served to measure dependence on parental guidance.

The next secondary research question was: *What is the relationship between involvement in conventional activities and prescription drug misuse between rural and urban juveniles?*

Since lack of involvement in pro-social activities have been linked to delinquency (Mahoney & Stattin, 2000; Rhew, Hawkins, & Oesterle, 2011; Shears, Edwards, & Stanley, 2006), and higher rates of prescription drug use were expected in rural areas, it was hypothesized that: *involvement in conventional activities would be less of a protective factor for juvenile in rural areas than in urban areas.*

*Participation in conventional activities* was operationalized through measuring self-reported involvement in activities derived from the Monitoring the Future Survey. The first variable measured *the importance of having time for recreation and hobbies*, which was asked as “how important is each of the following in your life? D: Having plenty of time for recreation and hobbies”, and was coded as 1=Not important, 2=Somewhat important, 3= Quite important, 4=Extremely important. The second variable used to measure this concept was *how many evenings a week are spent doing things that are fun and recreational*, and was asked as “during a typical week, on how many evenings do you go out for fun and recreation?”. This was coded as 1=Less than 1, 2=One, 3=Two, 4=Three, 5=Four or five, 6=Six or seven. Due to the use of secondhand data, the variables utilized within this study were not specifically constructed to



measure what was intended. These two variables, however, were the closest to capturing the importance and frequency of time spent in conventional activities, as proposed in Hirschi's (1969) theory of social bonds.

The third secondary questions was: *What is the relationship between academic achievement and prescription drug misuse between rural and urban juveniles?* Since commitment to educational aspirations has been linked to restraint in delinquency (Ford, 2009; Havens, Young, & Havens, 2011; Payne, 2008; Shears, Edwards, & Stanley, 2006), it was hypothesized that *commitment to academics would be less of a protective factor for juveniles in rural areas than in urban areas.* As explained by Hirschi (1969), having a stake in conformity, such as future educational aspirations, decreases the likelihood that a juvenile may dabble in delinquency.

In order to operationalize the independent variable of *commitment to academics*, measures derived from the Monitoring the Future Survey regarding academic achievement were individually assessed against the dependent variable. One variable utilized was *the possibility of furthering education* and was asked as “how likely is it that you will do each of the following things after high school? C. Graduate from college” and was coded as 1=Definitely won't, 2=Probably won't, 3=Probably will, 4=Definitely will. The next variable used was *frequency of understanding the purpose behind assigned school work* and was asked as “how often do you feel that the school work you are assigned is meaningful and important?” and was coded as 5=Almost always, 4=Often, 3=Sometimes, 2=Seldom, 3=Never. The last variable used to measure this concept was *seeing school as an enjoyable experience* and was asked as “how much do you agree or disagree with each statement below? I: Going to school has been an enjoyable experience for me”, which was coded as 1=Disagree, 2=Mostly disagree, 3=Neither, 4=Mostly

agree, 5=Agree. These variables available within the dataset best captured how the study participants viewed academics and saw it as something they wished to pursue beyond high school. Seeing school as being something worth investing time into, as well as the fear of losing the ability to further pursue academics, may keep a juvenile from becoming delinquent, as proposed by Hirschi (1969).

Lastly, the fourth secondary research question was: *What is the relationship between religiosity and prescription drug misuse between rural and urban juveniles?* According to Hirschi (1969), acceptance and strength of conventional beliefs were factors in restraining juvenile delinquency. Since socialization largely centers around religious services in rural communities (Azzi & Ehrenberg, 1975), it was hypothesized that *religiosity would be more of a protective factor for juveniles in rural areas than in urban areas.*

The independent variable of *religiosity* was measured through two variables derived from the Monitoring the Future Survey. These variables assessed *the importance of religion in one's life* which was presented in the Monitoring the Future Survey as "how important is religion in your life?". This variable was coded as 1=Not important, 2=A little important, 3=Pretty important, 4=Very important. The second variable used to access this concept was *how often one attends religious services*, and was asked as "how often do you attend religious services?". This was coded as 1=Never, 2=Rarely, 3=Once or twice a month, 4=About once a week or more. Although it is difficult to capture one's beliefs through qualitative investigation, gauging involvement in religion through these variables could assist in determining how exposure to religion can act as a protective factor from juvenile delinquency. Although this study did not partake in primary data collection, the Monitoring the Future Survey provided a reliable and extensive selection of variables that were able to be utilized for the purpose of exploring

socialization in a large sample of juveniles. The following section explained the data collection process for the 2015 Monitoring the Future Survey.

### **Data**

The 2015 Monitoring the Future Survey was utilized as the primary data source for the current study. The Monitoring the Future Survey is an ongoing cross-sectional study conducted via self-questionnaires and collected by researchers from the University of Michigan. Since 1975, the Monitoring the Future Survey has been administered to 8<sup>th</sup>, 10<sup>th</sup>, and 12<sup>th</sup> graders during the spring of each year to approximately 420 public and private middle and high schools throughout the United States. Approximately 45,00 adolescents are included in this survey per year. The purpose of this study has been to provide policymakers with a better understanding of the changing trends in substance abuse, delinquency, attitudes, and beliefs within youth in the United States by using a nationally representative random sample (Johnston, O'Malley, Schulenberg, & Miech, 2015).

The 2015 Monitoring the Future Survey data collection process began with a 3-part multistage random sample design. First, geographic areas across the United States were selected. Next, schools within those regions were chosen based on probability proportionate to the size those areas. Lastly, classes within the selected schools were separated so that the 8<sup>th</sup>, 10<sup>th</sup>, and 12<sup>th</sup> graders could be given the opportunity to participate in the study, with a maximum of 350 students from each school (Johnston et al., 2015).

Prior to survey administration, students were given information explaining their role as participants in the study, along with letters to parents with similar information and the option to decline participation of their student in the study. Surveys were conducted through standardized procedures by the local Institute for Social Research representatives and their assistants. The

questionnaires were administered in group settings during regular school hours (Johnston et al., 2015). The survey materials were then returned to the researchers at the Survey Research Center located at the University of Michigan. The data collected contained some identifying information for follow-up purposes, but confidentiality procedures were ensued in order to protect the study participants. The use of this dataset within the current study was explained in the following section.

### **Methods & Analysis**

In an effort to evaluate the research questions proposed within this study, variables derived from the 2015 Monitoring the Future Survey were analyzed. This section first served to explain how this secondary dataset was cleaned. Next, the statistical tests utilized in this study were discussed. Additionally, the use of control variables was outlined and explained within this section. Finally, limitations found within this study were explained.

### **Data Cleaning**

The 2015 Monitoring the Future Survey data was made available online through the ICPSR website, which is managed by the Institute of Social Research at the University of Michigan. In order to collect extensive amounts of data, each study participant is given one of seven versions of the survey. Each survey included core information asked to all participants, as well as a variation of questions depending on the form number. Variables found in the core data form and the DS2 form were selected for the purpose of this study. The combination of these two sets allowed for the largest possible sample size to be examined, since variables derived from both could be found in both forms. Study participants were given number identifiers so that each case could be matched within the separate forms once merged together.

Once the variables for measuring parental attachment, involvement in conventional activities, commitment to academics, and religiosity were located within the new combined data set, they were renamed for easier identification. Additional measures utilized in this study such as race, sex, MSA/Non-MSA status, and case identifiers were also renamed for easier recognition. Variables that were used as dependent measures for this study were pre-dichotomized by the survey developers. These variables were also renamed for easier identification. Variables which were not utilized within this study were then removed from the data set.

The final step in data cleaning was the development of one overall dependent variable. Within the Monitoring the Future Survey, students were asked about each prescription drug category (amphetamines, tranquilizers, sedatives, and narcotics) individually. This study did not account for the differences between the drugs, and aimed to look at prescription drug misuse as a whole. To create a variable that measured overall prescription drug misuse in the previous year, four dichotomous variables were combined in order to form a new variable. In this variable, 0=No or no misuse of any prescription drug in the previous 12 months, and 1=Yes or misuse of at least one prescription drug in the previous 12 months. The control variable *race* was also simplified to 0=White and 1=Non-white. Independent variables were not combined into composite measures due to due to low scores on a factor analysis scale.

## **Analysis**

For the purpose of this study, secondary data from the 2015 Monitoring the Future Survey was analyzed through a non-experimental research design. The implementation of a non-experimental study design presented some advantages in the process of analysis. First, it allowed for the exploration of a large nationally representative sample. The sampling procedures of the

Monitoring the Future Survey expanded access to juveniles in other national regions that may have otherwise been inaccessible for this study (Johnston, O'Malley, Schulenberg, & Miech, 2015). Additionally, the utilization of this dataset made access to information less demanding, allowing for the analysis of the data to be immediate and efficient.

Analysis of the identified research variables were conducted using SPSS software. First, frequencies and descriptive statistics were computed in order to determine basic demographic information from the rural and urban youth population samples. The primary research question proposed within this study aimed to compare the differences in prescription drug misuse between rural and urban adolescents. In order to do this, frequencies regarding prescription drug misuse were computed.

The second stage of analysis was the calculation of bivariate correlations between the independent variables to assess the possibility of multicollinearity. Since multiple variables were used to measure single concepts, correlations were expected. Despite this, independent variables that are too highly correlated can ultimately pose a threat to the validity of a logistic regression model (Fox, Levin, & Forde, 2014). The possibility of intercorrelations within this model would limit the aptitude of measuring the individual effects of the independent variables on the misuse of prescription drugs.

The third and final stage of analysis within this study was comprised of three separate logistic regression models. Binary logistic regression was appropriate because the dependent variable of whether or not a prescription drug had been misused in the previous year was measured dichotomously. In addition, this method was implemented to determine the impact of each independent variable on the probability of prescription drug misuse (Fox, Levin, & Forde, 2014). In the first model, prescription drug misuse was measured against parental attachment,

involvement in conventional activities, commitment to academics, and religiosity in order to determine a relationship in the overall population sample of juveniles. The same methods were used for the construction of two additional models. Model 2 included the sample of rural juveniles, and Model 3 included the sample of urban juveniles. A factor analysis scale was conducted on the variables used to measure parental attachment, involvement in conventional activities, commitment to academics, and religiosity to determine if these variables could be combined into composite measures. These variables were not combined due to low scores on a factor analysis scale. Therefore, they were tested independently in the three separate logistic regression models.

### **Control Variables**

In an effort of managing potential interacting effects of demographics, this research controlled for *sex*, and *race*. By including these variables in the current study, it allowed for a greater understanding of how the social bonds differ within rural and urban settings in regard to prescription drug misuse in adolescent populations. Previous studies have noted differences in prescription drug misuse between males and females, as well as discrepancies in misuse patterns between races. In a study by Simoni-Wastila, Ritter, and Strickler (2004), white individuals were found to be more likely to abuse prescription medication. The researchers also found that women more often misused these medications than men. In agreement with these results, a study by Ford (2009) also found discrepancies in prescription drug misuse between sex and race. The researcher reported higher rates of misuse within female populations, as well as higher rates of misuse in white individuals. In efforts to account for these known differences in prescription drug misuse, sex and race variables were included in the logistic regression models within this study to control for spuriousness.

In the Monitoring the Future Survey, participant sex was recorded and coded as 1=Male, and 2=Female. Race was asked as “How do you describe yourself?” and was coded as 1=Black or African, 2=White (Caucasian), 3=Hispanic. In order to simplify this variable, race was recoded into 0=White and 1=Non-white. Both variables were included in all three logistic regression models.

### **Limitations**

The current study was not without limitations. The variables utilized in this study were pulled directly from the Monitoring the Future Survey. In using a secondary data source, the variables cannot be manipulated to perfectly fit a study objective. Nevertheless, since the amount of data available through the publication of the Monitoring the Future Survey is so extensive, measurement variables for this study were not lacking. Additionally, secondary data does not present the opportunity for control within the data collection process. Without involvement during data collection, there is no guarantee that procedures for collecting the data were accurate. However, the Monitoring the Future Survey has been conducted since 1975. The availability of grant funding for this project has allowed for it to continuously develop as well as improve its methods of data collection (Johnston, O'Malley, Schulenberg, & Miech, 2015).

Furthermore, the variables used for differentiating urban areas (MSA) from rural areas (non-MSA) used in the Monitoring the Future Survey do not entirely account for the variability between the two areas, which may have an overall effect on the results of this study. Although these variables use population density as a basis, they do not account for elements such as population demographics or the unique social and cultural characteristics of each area. Unfortunately, there is no perfect measure available for capturing the true distinctions between rural and urban areas. MSA and non-MSA have been used in previous federal as well as non-



federal data sources (Strong, Del Grosso, Bhatt, Phillips, & Scheppke, 2005), however, and have previously provided a baseline for distinguishing between the two regions. Another methodological limitation is the smaller sample size of non-MSA students (19% of the sample size) as compared to MSA students (81% of the sample size). If both categories of participants equaled in size, differences could potentially occur in the results of each analysis. Both sample sizes, however, were large enough for individual analysis (Fox, Levin, & Forde, 2014).

Finally, this study did not seek to measure the intensity of drug use. Given that the dependent variable was dichotomous, how often a juvenile participated in nonmedical prescription drug use was unaccounted for. Additionally, it does not entail whether the misuse of the prescription drug was for the purpose of self-medication or recreation, nor were the drug types measured individually. These elements are outside of the scope of this study, yet may present an opportunity for future research including these specific measurements.

### **Chapter Summary**

This chapter served the purpose of providing an overview of the methodology utilized in the current research. This research used a non-experimental design to explore the differences in prescription drug misuse between rural and urban juveniles. Additionally, factors related to socialization were measured in relation to prescription drug misuse. Data used for the exploration of these variables were extracted from the 2015 Monitoring the Future Survey. Before analysis, the data set was cleaned for the purpose of tailoring the information to the current study. Analysis of the data occurred in three stages. First, descriptive statistics were provided to provide a better understanding of the study sample. In this stage, frequencies were also calculated to answer the primary research question. Then, bivariate correlations were calculated to ensure that the independent variables would not pose the threat of multicollinearity. Lastly, three separate

logistic regression models were computed to determine the impact of the independent variables on prescription drug misuse. The results of these analyses were discussed in the following chapter.

## CHAPTER 4

### RESULTS

The primary goal of this study was to explore differences in prescription drug misuse within rural and urban juvenile populations. Focusing on factors of socialization thought to have protective tendencies (Hirschi, 1969), four secondary questions explored different aspects within rural and urban juvenile populations in how they correlated with prescription drug misuse. The purpose of the current chapter was to highlight and summarize the results of the various statistical analysis that were conducted for this study. These analyses included univariate, bivariate, and multivariate statistical tests in order to fully understand the relationships between each variable presented. First, descriptive statistics were explored to better understand the study population as well as the variables within the research. Second, bivariate statistical analyses were computed so that potential correlations between the independent variables were controlled for in order to avoid issues with multicollinearity. Finally, three multilevel models (using a logistic regression) were computed in order to test the multiple hypotheses presented within this study.

#### **Sample Descriptives**

The first step within the current research was the calculation of descriptive statistics. This was completed to better understand the characteristics of those included in the sample. The sample of 12<sup>th</sup> graders from the Monitoring the Future Survey included 2,299 total participants. Males made up the majority of the sample. In regard to race, 48.1% of the sample identified as white making this group the majority. It was also noted that 81% of the sample reported residing in metropolitan statistical areas, and only 19% of participants resided in non-metropolitan statistical areas. A breakdown of these descriptives were provided in *Table 1*.

Table 1: *Sample Descriptives*

Variable	N		%		Total
	Urban	Rural	Urban	Rural	
Male	835	187	44.8%	42.9%	1,022
Female	805	296	43.2%	52.4%	1,011
White	845	261	45.4%	59.9%	1,106
Black	235	65	12.6%	14.9%	300
Hispanic	338	28	18.1%	6.4%	366
<b>Total</b>	1,863	436			

Assessing sample characteristics of the participants used in this study allowed for a better understanding of the study results. It is important to note that while the sample was predominately white and urban, utilizing a secondary data source such as the Monitoring the Future Survey allowed for greater outreach in study participants, which may not have been available otherwise. A comparison of prescription drug misuse between the rural and urban samples of juveniles was discussed in the following section.

### **Univariate Results**

The primary research question proposed within this study was: *how does prescription drug use differ among urban and rural youth?* Simple frequencies were conducted in SPSS on the samples of urban and rural juveniles to determine how many had claimed to misuse prescription medication in the previous year. Analysis of the data indicated that 40 (9.2%) juveniles in rural areas had claimed to have misused one of the four prescription drugs in the past 12 months, as compared to 168 (9.0%) of juveniles in urban areas. This finding was in agreement

with the proposed hypothesis. However, the number of urban juveniles that answered this question (N= 1,595) was much higher than rural juveniles (N=385). While both sample sizes were sufficient for analyses utilized in this study, a larger number of rural juveniles could significantly alter the results of this question.

### **Bivariate Results**

To ensure that the data would not be affected by the possibility of multicollinearity, bivariate correlations were analyzed between each of the independent measures. Multicollinearity poses a threat to regression models when the independent variables appear to be closely measuring a similar concept. According to Bachman and Paternoster (2017), correlations between two independent variables where  $r=0.7$  could potentially result in multicollinearity.

Results of these analyses showed no threat of multicollinearity. As presented in *Table 2*, the independent variables within this study did not present a correlation coefficient higher than 0.7. The strongest correlation existed between *importance of religion* and *attendance of religious services* ( $r=.655$ ;  $p<0.01$ ). This did not, however, exceed the threshold of 0.7 or above; therefore, it did not pose a threat to validity due to multicollinearity. Control variables were also analyzed for correlations. Although correlations did exist between sex, race, and the independent variables, these results were not above the threshold for multicollinearity. A full summary of these findings were provided in *Table 2*, which was presented in the following page.

Table 2: *Bivariate Correlations*

Variables	1	2	3	4	5	6	7	8	9	10	11
1. Satisfaction with Parental Relationship	–										
2. Importance of Living Close to Parents	.224**	–									
3. Likelihood of Furthering Education	.001	-.007	–								
4. Frequency of Understanding Purpose of Schoolwork	.131**	.045*	.090**	–							
5. Seeing School as an Enjoyable Experience	.267**	.174**	.107**	.256**	–						
6. Importance of Religion	.180**	.048	.069**	.139**	.209**	–					
7. Attending Religious Services	.147**	.087**	.094**	.095**	.204**	.655**	–				
8. Importance of Recreation	.003	.006	.041	-.013	.064**	-.019	.023	–			
9. Number of Outings in a Week	.120**	.081**	-.018	-.005	.073**	.020	.52*	.138**	–		
10. Sex	-.133**	-.074**	.160**	.027	-.051*	.158**	.121**	.094**	.075**	–	
11. Race	-.041*	-.155**	.047*	.088**	.017	.097**	.002	.008	-.076	-.015	–

\*\*p<.01; \*p<.05

## Multivariate Results

The final stage of analysis within this study consisted of three separate logistic regression models. A logistic regression model best fit the current study due to the presence of multiple independent variables, and the dichotomous nature of the dependent variable. Discussed first in this section were the results of the logistic regression models for the total sample, the rural sample, and the urban sample. Then, the four secondary research questions proposed within this study were addressed.

Within each model, nine independent variables were used to measure parental attachment, involvement in conventional activities, commitment to academics, and religiosity against the dependent variable of prescription drug misuse in the previous 12 months. Control variables of race and gender were included in each model to account for the possibility of spuriousness. The purpose of this was to ensure that only the independent variables had an influence on the outcome, with no interactions from other variables.

In Model 1, parental attachment, involvement in conventional activities, commitment to academics, and religiosity was measured against non-medical prescription drug use in the entire sample of juveniles. In this model, the control variables of *race* ( $p=.921$ ) and *sex* ( $p=.256$ ) were found to be insignificant in predicting the outcome of the dependent variable. Additionally, this model appeared to be the best fit for explaining the relationship between the independent variables and the dependent variable when compared to the other two models on their own ( $\chi^2=32.75$ ;  $p=.001$ ). According to Nagelkerke R square estimates, Model 1 was also able to explain 5.3% of the variance in the data.

Model 1 included two independent variables that were found to be significant in predicting prescription drug misuse. These were *satisfaction of parental relationship* ( $p=.001$ )

and *how many evenings a week are spent doing things that are fun and recreational* ( $p=.002$ ). As satisfaction of parental relationships decreased, the likelihood that a juvenile would fall into the drug misuse category increased ( $\beta= -.175$ ). Assessment of the odds ratio associated with satisfaction with parental relationship ( $\text{Exp}(B)= .839$ ) revealed that an increase by one unit in the measure resulted in a 16.1% chance decrease that the juvenile would fall under the drug misuse category. Unlike the satisfaction of parental relationships, the number of evenings a week spent out did not act as a protective factor from prescription drug misuse ( $\beta= .203$ ). Assessing the provided odds ratio ( $\text{Exp}(B)= 1.226$ ) suggested that with each unit increase in the measure, the likelihood that the juvenile would fall under the category of drug misuse increased by 22.6%. The results of the remaining variables can be found in *Table 3*.

Model 2 measured parental attachment, involvement in conventional activities, commitment to academics, and religiosity against non-medical prescription drugs using only the rural sample of juveniles. The control variables of *race* ( $p= .596$ ) and *sex* ( $p= .111$ ) were found to be insignificant in this model. The model appeared to be a good fit for explaining the relationship between the independent variables and the dependent variable in regard to rural adolescents ( $\chi^2= 24.734$ ;  $p= .010$ ). The Nagelkerke R square estimate calculated for Model 2 was able to explain 15.7% of the variance in the data.

Only one variable appeared to be significantly related to prescription drug misuse within Model 2. Results of this analysis showed that *the importance of living close to one's parents* acted as a protective factor from prescription drug misuse ( $\beta= -.308$ ;  $p= .004$ ). Assessing the provided odds ratio ( $\text{Exp}(B)= .805$ ) suggested that rural juveniles became 26.5% less likely to fall under the drug misuse category with each unit increase in this parental attachment measure.



The third model analyzed in this study looked at the relationship between parental attachment, involvement in conventional activities, commitment to academics, and religiosity and the dependent variable of non-medical prescription drugs using only the urban sample of juveniles. Similar to the first two models, the control variables of *race* ( $p=.806$ ) and *sex* ( $p=.659$ ) were not found to be significant in the model of urban juveniles. Model 3 was also more significant in explaining the relationship between the independent variables and the dependent variable for urban juveniles ( $\chi^2= 31.631$ ;  $p= .001$ ) than for rural juveniles ( $\chi^2= 24.734$ ;  $p= .010$ ). According to the Nagelkerke R square estimate, Model 3 was able to explain 6.8% of the variance in the data.

Analysis of Model 3 showed that *satisfaction with parental relationship* ( $p= .007$ ) and *how many evenings a week are spent doing things that are fun and recreational* ( $p= .001$ ) were significantly related to prescription drug misuse within the urban sample. Similar to Model 1, juveniles in Model 3 became more likely to fall into the drug misuse category as the satisfaction of the relationship with their parents decreased ( $\beta= -.176$ ). In the urban group of juveniles, assessment of the provided odds ratio ( $\text{Exp}(B)= .838$ ) revealed that a one unit decrease in satisfaction with one's parental relationship made it 16.2% more likely that they would answer "yes" to having misused a prescription drug in the previous year. Also similar to Model 1, the number of evenings spent doing things that are fun and recreational increased the likelihood that a juvenile would fall under the drug misuse category ( $\beta= .278$ ). This variable had the opposite expected effect. Analysis of the provided odds ratio ( $\text{Exp}(B)= 1.320$ ) showed that with each unit increase in this variable, it became 32% more likely that the respondents would fall under the category of those who had misused a prescription drug in the previous year.

In light of the results of Models 2 and 3, it was revealed that no support was provided for the hypotheses under research question one. Research question one stated: *what is the relationship between parental attachment and prescription drug misuse between rural and urban juveniles?* It was hypothesized that *parental attachment would be less of a protective factor for juveniles in rural areas than in urban areas.* The variable *satisfaction with parental relationship* was found to be significant in the urban sample ( $p = .007$ ), while the variable *importance of living close to parents* was found to be significant in the rural sample ( $p = .004$ ). In the rural sample, *satisfaction with parental relationship* was not significant at the .05 alpha level, but it was significant at the .10 alpha level ( $p = .052$ ). These results were not in agreement with the research hypothesis associated with this research question.

The second research question proposed within this study asked: *what is the relationship between involvement in conventional activities and prescription drug misuse between rural and urban juveniles?* Analysis of Models 2 and 3 revealed that the variable *number of outings a week* was found to be significant in the urban Model 3 ( $p = .001$ ). This variable, however, had the opposite expected effect ( $\beta = .278$ ). This may be due to unknowns within the variable, including what type of outings these juveniles engaged in. Neither variable appeared to have a significant protective effect in rural or urban juveniles. Therefore, the hypothesis that *involvement in conventional activities was less of a protective factor for juveniles in rural areas than in urban areas* was not supported.

The next question presented within this study asked: *what is the relationship between commitment to academic achievement and prescription drug misuse between rural and urban juveniles?* Models 2 and 3 indicated that none of the variables utilized to measure this concept yielded significant results. In the rural Model 2, *likelihood of furthering education* ( $\beta = .023$ ),

frequency of *understanding schoolwork* ( $\beta = .339$ ), and *seeing school as an enjoyable experience* ( $\beta = .337$ ) had the opposite expected effect on prescription drug misuse. These findings conclude that the hypothesis for this question was incorrect in predicting that *commitment to academics would be less of a protective factor for juveniles in rural areas than in urban areas*.

The final secondary question proposed in this study sought to answer: *what is the relationship between religiosity and prescription drug misuse between rural and urban juveniles?* The variables *attending religious services* and *importance of religion in one's life* had no significant effect on prescription drug misuse in both Models 2 and 3. This finding indicates that the hypothesis of *religiosity would be more of a protective factor for juveniles in rural areas than in urban areas* was incorrect. Religiosity did not significantly trend in the direction expected.

Table 3: *Regression Results*

Measure	Model 1			Model 2 (Rural)			Model 3 (Urban)		
	$\beta$	SE	p >  z	$\beta$	SE	p >  z	$\beta$	SE	p >  z
Satisfaction with Parental Relationship	-.175**	.054	.001	-.216	.111	.052	-.176**	.065	.007
Importance of Living Close to Parents	-.076	.056	.178	-.308**	.106	.004	.021	.068	.760
Likelihood of Furthering Education	.005	.093	.957	.023	.177	.897	-.028	.113	.806
Frequency of Understanding Purpose of Schoolwork	-.018	.094	.849	.339	.192	.078	-.145	.111	.193
Seeing School as an Enjoyable Experience	-.030	.088	.723	.337	.190	.077	-.136	.102	.183
Importance of Religion	-.071	.117	.543	-.337	.251	.179	-.024	.137	.862
Attendance of Religious Services	-.103	.115	.374	.126	.246	.609	-.156	.134	.244
Importance of Recreation	-.086	.128	.498	-.026	.246	.917	-.115	.153	.451
Number of Outings in a Week	.203**	.067	.002	.092	.125	.462	.278**	.081	.001

Note: \*\*p<0.01; \*p<0.05

## Chapter Summary

The aim of this chapter was to provide an overview of the results of each analysis conducted within this study. Sample descriptives revealed that the Monitoring the Future Survey, which utilized in the current research, was equally distributed between genders, but was majority white. The sample also consisted of fewer rural study participants than urban. To explore the primary research question proposed in this study, simple frequencies were conducted. A greater percentage of rural juveniles engaged in prescription drug misuse than urban juveniles. To analyze the secondary research questions, three separate logistic regression models were computed. Model 1 provided an overview of how the independent variables related to the dependent variable in the entire sample of juveniles. Model 2 was constructed similarly, but was comprised of only the rural sample of juveniles. Model 3 was comprised of only the urban sample. Nine independent variables were compared between Models 2 and 3, revealing discrepancies between protective factors. Parental attachment appeared to a stronger protective factor within the population of rural juveniles. Involvement in conventional activities, commitment to academics, and religiosity had stronger protective impacts on the urban sample of juveniles. These findings were used to answer the research questions in relation to the proposed hypotheses within this thesis. The following chapter provided a more detailed discussion of the study results, as well as implications and future research.

## CHAPTER 5

### DISCUSSION

In the last few decades, prescription drug misuse has become a major element of public concern in the United States (Centers for Disease and Control Prevention, 2018). A 2018 Drug Enforcement Agency report revealed that drug poisoning is the current leading cause of death in our country. Increased rates of misuse has affected citizens of all ages, including juvenile populations (Substance Abuse and Mental Health Services Administration, 2018). Furthermore, research has revealed that the negative effects of prescription drug misuse are more prominent within rural communities (Ford, 2009; Pruitt, 2009; Havens, Young, & Havens, 2011; Monnat & Rigg, 2016; Pettigrew, Miller-Day, Krieger, & Hecht, 2012; Rhew, Hawkins, & Oesterle, 2011; Young, Havens, & Leukefeld, 2012). Despite these findings, little research exists regarding elements within socialization that may prevent or reduce misuse within juvenile population if specifically targeted. Additionally, understanding how socialization differs in regard to prescription drug misuse between rural and urban regions of the country could provide professionals better insight when creating anti-drug policy and programs. The current research intended to contribute to extant literature by assessing the differences of juvenile prescription drug misuse between rural and urban adolescents. This thesis specifically focused on elements of socialization derived from Hirschi's (1969) theory of social bonds as a guide for determining which protective factors to explore. These elements were analyzed in how they affect prescription drug misuse in both rural and urban youth.

Using data from the 2015 Monitoring the Future Survey, three logistic regression models were constructed to compare the effects of parental attachment, involvement in conventional activities, commitment to academics, and religiosity on prescription drug misuse. Model 1

provided a comparison of these variables to prescription drug misuse, and included the entire Monitoring the Future Survey sample of adolescents. Model 2 sought to examine how these variables affected juveniles in the rural sample, while Model 3 included only the urban sample of juveniles. The current chapter sought to discuss the findings of this study, as well as how each model compared to one another. This was done to answer the secondary research questions presented in Chapter Three. A discussion of policy implications, as well as direction for future research, were also presented within this chapter.

### **Findings**

The primary research question proposed within this study aimed to examine whether rural juveniles engaged in prescription drug misuse more than urban juveniles. Previous studies which measured the inappropriate use of prescription drugs discovered that juveniles in rural America more frequently misused these drugs than those in urban areas (Ford, 2009; Pruitt, 2009; Havens, Young, & Havens, 2011; Monnat & Rigg, 2016; Pettigrew, Miller-Day, Krieger, & Hecht, 2012; Rhew, Hawkins, & Oesterle, 2011; Young, Havens, & Leukefeld, 2012). This comparison however, had not yet been explored using Monitoring the Future Survey data. Simple frequencies were conducted to determine which sample claimed incidences of misuse more than the other. This analysis revealed that a greater percentage of juveniles in rural areas had claimed prescription drug misuse than those residing in urban areas.

This finding was in agreement with previous research, as well as the hypothesis presented in the current study. Keyes et al. (2014) attempted to identify factors unique to rural America that are potential contributors to the discrepancies in use. The first was a culture of “kinship” in these areas that create an intimate network for the diversion of personal medications. This was in reference to the idea that citizens of small towns are generally more familiar with those in their

communities. As a result, they are more knowledgeable of which individuals are legally prescribed medications, and would be willing to illegally distribute these substances. Another factor identified by Keys et al. (2014) was the surplus of prescriptions due to a large population of elderly and laborers who reside in these areas. The presence of these special populations have increased the availability of prescription drugs for diversion. The last two factors were described as the failing economic infrastructure of these areas, along with the out-migration of youth. Both of these elements have contributed to dying economies, which could be resolved by participating in the illegal drug trade (Keyes et al., 2014). Although a direct cause for this issue has yet to be identified, results from this thesis support the idea prescription drug misuse differs in rural America as compared to urban, even within populations of youth.

To gain a better understanding of juvenile prescription drug misuse, secondary research questions were explored. The first of these questions aimed to analyze the effect of parental attachment against prescription drug misuse. Hirschi's (1969) theory of social bonds emphasized that juveniles with strong attachments to their parents were the least likely to engage in delinquency. Two separate logistic regression models were constructed for rural and urban juveniles, and included variables related to parental attachment. *Satisfaction with parental relationship* and *importance of living close to one's parents* were measured against the likelihood that a prescription drug was used incorrectly in the previous year. Results showed that parental attachment acted as a significant protective factor for those in urban areas who valued their parental relationships. In rural areas, juveniles who expressed importance in living near their parents were also significantly less likely to engage in prescription drug misuse.

Importance of living close to one's parents, and the satisfaction of parental relationship, demonstrated the strongest protective effects on juveniles from prescription drug misuse within



this study. This finding aligns with Hirschi's (1969) claim that parental attachment is the most crucial element of socialization proposed within the theory of social bonds. Similar to Park, Melander, and Sanchez's (2016) study on rural Midwestern adolescents, the nationally representative sample of rural juveniles utilized within the current study were less likely to engage in prescription drug misuse when parental attachment was stronger.

Parental attachment as a protective social element in both rural and urban populations was not the expected finding for this secondary research question. Rural juveniles who had higher concerns of living close to their parents were less likely to have misuse drugs. This could be considered an indicator of a healthy parental relationship, which as Hirschi (1969) suggested, might act as a preventative factor for delinquency. Additionally, living close to one's parents may provide better sense of guardianship and supervision, limiting the availability of involvement in drug abuse. For urban juveniles, greater satisfaction with parental relationships decreased the likelihood of misuse. This could be a result of informal social control, as suggested by Hirschi (1969). The underlying fear of disappointing a parent might act as a significant deterrent from illicit use of prescription medications.

The next factor of socialization measured against prescription drug misuse was involvement in conventional activities. Hirschi's (1969) theory of social bonds stated that time spent in socially constructive activities eliminated time available for misconduct by juveniles. *The importance of recreation and number of days a week that one spent on hobbies and recreation* were measured against the dependent variable of prescription drug misuse. Analysis of this relationship presented evidence that keeping adolescents engaged in lawful activities did not directly protect them from prescription drug misuse in neither rural nor urban areas.

This outcome did not support findings in a number of previous studies (Moore et al., 2010; Park, Melander, & Sanchez, 2016; Thiede, Lichter, & Slack, 2018). In urban areas, it appeared that as juveniles spent more time on recreation throughout the week, their likelihood of misusing prescription drugs increased. While the involvement in recreation and hobbies may be more available to this population of juveniles, involvement in these activities may not be sufficient in forming social bonds that are strong enough to prevent delinquency. Since type of activity was not specified within the Monitoring the Future Survey variable, it is likely that these juveniles were involved in unstructured activities. Recreation may be interpreted differently by the study participant, including going out for recreational drug use with peers. Lilly, Cullen, and Ball (2015) suggested that involvement in conventional activities may only prevent delinquency if there is structure and supervision. Without structure, juveniles are unable to form positive social bonds, and be deterred from the consequences of criminal activities.

In the rural sample, importance of recreation and number of outings a week did not significantly protect from, or contribute to, prescription drug misuse. As previously stated by Thiede, Lichter, and Slack (2018), access to conventional activities is limited in rural America. The results of the current study may be attributed to the lack of conventional activities in these areas, which in turn failed to provide a protective or contributive effect on drug misuse. Since likelihood of misuse did not increase or decrease with the increase of recreation, it can be assumed that recreation is not a significant part of rural life. Park, Melander, and Sanchez (2016) previously found that when legal recreational activities were available to rural youth, their likelihoods of misusing prescription drugs decreased. Findings from the current study may allude to the fact that not enough structured activities are available for urban juveniles nationwide.

The next secondary question explored in this study sought to measure the effect of

commitment to academics on prescription drug misuse. In Hirschi's (1969) theory, commitment to conventional values, such as academic achievement, reduced the likelihood for involvement in illegal activities. *Likelihood of furthering education, frequency of understanding schoolwork, and seeing school as an enjoyable experience* were assessed against the likelihood that the juvenile would have engaged in prescription drug misuse within the previous year. Results from analysis of the logistic regression models were not supportive of previous research (Jenkins, 1997; Ford, 2009; Park, Melander, & Sanchez, 2016; Shears, Edwards, & Stanley, 2006).

In rural areas, variables used to measure academic commitment demonstrated that as commitment to academics increased, so did the likelihood of prescription drug use. Although the true nature of this relationship cannot be presumed from this study alone, previous research points to the fact that quality of education in rural America is currently lacking (Havens, Young, & Havens, 2011; Pruitt, 2009). Academic stress has been linked to the illicit use of prescription medications for the purpose of improving mental focus (DeSantis, Webb, & Noar, 2008). Using a prescription drug without a personal prescription may be more appealing for students who desire to achieve academically, but are not receiving adequate education, and are experiencing high levels of stress. With a surplus of prescription drug availability in rural areas (Keyes et al., 2014), students who are invested in their academic futures may feel the need to dabble in psychologically enhancing drugs to succeed in a setting that does not fully prepare them for their educational goals. These juveniles may also perceive illicit use of prescription medication as an acceptable aid for academic performance, and not as an illegal action. Future research outside the scope of this study may be able to reveal more information concerning this unexpected relationship, as well as why this element of social bonds was not in support of Hirschi's (1969) element of commitment.

In the urban sample, commitment to academics did not have a significant effect on misuse. This social bond may not have acted as a significant protective or contributive factor within this population due to perceptions of prescription drug misuse. Hirschi's (1969) social bond of commitment specified that the fear of losing a stake in conformity is what deterred juveniles from delinquency. It is possible that urban juveniles are not deterred from misuse in fear of losing a stake in conformity through education because they do not view misusing prescription drugs as a serious act of criminality. The DEA's (2018) annual threat assessment suggested that heroin, cocaine, and methamphetamine use and availability has remained constant across all age groups in the U.S. In urban areas, it is possible that these juveniles do not see using legal medications without a personal prescription as seriously as abusing illicit street drugs.

The final secondary question proposed within the current research aimed to examine how religiosity was linked to the likelihood that a juvenile would have engaged in prescription drug misuse within the previous year. In Hirschi's (1969) theory, belief in a conventional system was argued to be a protective factor against juvenile delinquency. *Importance of religion to one's life* and *attendance of religious services* were used as the variables measured against prescription drug misuse. Comparison of the urban and rural logistic regression models revealed that being involved with religion did not act as a significant protective factor against juvenile prescription drug misuse in either region. Results of the current study did not find support for Hirschi's (1969) theory.

The ineffectiveness of religiosity on preventing prescription drug misuse in rural areas was not hypothesized in the current study. In rural America, religious-type services and gatherings are an important part of rural living regardless of morality (Azzi & Ehrenberg, 1975). A possible explanation for this finding could be that attendance of religious activities is more

closely associated with the obligatory tradition of attendance, rather than support of a conventional belief system. Additionally, Hirschi's (1969) theory of social bonds states that delinquency is prevented through the element of belief only when the action goes against moral guidelines. Since prescription medications are technically legal substances, using them without a prescription may not be perceived as an illegal act or an abuse of drugs. For both rural and urban juveniles, religiosity may not have acted as a protective factor if attitudes surrounding misuse were not specifically condemned by their religious beliefs.

As addressed throughout this study, little is currently known about factors that influence prescription drug misuse within rural adolescent populations. This study intended to provide new information regarding interactions between socialization factors and juvenile misuse of prescription medication. Understanding how protective factors differ among youth in different regions of the United States is essential in the development of effective policies and programs for drug prevention. To-date, anti-drug programs have shown ineffective results in minimizing the effects of the prescription drug epidemic (Wunsch, Nakamoto, Behonick, & Massello, 2009). Using a one-size-fits-all approach has failed to account for factors unique to rural America. Policy implications intended to target prescription drug misuse utilizing the information gathered within this study was further discussed in the following section.

### **Policy Implications**

Three major policy implications were identified within the current study. These were: (1) strengthening parental bonds as a method of preventing prescription drug misuse within juvenile populations, (2) providing schools in rural America with improved resources for academic achievement, and (3) identifying possible approaches to prescription drug misuse that targets

different regions of the United States. The suggestion of these implications were based on the analysis results of the current research as well as relevant information found in previous studies.

Attachment to one's parents was identified as the strongest protective factor against juvenile prescription drug misuse examined within this study. Following Hirschi's (1969) logic that juveniles who have a stronger sense of attachment to their parents are less likely to engage in delinquency, strengthening these bonds could assist in preventing future prescription misuse. The subfield of biosocial criminology has suggested that strengthening parental bonds beginning at conception should continue into early development (Beaver, 2009). Using these methods of parental bonding beyond childhood and into young adulthood could potentially influence juvenile behavior, and decrease the chance of prescription drug abuse. Drug prevention programs, such as Drug Abuse Resistance Education (D.A.R.E.) could implement parental involvement in educating guardians about the dangers of prescription drug misuse, signs that their child is partaking in misuse, or methods for coping with misuse within the family.

An unexpected finding within this study was the relationship between commitment to academics and prescription drug misuse within rural adolescents. Study participants in rural areas who claimed higher levels of commitment to academics also appeared more likely to have engaged in prescription drug misuse. This relationship was not observed in the urban sample of juveniles in this study, which may be due to the differences between the quality of education in each region. Rural areas lacking in academic support for their adolescents could potentially contribute to inappropriate use of prescription medications as an aid for improved academic performance. Previous research has linked academic stressors to the use of mental enhancement drugs, such as Adderall, without a personal prescription (DeSantis, Webb, & Noar, 2008). Measures intended to improve education in rural settings, including improved curriculums, new

academic materials, and greater focus on college or trade school preparation, could remove the obstacles faced by youth in these areas. Additionally, education on coping mechanisms could work to relieve some of the stress involved with obtaining academic success. Doing so may eliminate the need for drug diversion and inappropriate consumption of pharmaceuticals in rural America.

Finally, results from this study revealed that differences in socialization exist between rural and urban juveniles in regard to prescription drug misuse. In developing anti-drug program and policies, professionals should account for these differences in each region of the country. Instead of implementing a one-size-fits-all approach to drug prevention, program developers should consider research that explains how juveniles respond to protective factors. Other studies have explored how attitudes toward particular substances in rural areas (Gundy, 2006), origins of supply (Pettigrew, Miller-Day, Krieger, & Hecht, 2012), and onset of use (Young, Havens, & Leukefeld, 2012) differ between the two populations of juveniles. By addressing all of these concerns individually while considering for differences in rural and urban youth socialization, drug-prevention programs could assist in reducing rates of misuse within the United States.

### **Future Research**

The current study suggested that being strongly attached to one's parents provides some level of protection against the choice to misuse prescription drugs. While this information provides insight into the dynamic nature of juvenile drug use, future research on this topic is still necessary. The use of a secondary database, such as the Monitoring the Future Survey in the current study, provided an immediate analysis of a large sample of data. It did so by reducing the time it would have taken for primary data collection. This method of research, however, does not allow for the tailoring of research variables. Research questions were pre-written by the

developers of the Monitoring the Future Survey. The current study selected variables out of this database which best fit purpose of this study. Future research should further analyze the relationships between socialization and prescription drug misuse. Using a quantitative survey analysis with variables tailored specifically to measuring Hirschi's (1969) four social bonding elements of attachment, involvement, commitment, and belief would provide a more telling conclusion of whether or not these elements are significant in preventing prescription drug misuse.

The variables used to measure involvement in conventional activities did not specify what types of conventional activities the study participants engaged in. Results of the current study revealed that urban juveniles who frequently engaged in recreation and hobbies were at greater odds for engaging in prescription drug misuse. An explanation for this phenomenon was out of scope for this study, but it provided direction into future exploration. Providing juveniles with activities for involvement may not be effective in preventing prescription drug misuse if there is no insight into which activities provide the strongest preventative outcomes. Future research could focus on how specific activities, such as sports or extra-curricular clubs, work to prevent or attribute to prescription drug misuse.

Lastly, this thesis provided evidence that socialization factors vary between rural and urban juveniles in regard to prescription drug misuse. Factors unique to rural areas are often disregarded in the development of juvenile anti-drug programs implemented throughout the U.S. (Botvin, 2000; Wunsch, Nakamoto, Behonick, & Massello, 2009). While some studies have provided possible explanations for excessive rates of prescription drug misuse in rural American adults (Keyes et al., 2014; Leukefeld, Walker, Havens, Leedham, & Tolbert, 2007; Wood, 2015), research into rural juveniles is lacking. A quantitative analysis may not be able to fully grasp the



unique factors of rural life in America. For this purpose, future research should utilize a qualitative approach to exploring factors that could be linked to prescription drug misuse. Understanding the integral causes of prescription drug misuse, and how they differ throughout various regions of the United States, may provide anti-drug program developers a better understanding of how to relieve the current upsurge in prescription drug misuse.

### **Conclusion**

Prescription drug misuse has been considered a major subject of public concern in the United States over the last several decades (Drug Enforcement Administration, 2018). Previous research has indicated that juveniles who reside in rural areas of the U.S. are at a significantly higher risk of becoming prescription drug misusers than their urban counterparts (Ford, 2009; Havens, Young, & Havens, 2011; Monnat & Rigg, 2016; Pettigrew, Miller-Day, Krieger, & Hecht, 2012; Pruitt, 2009; Rhew, Hawkins, & Oesterle, 2011; Young, Havens, & Leukefeld, 2012). Despite these findings, limited research exists regarding factors that contribute to this phenomenon in rural adolescents, and how they differ from urban youth. This thesis sought to better understand the dynamic nature of prescription drug misuse between rural and urban adolescents. Using Hirschi's (1969) theory of social bonds as a theoretical guide, parental attachment, involvement in convention activities, commitment to academics, and religiosity were analyzed for their effects on prescription drug misuse. Results from this study supported the notion proposed by Hirschi (1969) that juveniles who demonstrate greater parental attachment were less likely to engage in deviant behavior, specifically misusing prescription medication. Additionally, a number of the elements examined within this study trended in the opposite expected direction, such as urban involvement in conventional activities and rural commitment to academics, which both increased the likelihood for prescription drug misuse. It is also

important to note that differences in socialization factors were present between rural and urban youth included in the research. While commitment to academics acted as a contributor to prescription drug misuse within the rural population, it appeared to be a protective factor in the urban. An increase in number of outings in a week strongly contributed to misuse in urban juveniles, but it was not statistically significant within the rural population.

Policy implications of this study include efforts to strengthen parental attachment, and improvement of education in rural America. Policymakers also have the potential to utilize this study, along with others (Atav & Spencer, 2002; Botvin, 2000; Ford, 2009; Havens, Young, & Havens, 2011; Keyes, Cerda, Brady, Havens, & Galea, 2014), when developing programs for preventing prescription drug misuse in juveniles from different regions across the United States. Future research efforts should focus on socialization factors that differ between rural and urban juveniles. The tailoring of research questions, or the use of a qualitative study design, would allow for a more precise examination of the differences in socialization that are related to prescription drug misuse.

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