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Mediators and Moderators of the Associations between Unstructured Socializing with Peers, Substance Use, and Handgun Carrying among Adolescents

Anna Leimberg
Florida International University, aleimber@fiu.edu

FLORIDA INTERNATIONAL UNIVERSITY

Miami, Florida

MEDIATORS AND MODERATORS OF THE ASSOCIATIONS BETWEEN UNSTRUCTURED SOCIALIZING WITH PEERS, SUBSTANCE USE, AND HANDGUN CARRYING AMONG ADOLESCENTS

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Anna Leimberg

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To: Dean John F. Stack
Steven J. Green School of International and Public Affairs

This dissertation, written by Anna Leimberg, and entitled Mediators and Moderators of the Associations between Unstructured Socializing with Peers, Substance Use, and Handgun Carrying Among Adolescents, having been approved in respect to style and intellectual content, is referred to you for judgment.

We have read this dissertation and recommend that it be approved.

_____
Jacqueline R. Evans

_____
Tim Goddard

_____
Carleen Vincent-Robinson

_____
Ryan C. Meldrum, Major Professor

Date of Defense: March 26, 2021

The dissertation of Anna Leimberg is approved.

_____
Dean John F. Stack, Jr.
Steven J. Green School of International and Public Affairs

_____
Andrés G. Gil
Vice President for Research and Economic Development
and Dean of the University Graduate School

Florida International University, 2021

DEDICATION

I dedicate this dissertation to my mother and father, Svetlana and Mikhail Leimberg, who first taught me the value of hard work and the importance of education, and who stood by and supported me through this incredible journey.

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ABSTRACT OF THE DISSERTATION

MEDIATORS AND MODERATORS OF THE ASSOCIATIONS BETWEEN UNSTRUCTURED SOCIALIZING WITH PEERS, SUBSTANCE USE, AND HANDGUN CARRYING AMONG ADOLESCENTS

by

Anna Leimberg

Florida International University, 2020

Miami, Florida

Professor Ryan C. Meldrum, Major Professor

This dissertation seeks to provide an important addition to previous research on unstructured socializing with peers, adolescent substance use, and handgun carrying while also adding to future policy by providing new avenues by which to better identify the predictors of drugs use and handgun carrying.

The study contributes to knowledge in four ways. First, identifying variables that moderate and/or mediate the association between unstructured socializing and substance use and handgun carrying have theoretically relevant implications. Second, using a fine-grained measure of unstructured socializing with peers provides more precise results and greater insight for the line of research focusing on gender differences and time spent in unstructured activities among adolescents, and the risk that this poses for substance use and handgun carrying. Third, this research brings public awareness to the issues surrounding substance use and handgun carrying, provides a means to further understand the issues, and aids in future opportunities to remedy the problems. Last, understanding

the relationship between unstructured socializing and substance use and handgun carrying can result in policy relevant implications, and can lead to intervention and prevention strategies that will decrease substance use, handgun carrying, and possibly even gun violence among adolescents.

Data for this study come from the 2018 Florida Youth Substance Abuse Survey (FYSAS). The FYSAS is a recurrent cross-sectional survey of public middle-school and high-school students in the state of Florida conducted annually since the 1999-2000 school year. The FYSAS includes items that enable the construction of mediating and moderating variables such as, ease of access, gender, bonds with parents, bonds at school, and neighborhood disorder. This data also allows for the consideration of a wide range of covariates that are correlated with unstructured socializing, substance use, and handgun carrying.

The results indicate that the (1) effect of unstructured socializing with peers on drug use and handgun carrying are partially mediated by ease of access, (2) the effect of unstructured socializing on soft drug use significantly varies by gender, (3) the effect of unstructured socializing on soft drug use significantly varies by levels of adolescent bonds with parents and levels of school bonds, and (4) the effect of unstructured socializing on handgun carrying significantly varies by neighborhood disorder.

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ABBREVIATIONS AND ACRONYMS

Florida Youth Substance Abuse Survey	FYSAS
Unstructured Socializing with Peers	USWP

CHAPTER 1

I. INTRODUCTION

Researchers have devoted significant attention to empirically validating the routine activity perspective and its ability to explain the relationship between opportunity and crime (Lotz & Lee, 1999; Reyns, Henson & Fisher, 2011). Building upon the initial statements of routine activity theory that established a relationship between the variations of guardianship, availability of suitable targets, and their connection to victimization (Cohen & Felson, 1979), Osgood and colleagues (1996) proposed a new rationale that focused attention on offender motivation and its situational nature in regard to crime (Anderson & Hughes, 2009). Their logic suggested that opportunities for deviance, especially among adolescents, are most prominent in settings related to those defined by unstructured socializing with peers[1] (Anderson & Hughes, 2009; Osgood et al., 1996).

In an effort to test the application of routine activity theory as proposed by Osgood and colleagues (1996), other scholars investigated the relationship between unstructured socializing with peers and deviant behavior. Criminologists have extensively studied this relationship to expand the body of research examining the association between unstructured socializing with peers and delinquency among adolescents (Augustyn & McGloin, 2013; Bernburg & Thorlindsson, 2001; Haynie & Osgood, 2005; Hoeben, Meldrum, Walker, & Young, 2016; Osgood & Anderson, 2004). Across numerous studies, researchers have found support for unstructured socializing with peers contributing to adolescent involvement in a wide variety of delinquent behaviors such as

[1] Hereinafter referred to as USWP.

theft, violent offending, property crime, and substance use (Anderson & Hughes, 2009; Bernburg & Thorlindsson, 2007; Flannery, Williams & Vazsonyi, 1999; Gage, Overpeck, Nansel, & Kogan, 2005; Miller, 2013; Thorlindsson & Bernburg, 2006; Vazsonyi et al., 2002; Wallace & Bachman, 1991; Warr, 1998; Wong, 2005).

Although a considerable amount of research has been devoted to investigating the relationship between unstructured socializing with peers and delinquency, far less attention has been devoted to examining the mediators[2] and moderators[3] of this relationship, especially pertaining to the outcomes of substance use and handgun carrying. Previous research has examined the effects of self-control and impulsivity (LaGrange & Silverman, 1999; Hay & Forrest, 2008; Thomas & McGloin, 2013), peer delinquency (Bernburg & Thorlindsson, 2001; Svensson & Oberwittler, 2010; Wikström et al., 2012), and parenting-related variables (Bernburg & Thorlindsson, 2007; Galambos & Maggs, 1991) and how they mediate and/or moderate the unstructured socializing with peers-delinquency relationship. However, potential mediating and moderating factors such as perceived ease of access to drugs and weapons, gender, bonds with parents and school, and neighborhood disorder have not been as thoroughly considered. Thus, examining these variables with greater specificity would enhance our understanding about why involvement in unstructured socializing increases delinquency, and why it increases substance use and handgun carrying, an explanation that is currently lacking in

[2] Mediating variables help explain the relationship between an independent and dependent variable.

[3] Moderating variables modify the relationship (changes strength or direction) between an independent and dependent variable.

previous literature. In addition, this research would also result in important theoretical and policy-relevant implications that may aid in the effort to help reduce these behaviors and encourage a more safe and prosocial transition of youth as they navigate from adolescence into adulthood.

1.1 Research on Substance Use

The National Center on Addiction and Substance Abuse (2011) has identified adolescent substance use as one of America's top public health concerns—highlighting that, by the time they are in high school, three-fourths of students have engaged in at least one form of substance use, with almost half of students being current users, and one in eight meeting diagnostic criteria for a substance use disorder (National Center on Addiction and Substance Abuse, 2011). Given the high rates of substance use among youth, it appears that tobacco, alcohol, and other drugs may be readily available and easily accessible to many middle and high school students. In fact, the ease of access to tobacco, alcohol, and certain illicit drugs has been recognized as one of the main underlying causes of the current substance use epidemic among America's youth, with adolescents' perceptions of the ease of access to alcohol, tobacco, and drugs being shown to significantly increase their risk for use (Warren, Smalley & Barefoot, 2015).

Given the magnitude of substance use behaviors and the perceived ease of access to alcohol, tobacco, and illicit drugs among middle and high school students, researchers have begun to explore sources of access and other factors that may impact ease of access to substances among students in order to better inform prevention and intervention efforts. In terms of sources of access, research consistently demonstrates that the most reported source by which adolescents perceive that they could gain access to substances

is through friends and/or social networks (Warren, Smalley & Barefoot, 2015). This idea of peers being the most liable sources in helping gain access to substances is especially significant to this study. As mentioned above, previous research has established a positive association between unstructured socializing and substance use, as peers are often key to introducing their friends and other adolescents to different substances as a method of altering perceptions, seeking adventure, and passing time (Baron, 2010). Thus, it is pertinent to further investigate this relationship in future research.

1.2 Research on Handgun Carrying

One of the leading causes of mortality among youth in the United States is deaths attributable to firearms (Centers for Disease Control and Prevention, 2016; Simon, Richardson, Dent, Chou & Flay, 1998; Vaughn, Perron, Abdon, Olate, Groom & Wu, 2012). Given the lethality of interpersonal disputes when handguns are present, coupled with the diminished maturation of executive decision-making[4] common in young people, handgun carrying among adolescents is a serious public health and policy concern (Barry, McGinty, Vernick, & Webster, 2015; Blum, 2001; Braga, 2012; Fowler, Dahlberg, Haileyesus, & Annest, 2015; Kleck, 2015; Muula, Rudatsikira, & Siziya, 2008; O'Toole & Fondacaro, 2017; Siegel et al., 2014; Vaughn, Salas-Wright, Boutwell, DeLisi & Curtis, 2017; Welsh, Braga, & Sullivan, 2014).

Research suggests that the correlates of gun violence might be similar to the predictors of other serious violence. Such correlates include peer delinquency, gang membership, involvement in risky social networks, early externalizing problems, and

[4] The ability to make well-informed decisions by critically thinking about the problem, gathering all of the information, weighing the options, and selecting the best possible route.

living in disadvantaged neighborhoods (Beardslee, Docherty, Yang & Pardini, 2019; Vaughn, Perron, Abdon, Olate, Groom & Wu, 2012; Lizotte, Krohn, Howell, Tobin & Howard, 2000; Wilkinson & Fagan, 2001). However, the relationship between unstructured socializing and its effects on handgun carrying are not well established. Although peer delinquency and peer influence have been linked to handgun carrying and gun violence (Pyrooz, Turanovic, Decker & Wu, 2016), the association between unstructured socializing and handgun carrying has only been seldomly established (Meldrum, Jackson, Zgoba & Testa, 2020).

Consistent with the routine activity perspective, children who spend a significant amount of time with peers, particularly delinquent peers, in unstructured settings are at a higher risk for delinquent behavior, such as handgun carrying (Apel, 2004). However, a necessary precondition for weapon carrying is having ready access to a weapon, a concept that is of great importance to the focus of the current study. For weapon carrying, adolescents must first have the opportunity to obtain weapons. At least in the United States, access to knives and even firearms does not seem to be a high hurdle (Sorenson & Vittes, 2004; Vaughan et al., 1996; Vaughn, Perron, Abdon, Olate, Groom & Wu, 2012).

Weapon carrying is driven by several motivations, with the most prominent reason for weapon carrying suggested in the literature is to be part of a delinquent lifestyle, which may stem from time sent with peers (Dijkstra, Lindenberg, Veenstra, Steglich, Isaacs, Card & Hodges, 2010). Weapon carrying has been related to different problem behaviors, such as delinquency, aggression, and vandalism, as well as the use of cigarettes, alcohol, and drugs (Bailey, Flewelling, and Rosenbaum, 1997; Dijkstra,

Lindenberg, Veenstra, Steglich, Isaacs, Card & Hodges, 2010; Kingery, Coggeshall, and Alford, 1999).

In criminological research, the study of peer influence suggests that socialization in peer groups emerges from the imitation of behavior, and peers who carry weapons serve as role models for this behavior, which in turn affects attitudes and perceived norms among peers (Bailey, Flewelling, and Rosenbaum, 1997; Myers et al., 1997). This modeling process suggests that the influence of peers coupled with opportunity will be a major factor in the ease of access to a weapon, the proliferation of handgun carrying among adolescents, and intervention efforts for reducing these behaviors.

1.3 Limitations of the Current Research

Researchers have found significant links between unstructured socializing with peers, general delinquency, property offending, and violent crime. However, various aspects of the relationship between unstructured socializing with peers, substance use, and handgun carrying remain largely unexplored. Specifically, though some attention has been directed at investigating potential moderators and mediators of the relationship between unstructured socializing with peers and general delinquency, less attention has specifically focused on substance use and handgun carrying as outcomes of unstructured socializing with peers and the manner in which certain individual theoretical variables mediate or moderate these associations. Thus, more attention needs to be directed towards the examination of relevant mediators and moderators that have not been properly examined in previous research pertaining to unstructured socializing with peers. Essentially, not only will this research reveal patterns that can inform innovative intervention programming to address adolescent substance use and handgun carrying, but

it can also result in the reduction of violent offenses being committed due to drugs or handguns, such as school shootings.

Additionally, previous research has established that the association between unstructured socializing and delinquency holds across both male and female samples (Augustyn & McGloin, 2013; Barnes et al., 2007; Gage et al., 2005). However, some findings remain unclear, with some studies suggesting that: (1) the effect of unstructured socializing on delinquency is stronger for males than for females, (2) others indicating the relationship is stronger for females, and (3) still others finding that both females and males derive similar risk from unstructured socializing. These inconsistent findings may be due to the fact that previous measures of unstructured socializing with peers failed to accurately capture the three components of the variable, only addressed times per week (e.g., not at all, once a week, 2-3 times, and 5 or more), and did not divide the variable into hourly increments (Augustyn & McGloin, 2013).

Moreover, given the large volume of studies that have supported the link between unstructured socializing and delinquency, it is not surprising that researchers have devoted significant attention to specifying the conditions under which the effect of unstructured socializing on delinquency is either amplified or diminished. For example, previous research has examined how levels of self-control moderate the relationship between unstructured socializing with peers and delinquency (LaGrange & Silverman, 1999; Hay & Forrest, 2008; Thomas & McGloin, 2013). Other variables that have been considered as potential moderators are school bonds, familial instability, peer delinquency, neighborhood characteristics, extracurricular activities, and strain (Bernburg & Thorlindsson, 2001; Bernburg & Thorlindsson, 2007; Janssen, Weerman &

Eichelsheim, 2017; Op de Beeck & Pauwels, 2010). Such variables, however, have not been widely examined as moderators of the association between unstructured socializing and both substance use and handgun carrying. Additionally, studies that have sought to explain the unstructured socializing–substance use relationship have had a tendency to focus on only alcohol and marijuana rather than the broader range of substances that exist and foster the potential for abuse by adolescents (Augustyn & McGloin, 2013; Flannery, Williams & Vazsonyi, 1999; Miller, 2013). Thus, further exploring this line of research can bring significant understanding and awareness into the realm of policy associated with adolescents getting injured, getting into trouble, and getting arrested.

Previous research has seldom focused on mediation of the unstructured socializing–substance use and unstructured socializing–handgun carrying relationships (Hoeben & Weerman, 2016). Yet, it is important to investigate the mediating effects of the easiness of access to substances and handguns when considering this relationship. Examining the mediating effects of the easiness of access to substances and handguns can bring meaningful insight for the unstructured socializing, substance use, and handgun carrying relationships, and is essential to future policy-making in regards to substance use and handgun related offending among adolescents.

1.4 The Current Investigation

This study seeks to provide an important addition to previous research on unstructured socializing with peers, adolescent substance use, and handgun carrying while also adding to future policy by providing new avenues by which to better identify the predictors of drug use and handgun carrying.

The proposed study contributes to knowledge in four ways. First, identifying variables that moderate and/or mediate the association between unstructured socializing and substance use and handgun carrying can have theoretically relevant implications. The findings also have the potential to reduce substance use, handgun carrying, and violence that can stem from each. Second, using a more fine-grained measure of unstructured socializing with peers would provide more precise results and greater insight for the line of research focusing on gender differences and time spent in unstructured activities among adolescents, and the risk that this poses for substance use and handgun carrying. Third, this research can bring public awareness to the issues surrounding substance use and handgun carrying, provide a means to further understand the issue, and aid in future opportunities to remedy the problem. Last, understanding the relationship between unstructured socializing and substance use and handgun carrying can result in policy relevant implications, and can lead to intervention and prevention strategies that will decrease substance use, handgun carrying, and possibly even gun violence among adolescents.

1.5 Overview of Chapters

The proceeding chapters are arranged as follows. Chapter two provides an overview of theory and research on the relationship between unstructured socializing with peers, substance use, and handgun carrying. Additionally, chapter 2 will elaborate on the arguments originally made by Osgood et al. (1996), patterns and predictors of substance use, and patterns and correlates of weapon/handgun carrying. Chapter three details the hypotheses and research questions, while Chapter four provides the data and methods

used in the study, which came from the 2018 Florida Youth Substance Abuse Survey (FYSAS).

Chapters five through seven consist of three independent empirical studies, each of which contain reviews of prior theory and research relevant to the particular topic under investigation. Chapter five examines how the easiness of access to substances and handguns mediates the association between unstructured socializing with peers and drug use, and unstructured socializing with peers and handgun carrying. Chapter six shifts the focus of the investigation to gender differences in the effect that unstructured socializing with peers has on substance use and handgun carrying among adolescents. Chapter seven examines the factors, other than gender, that moderate the relationship between unstructured socializing with peers and both substance use and handgun carrying, something that previous research has only recently begun to shed light upon. The specific moderators focused upon are bonds with parents, bonds at school, and neighborhood disorder.

The study concludes with chapter eight, which summarizes the main findings of each of the empirical chapters, discusses the implications for theory, policy, and programing, limitations of this study, and discusses avenues for future research on the unstructured socializing, substance use, and handgun carrying relationships.

CHAPTER 2

II. UNSTRUCTURED SOCIALIZING, SUBSTANCE USE, HANDGUN CARRYING, AND CRIMINOLOGICAL THEORY

This chapter will explain the origins and importance of routine activity theory, elaborate on the arguments originally made by Osgood et al. (1996), describe the patterns and predictors of substance use, and patterns and correlates of weapon/handgun carrying. The explanation of the routine activity framework is important because it supports the development of the concept of unstructured socializing with peers, which is the primary theoretical perspective utilized in this dissertation. It is also important to provide a description of the patterns and correlates of substance use and handgun carrying as this helps to better elucidate their association with unstructured socializing, and more so, how they can become a product of unstructured socializing.

2.1 Routine Activity Theory

In the last few decades, theories that explain how situation and opportunity can lead to crime have advanced in their significance within the field of criminology. The opportunity perspective is centered around a premise that recognizes some situations are more suitable for crime to occur than others. These theories conceptualize crime as a product of the daily activities of individuals, and their convergence with the social and physical structures that surround them. Collectively, these components generate opportunity for criminality, and in turn, create patterns of crime that are disseminated non-randomly through space and time (Miller, 2013).

Over time, various types of opportunity theories have surfaced, specifically, ones that are referred to as “theories of victimization.” These theories emphasize the

characteristics and activities of individuals that contribute to their victimization (Birkbeck and LaFree, 1993). The most commonly known theory of victimization is Cohen and Felson's (1979) routine activity theory, which provides a fundamental groundwork for most victimization perspectives that attest to how individuals contribute to their own victimization (Birkbeck and LaFree, 1993).

Cohen and Felson (1979) argued that predatory crime occurs when a motivated offender meets a suitable target in the absence of a capable guardian. They explained that the patterns of daily life, and the ‘‘routine activities’’ they involve, affect the chances of these factors converging in space and time to produce crime. Cohen and Felson's theory has been used to explain variations in group patterns of victimization (Jensen and Brownfield 1986; Maxfield 1987; Sampson and Wooldredge 1987; Tseloni et al. 2004) and crime rates (Bennett 1991; Messner and Blau 1987; Roncek and Maier 1991), but used far less to explain individual offending, which makes sense considering that it is a macro-level theory.

Routine activity theory illustrates how victimization rates can be a product of the interaction of potential targets and motivated offenders. According to the theory, risk factors for victimization include exposure, guardianship, and attractiveness. Cohen and associates (1981) define exposure as "the physical visibility and accessibility of persons or objects to potential offenders at any given time or place (p. 507)," guardianship as "the effectiveness of persons or objects in preventing violations from occurring (p. 508)," and attractiveness as "the material or symbolic desirability of persons or property targets to potential offenders (p. 508)."

The main argument of the routine activity theory is that targets are more likely to be victimized when they are attractive, less guarded, and exposed to motivated offenders with greater frequency (Birkbeck and LaFree, 1993). Earlier assessments of the theory in studies explaining personal and property crime have reported confirmatory findings and support for explaining victimization based on a situational model of offender behavior (Cohen and Felson 1979; Cohen et al. 1980, Cohen et al. 1981, Maxfield 1987). However, the routine activity theory was far less effective in explaining offending at the individual level. Osgood and colleagues (1996) proposed a new variation of the routine activity theory in order to attempt to bridge this divide. They adapted Cohen and Felson's (1979) routine activity theory and introduced the routine activity theory of general deviance (Miller, 2013).

In this new framework, Osgood et al. (1996) reformulate the three elements of the routine activity theory. They assume that the motivation for deviant behavior resides in the nature of the behavior rather than the "motivated offender." With regard to delinquency, they explain that the problem is the situation, not the person (Briar and Piliavin, 1965). Further, they propose that unstructured activities give more time for deviance because there is more room for risk-taking behavior. In their reformation of the theory, they also suggest that the "suitable target" is substituted with circumstances in which misbehavior is encouraged, such as time spent with peers. Lastly, the third component of the routine activity theory is substituted with the idea that a person will commit a crime when there is no adult to curb their behavior. In particular, Osgood et al. (1996) assigned the term "handlers" to the persons whose position in a situation includes the obligation to exercise social control in response to deviance. Thus, originating from

Osgood et al.'s (1996) routine activity of general deviance, certain conditions are seen as more conducive to deviant actions, and are more likely to arise among teenagers engaging in day-to-day activities.

Furthermore, within their theory, they establish the idea of unstructured socializing with peers, which focuses on explaining individual offending. They argue that unstructured socializing with peers in the absence of authority figures represents the principal routine activity associated with general deviance (Osgood et al., 1996). They explain that peers may be the source of drugs, offer encouragement during a physical altercation, or assist in being a lookout, while simultaneously reinforcing deviance; the lack of an authority figure willing to address deviant behaviors makes the behavior more probable; and, unstructured activities provide more time for deviance because they lack individuals that can be held accountable for social control (Miller, 2013).

Osgood and colleagues (1996) tested the validity of their theory by employing five ways of longitudinal self-report data for 18-26-years-olds and found that the use of substances and alcohol, dangerous driving, and other forms of general delinquency were most associated with riding around in a car for fun, getting together with friends informally, going to parties, and spending evenings out for fun and recreation (Osgood et al., 1996). The seminal work conducted by Osgood et al. (1996) is of central importance to this dissertation, and given the transformation of routine activity theory that they offer, the concept of unstructured socializing with peers warrants discussion in greater detail.

2.2 Unstructured Socializing in the Criminological Literature

As an extension of the routine activity theory, Osgood and colleagues (1996) shifted the focus of the theory from victimization to include individual offending and

opportunities for deviance. They introduced the concept of unstructured socializing with peers, which they identified as being comprised by three criteria: (1) time spent with peers, (2) the absence of authority figures, and (3) having no agenda on how time is spent (Osgood et al., 1996).

Osgood et al. (1996) argue that unstructured socializing with peers increases the risk of deviance and substance use for two reasons. First, structured activities that entail a specific agenda, place individuals into a setting that enforces restraint and social control, something that unstructured socializing lacks. For example, individuals who engage in after-school activities, such as sports, are surrounded by coaches and instructors who uphold the structure in that particular setting and, in turn, minimize the opportunity to engage in deviant behavior. Second, structured activities provide a decreased likelihood of involvement in criminality. They do so by limiting the amount of time peers spend together in unsupervised settings, which can "increase the situational potential for deviance by making deviance easier and rewarding" (Osgood et al., 1996, p. 639).

As noted above, in their seminal study, Osgood and colleagues (1996) focused on using unstructured socializing to explain deviant behavior such as dangerous driving, the use of alcohol, marijuana, and other illicit drugs. They presented substantial evidence that unstructured socializing does indeed foster the opportunity for criminal behavior by establishing that there was a positive correlation between all unstructured socializing activities and criminal behavior (Osgood et al., 1996). Given the extensive research conducted on the effects of unstructured socializing with peers that followed the work of Osgood and colleagues (1996), the details of previous studies are reviewed in the following section.

I. Effects of Unstructured Socializing with Peers

i. General Delinquency

Expanding on Osgood and colleagues' (1996), scholars and researchers began testing the concept of unstructured socializing with peers and its relationship to deviant behavior. Unstructured socializing has been correlated with a wide range of delinquent behaviors, but, most commonly, associations have been identified with general delinquency. According to Hoeben and Weerman (2016), involvement in unstructured socializing is linked to delinquency for at least three important reasons: 1) Youth are exposed to delinquent friends in circumstances of unstructured socializing, 2) exposure to delinquent peers influences the degree to which adolescents interpret temptations to participate in delinquent behavior, and 3) engagement with delinquent peers impacts youths' open-mindedness towards delinquent behavior (Hoeben and Weerman, 2016).

While many scholars have different definitions of "general delinquency," it often includes property crime, violence, underage sexual activity, as well as alcohol use, cigarette smoking, illicit drug use, and other law-breaking activities (Agnew and Petersen 1989; Barnes et al. 2007; Bernburg and Thorlindsson 2001; Flannery et al. 1999; Hawdon 1996; Haynie and Osgood 2005; Higgins and Jennings 2010; Osgood et al. 1996; Vazsonyi et al. 2002; Weerman 2011). For example, Barnes and colleagues (2007) identified unstructured activity as a highly significant risk factor for heavy alcohol use, cigarette smoking, illicit drug use, delinquency and sexual activity. Moreover, there is ample evidence that strongly suggests that the presence of peers, absence of adult handlers, existence in public space, and involvement in unstructured activity, strongly increases adolescents' probability of engaging in delinquency (Augustyn and McGloin,

2013; Bernasco et al., 2013; Fleming et al., 2008; Haynie and Osgood, 2005; Maimon and Browning, 2010; Miller, 2013; Osgood and Anderson, 2004; Svensson and Oberwittler, 2010).

Furthermore, while Augustyn and McGloin's (2013) primary goal was to investigate gender differences, they were also able to conclude that more time spent in unstructured socializing with peers increased future predatory delinquency among their full sample of respondents. Additionally, scholars find that various forms of delinquency, including vandalism, theft, and violence, among other deviant behavior, is positively correlated with time spent in unsupervised activities, leisure activities with peers, and least favorite leisure activities with parents. However, they find that delinquency is negatively associated with organized activities, passive entertainment, and noncompetitive sports (Agnew and Petersen, 1989).

Unstructured socializing results in varying forms of delinquency by various mechanisms. Vandalism is particularly incentive driven since it is primarily influenced by exposure to temptations (Hoeben and Weerman, 2016; Osgood and Anderson, 2004). In contrast, the relationship between unstructured socializing and stealing is shaped by exposure to delinquent peers and their control over a person's actions (Hoeben and Weerman, 2016). Moreover, other studies concluded that those adolescents spending unsupervised time with peers often reported higher levels of anger, delinquency, substance use, and susceptibility to peer pressure (Flannery et al., 1999). Additionally, when investigating the effects of unstructured socializing, other scholars found that adolescents often engage in higher rates of delinquency if they have highly delinquent

friends and if they spend a great deal of time in unstructured settings with these friends (Haynie and Osgood, 2005).

Osgood and Anderson (2004) later employed Osgood et al.'s (1996) application of routine activity theory to individual deviant behavior to explain aggregate level variance. A collection of selected pupils, recruited from the same school and grade, was used as the unit of study. Regardless of whether individual-level variables or group means were regulated, unstructured socializing was still significantly correlated with juvenile delinquency. As such, they concluded that a population's level of socialization in unstructured settings is closely correlated with their rate of delinquency (Osgood and Anderson, 2004).

Other researchers examined the importance of parental roles during adolescence and the impacts these relationships had on spending time in unsupervised settings and participation in delinquency. Findings show that parental monitoring, more parental control, and a higher quality parent-child relationship were related to less time spent in criminogenic settings *(*Janssen et al. 2017). Findings also show that a decrease in parental control and in the quality of the parent–adolescent relationship were related to increases in the amount of time spent in criminogenic settings *(*Janssen et al. 2017).

Furthermore, in a study conducted by Hughes and Short (2014) in which they analyzed cross-sectional data, they were able to connect unstructured socializing to various juvenile delinquency behaviors, such as gambling, drinking, fighting, and illegal money making. Similarly, Wong (2005) also found associations between unstructured activities and various forms of delinquency, such as property crime, truancy, cheating during an exam, public disorder, missing class, cheating, abuse, and theft.

With the abundance of research conducted on the relationship between unstructured socializing and general delinquency, there have also been some inconsistent findings. Some research helps bring light to why involvement in unstructured socializing was related to some types of delinquency but not to others (Muller, Eisner, and Ribeaud, 2013). Muller and colleagues (2013) found that unstructured socializing predicted increases in shoplifting, vandalism, and a variety of other delinquent activities, while it was not related to assault. This may be due to the unspecific measure of unstructured socializing. They measured this variable using the following activities: "Meet friends in a flat where no adults are present," "go to a party in the evening without parents," "hang around with friends and have fun in a park, at a public transport station or in a shopping mall in the afternoon," and "hang around with friends and have fun in a park, at a public transport station or in a shopping mall in the evening" (Muller, Eisner, and Ribeaud, 2013). This depiction of unstructured socializing might not account for all three components of the variable and other measures used might also not be able to differentiate between different delinquent activities, leading to inconsistent results.

ii. Property Offending

While some scholars focused on explaining the relationship between unstructured socializing and general delinquency, others attempted to explain the effect of unsupervised activity on property crime. Whereas general delinquency is often reflected by a range of measures, including crime and substance use, as explained in the previous section, the crimes that are measured as property crime include things like burglary, stealing, and shoplifting. Felson and colleagues (2012) observed that rates of property

crime were higher during times that respondents engaged in more unstructured socializing.

Furthermore, unstructured socializing has been positively correlated with property crime in other studies as well. Specifically, unstructured socializing was found to be more strongly correlated with property crime for White and African American females than males (Lotz and Lee, 1999). Moreover, when specifically considering shoplifting, it was found that routine activities, such as "hanging around with friends," had a significant and positive association with shoplifting (Miller 2013). While considering all control variables, Anderson and Hughes (2009) concluded that a one-unit increase in time spent with friends increased the expected offending scores by 21% for property delinquency.

Bernburg and Thorlindsson (2001) also studied the association between unstructured socializing and property offending. They employed a measure of property crime that reflected offenses including stealing something worth more than $50, breaking into a building or a car with the intent to steal something, and ruining something that did not belong to them. Their study found that time spent in unstructured socializing was positively correlated with property offending (Bernburg and Thorlindsson, 2001). Additionally, Vasquez and Zimmerman (2014) investigated whether a link existed between an increase in an individual's time spent with peers and potential property offending. As shown by their analysis, property offending activities were positively correlated with the amount of time spent with peers.

iii. Violent Behavior

The effects of unstructured socializing and violent behavior have also been considered. Unstructured socializing positively effects violent behavior for several

reasons. Firstly, spending time with peers without adult supervision exposes teenagers to the possibility of interpersonal violence, either from within or between peer groups. The second explanation is that young people who participate in unstructured socializing frequently strive for imaginative ways to increase the quality of engagement while hanging out, and aggression can be one readily accessible tool (Briar and Piliavin, 1965). Thirdly, the physical costs of aggression are more likely to be minimized in a peer-based setting, with the involvement of friends decreasing the risk of violence and other physical conflict (Osgood et al., 1996).

Effects of unstructured socializing on an adolescent's violence is positive and highly significant. Specifically, a one standard deviation increase in an adolescent's unstructured socializing with peers increases the likelihood of violent offending by 37%. (Maimon and Browning, 2010). While considering all control variables, Anderson and Hughes (2009) concluded that a one-unit increase in time spent with peers increased the expected violence scores by 19%. Furthermore, when investigating the effects of unstructured socializing on violent behavior between immigrant youth and native-born youth, some differences between the two were noted. Particularly, a one standard deviation increase in unstructured socializing is associated with a 63 percent increase in violence for first-generation youth, and it is associated with a 22 percent and 30 percent increase, respectively, for second- and third-generation youth (Dipietro and McGloin, 2012). This suggests that exposure to unstructured activity has a greater impact on violent behavior for native-born youth rather than immigrant adolescents.

In a study conducted by Gage and colleagues (2005), it was concluded that respondents who mentioned spending many evenings out with their friends participated

in more aggressive and violent behavior than those who spent few evenings with their friends or no evenings with their friends. Similarly, studies conducted by Vazsonyi and colleagues (2002) and Zimmerman (2016) found related outcomes for the association between spending time with peers and violent behavior, such as carrying a hidden weapon, hitting someone, attacking someone with a weapon, throwing objects at people, armed robbery, and being involved in a gang fight.

iv. Substance Use and Handgun Carrying

Some studies have been successful in presenting substantial evidence for a correlation between unstructured socializing and general delinquency, violent and property offending, while others were successful in reinforcing this association for drug use (Miller, 2013; Wong, 2005). For example, Miller (2013) concluded that hanging out with friends away from home and engaging in nightlife activities increases the likelihood of drug use by 16% and 38%, respectively. However, other studies have focused more on the relationship between unstructured socializing and particular types of substance use such as cocaine, marijuana, hallucinogens, amphetamines, LSD, barbiturates, sedatives, tranquilizers, and tobacco (Flannery et al., 1999; Hawdon, 1999; Wallace and Bachman, 1991). Wallace and Bachman (1991), for example, reported that lifestyle measures such as evenings out and dating increase cocaine use by 8% and 4%, respectively.

Similarly, Flannery and colleagues (1999) established that adolescents who spend more unsupervised time with peers report higher levels of problem behavior such as substance abuse. Specifically, adolescents who spent more time with a friend and no adult reported the highest levels of substance use (Flannery et al., 1999). This research has been successful in demonstrating that the more time an individual spends in

unstructured socializing, the higher his or her risk for engaging in substance use (Miller, 2013).

Furthermore, Barnes and colleagues (2007) were also able to establish the same positive correlation between the amount of peer time per week (e.g., going to movies, getting together with friends informally, going out on dates, going to parties or other social events with friends, going to the mall with friends and talking on the telephone with friends) and the amount of drinking, smoking, and illicit drug use that they reported. Moreover, other studies concluded that the minimum required amount of time spent engaging in unstructured socializing with peers to pose a risk of alcohol or marijuana use is 3 to 5 hours per week. For tobacco use outcomes, the minimum number of hours required to pose a risk is higher, particularly for cigarette use, where risk begins at more than 20 hours per week (Meldrum and Leimberg, 2018). This suggest that parents should monitor the amount of time that adolescents spend in unsupervised settings with their friends, as the more time spent, the more risk for substance use.

Additionally, unstructured socializing accounts for variation in substance use when controlling for theoretically relevant covariates, including peer delinquency, self-control, and parenting practices (e.g., Augustyn and McGloin 2013; Haynie and Osgood 2005; Meldrum et al. 2015, 2009). In addition to assessing the effects of self-control, parental monitoring, and peer delinquency, other scholars tested the contextual effects of school on the relationship between unstructured socializing and drug use. While considering all control variables, Anderson and Hughes (2009) concluded that a one-unit increase in time spent in unstructured settings also increased the expected offending scores by 38% for heavy alcohol use and 55% for marijuana use (Anderson and Hughes,

2009). Similarly, Augustyn and McGloin (2013) concluded that spending more time with peers in unsupervised settings predicted higher counts of substance use for their entire sample ($b = .121$, $p < .001$).

In addition to having a strong and positive relationship with substance use, the effect of unstructured time with peers (??) socializing on substance use has also been considered among different race categories. The effect of time spent with peers has a much stronger influence on the substance use behaviors for White adolescents than for Black adolescents (Barnes et al., 2007) Moreover, availability at home and parental substance use is also found to be correlated with substance consumption among adolescents, but these indicators are not associated with initiation behavior. Instead, initiation seems to happen during unstructured socializing outside of the home, with availability at home acting as reinforcement once some level of substance use is established (Bouchard, Gallupe, Dawson and Anamali, 2018).

When investigating gender differences of the effect of unstructured socializing on substance use, Gage et al. (2005) found that the risk of substance use among females who reported spending most evenings out was over 7 times greater than for those spending few evenings out for frequent alcohol consumption and almost 5 times greater for frequent smoking. Additionally, a more recent study conducted by Leimberg and Lehmann (2020) concluded that unstructured socializing with peers is a stronger predictor of soft drug use rather than hard drug use. However, in their study, unstructured socializing had a significant and positive effect on both soft and hard drugs (Leimberg and Lehmann, 2020).

The previous literature makes clear that a positive association exists between drug use and unstructured socializing. However, previous studies have slightly overlooked the dynamic connection between unstructured socializing and handgun carrying. Often, weapon and handgun carrying is combined into measures of general delinquency along with other delinquent behaviors (Hoeben and Weerman, 2016), which makes it hard to assess the strength of the relationship between time spent in unstructured activities and weapon/handgun carrying, as this variable is not measured separately. Some studies have linked peer delinquency and peer influence to handgun carrying and gun violence (Pyrooz, Turanovic, Decker and Wu, 2016), while other results indicate that greater unstructured socializing with peers is positively associated with handgun carrying (Meldrum et al., 2020).

II. Moderating Effects of the Unstructured Socializing-Delinquency Relationship

Given that so many studies have found a correlation between unstructured socializing and delinquency, it is not surprising that researchers have dedicated considerable attention to determining the exact conditions under which the impact of unstructured socializing on delinquency is either enhanced or diminished (i.e., moderated). Previous research has explored how levels of self-control moderate the relationship between unstructured socializing with peers and antisocial behavior (LaGrange and Silverman, 1999; Hay and Forrest, 2008; Thomas and McGloin, 2013). Different factors such as school bonds, family dysfunction, peer delinquency, community features, extracurricular activities, and strain have also been explored as potential

moderators (Bernburg and Thorlindsson, 2001; Bernburg and Thorlindsson, 2007; Janssen, Weerman and Eichelsheim, 2017; Op de Beeck and Pauwels, 2010).

Moreover, scholars that have focused attention on the interaction between unstructured socializing and self-control usually found weak or mixed evidence supporting an interaction (LaGrange and Silverman, 1999; Maimon and Browning, 2010; McGloin and Shermer, 2009; Thomas and McGloin, 2013). In a study by LaGrange and Silverman (1999), risk-taking habits were positively linked to aggression, but not to property crimes and drug offenses. Further, some support is found for an association between unstructured socializing and self-control in predicting general crime (Hay and Forrest, 2008). The results from the study conducted by Hay and Forrest (2008) indicate that increases in opportunity amplify the effect of low self-control on the likelihood of engaging in deviant behavior. Theoretically, these findings reinforce the importance of emphasizing the interactions between "individual characteristics and the characteristics of the social environments in which they find themselves (Hay & Forrest, 2008, p. 1065)." However, a recent study did conclude that the effect of unstructured socializing on both soft and hard drug use is diminished among adolescents who are lower in self-control (Leimberg and Lehmann, 2020).

Previous studies have investigated the potential interaction between unstructured socializing and community characteristics. Researchers concluded that unstructured socializing is more strongly related to delinquency among adolescents enrolled in schools with higher levels of instability and related to violence among adolescents who reside in neighborhoods that are characterized as "unsafe" (Bernburg and Thorlindsson, 2007; Gage et al., 2005; Maimon and Browning, 2010).

Furthermore, researchers have been interested in whether the effect of unstructured socializing on delinquency is moderated by peer delinquency. Several studies suggested that peer delinquency amplifies the effect of unstructured socializing on delinquency and substance use (Bernburg and Thorlindsson, 2001; Mercer et al., 2016; Sentse et al., 2010; Svensson and Oberwittler, 2010; Thorlindsson and Bernburg, 2006; Wikström et al., 2012). However, other studies did not find evidence of an interactive effect (Agnew, 1991; Haynie and Osgood, 2005), or found a diminishing moderating impact (McGloin and Shermer, 2009).

Moreover, a few studies have also considered the direct effects of parenting and other parenting-related factors on the development of delinquency. Specifically, Bernburg and Thorlindsson (2001) found that the stronger the adolescents' relationship with their parents was, the less likely they were to commit delinquent acts when exposed to unstructured settings. They later claimed that the influence of spending time with friends on delinquency was diminished for participants whose parents knew their friends (Bernburg and Thorlindsson, 2007). Compared to other studies, the current research shows that the relationship between unstructured socializing and delinquency is diminished among individuals who experience greater parental acceptance, who find it easy to talk to their parents about bothersome issues, who have a better relationship with their parents, whose parents are involved with school, and for adolescents who experience more parental monitoring (Gage et al., 2005; Galambos and Maggs, 1991; Janssen et al., 2017; Pettit et al., 1999).

The effects of location where unstructured socializing takes place has been investigated, and the relationships between the amount of unstructured socializing and

delinquency have been found to differ across locations. It is noted that most youth crime occurs in public spaces, mostly in streets, parks, or recreational areas (Hoeben and Weerman, 2014). Findings indicate that the association between offending and unstructured socializing is significantly weaker in public entertainment settings than in public transportation and open spaces. The association between offending and unstructured socializing is significantly less for shopping centers than for open spaces, public transportation, and streets. Also, unstructured socializing on public streets is related more strongly to offending than unstructured socializing in private homes (Hoeben and Weerman, 2014). This suggests that the location where adolescents spend their time in unstructured socializing moderates the relationship between unstructured socializing and offending (Hoeben and Weerman, 2014).

Other variables of interest that have moderated the unstructured socializing-delinquency relationship have included how school bonds, extracurricular activities, and strain affect delinquency. In reference to school bonds, Thorlindsson and Bernburg (2001) found that the influence of unstructured socializing on violence and property offending was diminished for adolescents who report stronger bonds with their school. In regards to extracurricular activities, Gage et al. (2005) found that girls who spend less than one day a week engaging in extracurricular activities, such as youth club, swimming/athletics club, choir, and dance group are more likely to engage in problem behavior. Lastly, based on Op de Beeck and Pauwels' (2010) study, family and school strain are stronger predictors of offending among youths who do not engage in unstructured socializing.

2.3 Patterns and Predictors of Substance Use

In addition to the review of the literature on unstructured socializing and its effects on delinquency, it is of great relevance to also discuss the predictors of substance use and weapon carrying among adolescents. Research has shown that a large number of adolescents use substances, such as alcohol and marijuana. According to the 2019 Monitoring the Future Survey results, the past year use of illicit drugs among 12th graders remained steady for the past several years. The results showed that in the past year, 38% of 12th graders reported using illicit drugs, 11.5% reported using illicit drugs not including marijuana, 35.7% reported using marijuana, 3.6% reported using LSD, 3.3% reported using synthetic cannabinoids, 2.2% reported using cocaine, 2.2% reported using MDMA, and 0.4% reported using heroin.

Previous research shows that the use of drugs increases during puberty and is most prominent among adolescents in early adolescence. Substance use by adolescents has both immediate and long-term consequences for wellness, well-being, and maturity in adult roles (Chassin, Pitts, and DeLucia, 1999; Kandel, Davies, Karus, and Yamaguchi, 1986; Newcomb and Bentler, 1988). Specifically, drug use before age 17 is a good indicator of later use and dependency (Brook, Brook, Zhang, Cohen, and Whiteman, 2002; Clark, Kirisci, and Tarter, 1998; Dewit, Adlaf, Offord, and Ogborne, 2000). Substance dependency is related to a number of maladaptive effects, including both mental and physical illnesses and participation in both violent and petty crime (Brook et al., 2002; Lennings, Copeland, and Howard, 2003; Soyka, 2000). Teenage drug use has often been shown to be a part of other issue behaviors including anti-social activities such as violence, academic failure, and risky sexual activity (Ary et al., 1999; Barrera, Biglan,

Ary, and Li, 2001; Dishion and Patterson, 2006; Tapert, Aarons, Sedlar, and Brown, 2001). Thus, it is of great importance to understand unique risk and protective factors for early and continued use of drugs in order to assess the relationship unstructured activities have with the use of substances during adolescence (Van Ryzin et al., 2012).

Many researchers who analyze risk and protective factors related to adolescent drug use emphasize the importance of social context, and recognize the vital aspects of relationships within the family, such as parental monitoring and parent–child relationship quality (Dishion, Nelson, and Bullock, 2004). Most of this research has shown a strong association between parental control and adolescent drug use (Barrera et al., 2001; Kumpfer and Alvarado, 2003; Svensson, 2000). Parent-child communication skills are important for effective parental control, which helps minimize youths' exposure to risks from problem activity (Dishion and McMahon, 1998; Stattin and Kerr, 2000). Previous research on family-based interventions suggests that better parenting leads to lower adolescent delinquency and drug use (Dishion, Nelson, and Kavanagh, 2003; Dusenbury, 2000; Spoth, Redmond, and Shin, 2001).

Likewise, being close with your parents makes it more likely that you have less issues as a child, including drug use (Ackard, Neumark-Sztainer, Story, and Perry, 2006; Herman, Dornbusch, Herron, and Herting, 1997). Relationship quality with parents remains a robust indicator of delinquent behavior among youth even when adjusting for parenting styles and family structure (Crawford and Novak, 2008). Family theories posit that adolescents with a tight relationship with their parents would seek counsel from their parents and trust their parents' advice (Allen and Land, 1999; Brody, Moore, and Geli, 1994).

Peer relationships, such as hanging out with friends, are also significant in precipitating adolescent drug use (Barrera et al., 2001; Brook, Brook, Arencibia-Mireles, Richter, and Whiteman, 2001). Teens spend less time with their parents and are less involved in the family (Hill, Bromell, Tyson, and Flint, 2007; Larson, Richards, Moneta, Holmbeck, and Duckett, 1996; Loeber et al., 2000). Additionally, teens are more sensitive to the influence of social rewards and prefer to fit in with their peers, which sometimes involves participating in delinquent behavior, such as drug use (Spear, 2000). In turn, peers become increasingly dominant relative to parents over the course of adolescence and have a greater impact on delinquency and substance use at this stage of development (Berndt, 1979; Kandel, 1996). Furthermore, while teenagers may resist parental control during their adolescent years, research indicates that adults still continue to exert a strong influence on peers well into their 20s (Monahan, Steinberg, and Cauffman, 2009).

However, interactions with a deviant peer group during puberty raises potential likelihood of more deviant behaviors, such as substance use (Dishion, Capaldi, Spracklen, and Li, 1995; Dishion et al., 2004; Patterson, Dishion, and Yoerger, 2000). Deviant peer groups may influence individual actions in a number of ways, such as social learning, facilitation, peer pressure, and deviancy training, through which peers support each other by promoting deviant behaviors and activities (Dishion and Owen, 2002; Patterson et al., 2000). Early use of drugs can provide an entry point into a social circle that contributes to greater drug use later in life, which is often referred to as "peer contagion" (Dishion and Tipsord, 2010).

Thus, rather than considering parent and peer contexts and their individual impact on adolescent substance, it is beneficial to understand how they are both associated with adolescent drug use. To this end, parent-child relationships can affect an adolescent's actions and how often teens spend time with and communicate with peers. Ineffective parental monitoring is associated with higher levels of deviant peer association, and deviant peer association has been found to mediate the relationship between ineffective parental monitoring and various problem behaviors (Ary et al.,1999; Barrera et al., 2001). Also, if one is being closely watched, they are less likely to interact with peers that use drugs (Flannery, Williams, and Vazsonyi, 1999). Lastly, children who have a strong relationship with their parents are more likely to go to their parents for information and guidance and to internalize parental advice, which in turn affects the choice to use substances as well as the choice of peers, who can then have access to substances or exert peer pressure to use substances (Nash, McQueen, and Bray, 2005).

While much prior research suggests that parent-related variables are extremely relevant to predicting substance use and explaining the association with deviant peers who will encourage substance use, there are other personal and situational variables that help explain substance use (Voelkl and Frone, 2000). Some previous research has related adolescent substance use to demographic information such as age and gender. Evidence shows that adolescent boys report higher levels of overall alcohol and marijuana use than do adolescent girls (Bucholz, 1990; Johnston et al., 2019; Kann et al., 1998). Further, it has been shown that prevalence of substance use increases with age during adolescence, with the peak years of involvement occurring in young adulthood and then declining in later adulthood (Hirschi and Gottfredson, 1994).

The substance use literature also suggests that personality and behavioral traits play a role in overall levels of substance use (Voelkl and Frone, 2000). To this end, impulsiveness, rebelliousness, unconventionality, lower levels of self-control, and risk-taking propensity are dimensions that are positively associated with substance use (Colder and Chassin, 1993; Cox, 1987; Hawkinset al., 1992; Leimberg and Lehmann, 2020). Past research has repeatedly shown that attachment or bonding to conventional institutions such as school is inversely related to delinquency, school failure, and overall levels of substance use (Bahr, Marcos, and Maughan, 1995; Elliot and Voss, 1974; Hawkins et al., 1992; Paulson, Coombs, and Richardson, 1990). Last, the ease of availability to substances has also been noted in previous research as being highly associated with substance use among adolescents (Shenassa, Daskalakis and Buka, 2006; Resnick et al., 1997), and the details of this association with be further explained in Chapter five.

2.4 Patterns and Correlates of Weapon/Handgun Carrying

The continued presence of gun carrying presents numerous difficulties for society, schools, and most importantly, adolescents. The problem of youth carrying guns is not limited to schools since adolescents are carrying weapons in public places too. The increase of school-aged kids carrying guns presents a cause for a public-health concern among physicians, educators, policy makers, and parents (Kingery, Pruitt and Heuberger, 1996; Rajan and Branas, 2018).

Weapon carrying among juveniles has been linked to a higher risk for severe injury, sometimes even resulting in death. According to the 2015 Center for Disease Control and Prevention, it was reported that 16% of adolescents carried a weapon at least once in the

past 30 days (Emmert, Hall and Lizotte, 2018). In most states, it is illegal for minors to possess or carry firearms outside of parental supervision. Despite these recommendations, 18% of respondents to a 2013 Youth Risk Behavior Survey reported carrying a gun and 5% of respondents stated that they brought weapons to their school. With percentages of weapon carrying increasing fairly consistently since 2010 (Comer and Connolly, 2020; Perlus et al., 2014; Pham et al., 2017), juvenile weapon carrying and other problematic behaviors that can result from it remain a public concern (Wallace, 2017).

Research posits that important predictors and correlates of weapon carrying among adolescents are exposure to violence, residing in disadvantaged communities, having peers who own and carry weapons, and delinquent behavior such as drug use and gang membership (Hemenway et al., 1996; Webster, Gainer, and Champion, 1993; Wallace, 2017). Additionally, other research suggests that adolescents obtain and choose to carry weapons for reasons, such as fear of victimization (Cao, Zhang, and He, 2008; Wilcox, May, and Roberts, 2006; Wright, Rossi, and Daly, 1983), protection (Melde, Esbensen, and Taylor, 2009), a power boost when participating in delinquent behaviors (May and Jarjoura, 2006), and peer or gang influence (Bjerregaard and Lizotte, 1995; Lizotte, Krohn, Howell, Tobin, and Howard, 2000; Watkins, Huebner, and Decker, 2008).

While it is reported that most young people who carry weapons and firearms report doing so for self-protection (Hemenway, Prothrow-Sith, and Bergstein, 1996; Wilkinson, McGryde, Williams, Bloom, and Bell, 2009), this finding becomes incredibly problematic. Previous research refers to this as “contagion effect” that is often responsible for high rates of firearm carrying among youth. The “contagion effect” suggests that when some youth carry guns, even for protection, others become fearful

and, in turn, may be induced to carry guns themselves (Loftin, 1986; Decker, 1996; Hemenway, Prothrow-Stith, Bergstein, Ander, and Kennedy, 1996; Bailey, Flewelling, and Rosenbaum, 1997). Since youth do not actually know the prevalence of gun carrying among their peers, it is their perception that will influence behavior, and may lead to additional gun carrying (Hemenway, Vriniotis, Johnson, Miller and Azrael, 2011).

Another strong predictor of weapon carrying has been recent offending (Kodjo et al. 2003; McVie 2010; Spano et al. 2012; Saukkonen et al. 2016). Specifically, recent offending due to gang affiliation has been found to be a rather common correlate of adolescent weapon carrying (Lizotte, Krohn, Howell, Tobin, and Howard, 2000). Additionally, motivations for carrying a gun compared to other weapons may be different, with gun carrying associated with more violent intentions. Similarly, if weapon-carrying is driven by violent intentions, weapon-carrying would be rational in riskier areas as an intended victim has a higher likelihood of carrying a weapon. Previous studies have demonstrated that weapon-carrying and the type of weapon carried are influenced by the characteristics of the weapon carrier's neighborhood. The most commonly tested relationship is that between neighborhood deprivation and weapon-carrying. Baumer and colleagues (2003) showed that firearms were more likely to be used in assaults in deprived neighborhoods than in more affluent ones.

Furthermore, other research suggests that youth at higher risk of carrying a gun were those who had used alcohol, tobacco or drugs, had no adult who often encouraged them, had witnessed violence, never or rarely felt safe in one or more places, had been victimized by peers, had perpetrated violence themselves, were members of a gang, and believed it was fairly or very easy to get a gun (Hemenway, Vriniotis, Johnson, Miller

and Azrael, 2011). Other research suggests that genetic characteristics are also involved in a person's decision to carry a weapon (Beaver, 2013). In this regard, genetic factors do not directly reflect an individual's ability to carry a weapon, but they can shape one's ability to make decisions when given the opportunity in a specific environment or situation (Beaver, 2013).

In this case, an antisocial personality or a history of antisocial behavior might increase the probability of a person deciding to make the decision to carry a handgun. Thus, if antisocial traits or behaviors are genetically influenced then genetic effects would be detected on handgun carrying. Additionally, an adolescent with an underlying tendency for risk taking is likely to select environments that afford him or her the opportunity to act on personal risk-taking predispositions. These risk takers will therefore be more likely to choose an environment that is risky versus one that is relatively conservative and safe. The end result is that their choice of a riskier environment will be sculpted by genetic influences because of the effect that genetic influences have on creating their desire for risk taking, and, thus, aid in their decision given the opportunity to carry a weapon or engage in other delinquent behaviors (Beaver, 2013).

Moreover, as with the predictors of substance use, weapon carrying has also been correlated with demographics. It has been reported that males are between two (McVie 2010; Hemenway et al. 2011) and five (Molnar et al. 2004; Tigri et al. 2016) times more likely to report carrying a weapon than females. Additionally, previous research has reported that weapon-carrying tends to peak in mid-adolescence, and as with substance use, early weapon carrying is a strong indication that this behavior will continue (Hemenway et al. 2011; Swahn et al. 2013; Haegerich et al. 2014; Ilie et al. 2017).

Moreover, other research that considered race as a predictor of weapon carrying suggest that minority groups are at heightened risk of carrying a weapon compared to white respondents (Molnar et al. 2004; Hemenway et al. 2011; Swahn et al. 2013).

The correlates and predictors of substance use and weapon carrying presented here will play a vital role in helping to explain their association with unstructured activities in the subsequent chapters of this dissertation. Further, a review of the literature on unstructured socializing with peers revealed that researchers have found a strong connection between multiple forms of informal socializing and delinquent behavior. As evidenced, unstructured socializing has strong and positive associations with general delinquency, property offending, violent offending, and substance use. However, numerous aspects concerning the relationship between unstructured socializing, drug use, and carrying a gun remain relatively uncharted territory. The chapters that follow will provide the hypotheses and research questions for this dissertation.

CHAPTER 3

III. HYPOTHESES AND RESEARCH QUESTIONS

As outlined in Chapter 2, there is an abundance of research that has found unstructured socializing with peers to result in various forms of delinquent behavior among adolescents (see Hoeben et al., 2016). However, a review of previous literature on unstructured socializing with peers and its effects indicates that there are several areas of research that have received far less attention. Specifically, researchers have infrequently focused on explaining the relationship between unstructured socializing with peers, substance use, and handgun carrying. To further develop this line of research, there is a need for the examination of potential mediators and moderators of these relationships. The consideration of mediating and moderating variables can help to advance the field, test theory, and generate practical interventions. Thus, in an effort to fill a clear void, this dissertation considers the mediators and moderators of the unstructured socializing–substance use and unstructured socializing–handgun carrying relationships.

Based on aforementioned findings from empirical studies that examined the relationship between unstructured socializing with peers and antisocial behavior, I expect to find noteworthy associations between unstructured socializing with peers and both substance use and handgun carrying. The subsequent hypotheses and research questions for this dissertation are theoretically grounded in the most widely cited argument of why unstructured socializing with peers poses a threat for deviance among adolescents (Osgood et al., 1996).

The first set of hypotheses and research questions focuses on examining the variables that mediate the association between unstructured socializing with peers and

both substance use and handgun carrying. While some studies have started to investigate mediation of the unstructured socializing–delinquency relationship (see Agnew & Petersen, 1989; Bernburg & Thorlindsson, 2001; Boman, 2013; Hoeben & Weerman, 2016; Hughes & Short, 2014; Wong, 2005), none have focused on substance use and handgun carrying as outcomes. Thus, in an effort to assess mediating factors and how they improve our understanding of why involvement in unstructured socializing increases substance use and handgun carrying, the following hypotheses and research questions are presented.

3.1 Research Question 1

To what extent does the easiness of access to substances mediate the association between unstructured socializing with peers and drug use?

Hypothesis 1

The first hypothesis tests the effect of unstructured socializing with peers (IV) on substance use (DV) while being mediated by the easiness of access to different substances (MeV). It is anticipated that unstructured socializing with peers will have a positive effect on easiness of access to different substances and easiness of access to different substances will have a positive effect on substance use (see Figure 1). This assumption is based on the findings of previous research that have investigated the effects of ease of access to drugs, such as marijuana. Researchers concluded that the likelihood of marijuana use among adolescents reporting "very easy" access to marijuana are more than five times greater than among those reporting it would be "probably impossible" to obtain marijuana (Keyes et al., 2011). Other studies suggest that perceived ease of access to substances may be a particularly salient risk factor for substance use among

adolescents (Alter et al., 2006). In light of this, it may also suggest that unstructured settings like those defined by unstructured socializing with peers would foster the opportunity to achieve easier access to substances with the aid of social networks, which would consequently result in more substance use among adolescents. Therefore, it is expected that unstructured socializing with peers will be positively associated with substance use.

Figure 1. Hypothesized Model for the Effect of Unstructured Socializing on Substance Use while Mediated by Ease of Access

3.2 Research Question 2

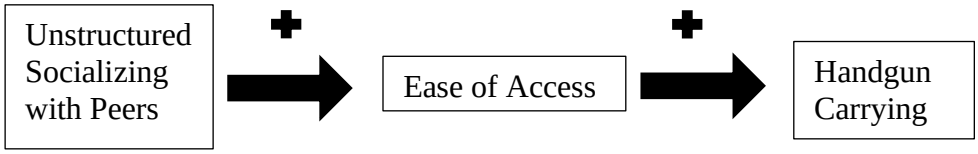
To what extent does the easiness of access to handguns mediate the association between unstructured socializing with peers and handgun carrying?

Hypothesis 2

The second hypothesis tests the effect of unstructured socializing with peers (IV) on handgun carrying (DV) while being mediated by the easiness of access to handguns (MeV). It is anticipated that unstructured socializing with peers will have a positive effect on easiness of access to handguns and easiness of access to handguns will have a positive effect on handgun carrying (see Figure 2). As presented in previous research, ease of access was modestly associated with increased handgun carrying (Williams et al., 2002). It is possible, then, that engagement in unstructured activities with peers could heighten

access to handguns and, in turn, increase handgun carrying. Thus, it is presumed that unstructured socializing with peers will be positively associated with handgun carrying.

Figure 2. Hypothesized Model for the Effect of Unstructured Socializing on Handgun Carrying while Mediated by Ease of Access



The next set of hypotheses and research questions explores potential gender differences in the association between unstructured socializing with peers and both substance use and handgun carrying. While previous research has established that the relationship between unstructured socializing and delinquency holds across both male and female samples (see Augustyn & McGloin, 2013; Barnes et al., 2007; Gage et al., 2005), they have derived inconsistent results. Additionally, previous studies that investigated the relationship between unstructured socializing with peers, different forms of deviance, and how this association varies for male and female adolescents, failed to truly capture the components of the unstructured socializing with peers variable. Accordingly, in an effort to investigate gender differences in the effect of unstructured socializing with peers on substance use and handgun carrying, the following hypotheses and research questions are presented.

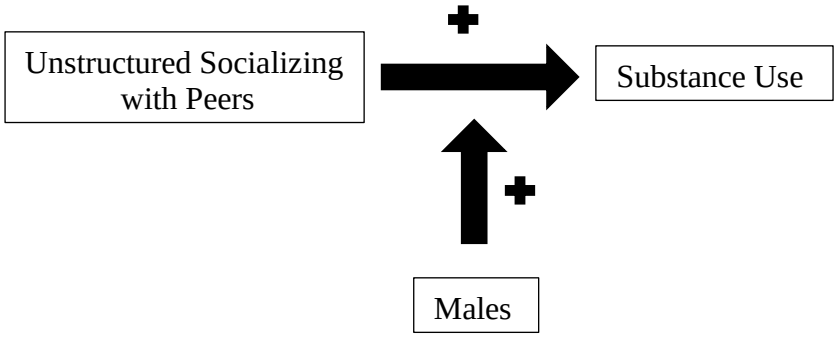
3.3 Research Question 3

Are there gender differences in the effect of unstructured socializing with peers on substance use among adolescents?

Hypothesis 3

The third hypothesis tests the effect of unstructured socializing with peers (IV) on substance use (DV) when moderated by gender (MoV). It is anticipated that being male will amplify the effect of unstructured socializing with peers on substance use (see Figure 3). In accordance with previous research (Augustyn & McGloin, 2013), it is expected that male adolescents will pose a significantly stronger risk for substance use during unstructured socializing than females.

Figure 3. Hypothesized Model for the Effect of Unstructured Socializing on Substance Use while Moderated by Gender



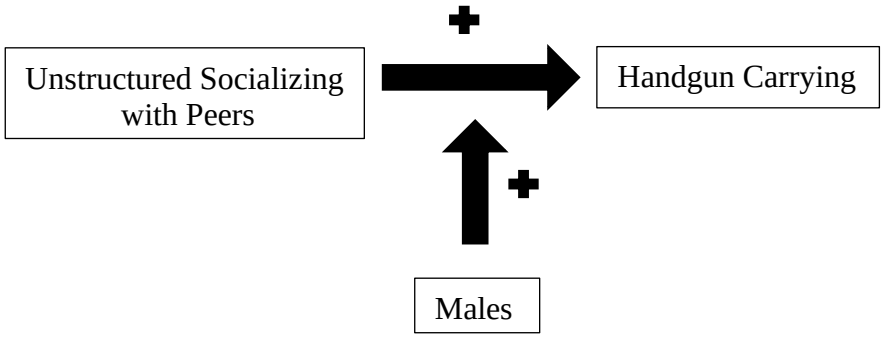
3.4 Research Question 4

Are there gender differences in the effect of unstructured socializing with peers on handgun carrying among adolescents?

Hypothesis 4

The fourth hypothesis tests the effect of unstructured socializing with peers (IV) on handgun carrying (DV) when moderated by gender (MoV). It is anticipated that being male will amplify the effect of unstructured socializing with peers on handgun carrying (see Figure 4). Previous studies on juvenile handgun carrying indicated that gender was the most significant factor for carrying weapons and found that males are four to five time more likely than females to carry guns and take them to school (Hemenway et al., 1996; Lizotte et al., 2000; Meldrum et al., 2020; Vaughn et al., 2012). To this effect, significant implications for handgun carrying may result from greater time spent in unstructured socializing with peers, which for male adolescents may heighten the risk for carrying a handgun.

Figure 4. Hypothesized Model for the Effect of Unstructured Socializing on Handgun Carrying while Moderated by Gender



The last set of hypotheses and research questions centers on examining the social and environmental variables that moderate the association between unstructured socializing with peers and both substance use and handgun carrying. Previous research has specified the conditions under which the effect of unstructured socializing on delinquency is either amplified or diminished (see Bernburg & Thorlindsson, 2001; Bernburg & Thorlindsson, 2007; Hay & Forrest, 2008; Janssen, Weerman & Eichelsheim, 2017; LaGrange & Silverman, 1999; Op de Beeck & Pauwels, 2010; Thomas & McGloin, 2013), however, this research did not specifically investigate the variables that moderate the association between unstructured socializing and both substance use and handgun carrying. Thus, in an effort to assess moderating factors and how they amplify or diminish the effect of unstructured socializing on substance use and handgun carrying, the following hypotheses and research questions are presented.

3.5 Research Question 5

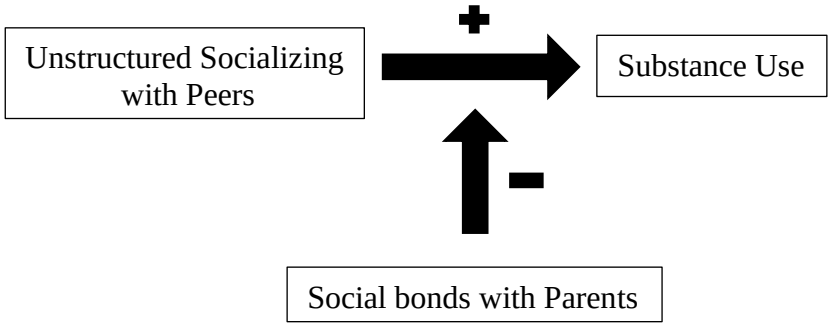
Do bonds with parents moderate the relationship between unstructured socializing with peers and substance use?

Hypothesis 5

The fifth hypothesis tests the effect of unstructured socializing with peers (IV) on substance use (DV) while being moderated by social bonds with parents (MoV). It is anticipated that greater bonds and social support from parents will diminish the effect of unstructured socializing with peers on substance use (see Figure 5). As previous literature suggests, the effect of unstructured socializing with peers on general delinquency was weaker for adolescents who experienced stronger parental bonds, better and more open relationships with their parents, experienced greater levels of parental monitoring, and

greater parental acceptance (see Bernburg & Thorlindsson, 2001; Bernburg & Thorlindsson, 2007; Gage et al., 2005; Galambos & Maggs, 1991; Pettit et al., 1999), which is predicted to hold true with substance use as an outcome.

Figure 5. Hypothesized Model for the Effect of Unstructured Socializing on Substance Use while Moderated by Social Bonds with Parents



3.6 Research Question 6

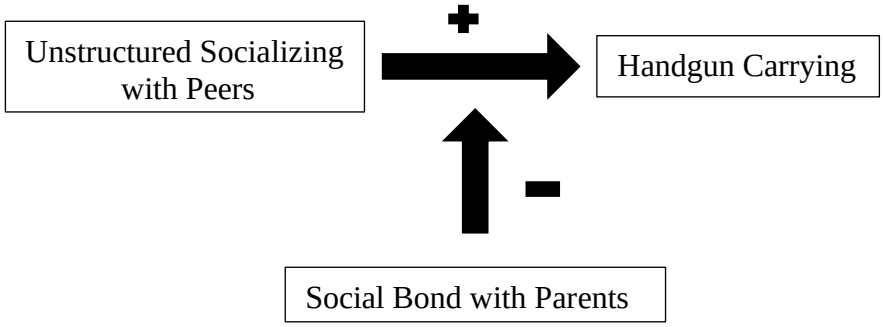
Do bonds with parents moderate the relationship between unstructured socializing with peers and handgun carrying?

Hypothesis 6

The sixth hypothesis tests the effect of unstructured socializing with peers (IV) on handgun carrying (DV) while being moderated by social bonds with parents (MoV). It is anticipated that greater bonds and social support from parents will diminish the effect of unstructured socializing with peers on handgun carrying (see Figure 6). Previous studies demonstrate a strong pattern of protective effects from parental ties, involvement, and supervision on reducing the odds of handgun carrying (Vaughn et al., 2012). Adolescents who carry handguns are far less likely to report a parent being involved in their lives,

which would enable the opportunity for more time spent in unsupervised activities with their peers, and thus, would result in more handgun carrying. Although, the opposite is expected to hold true in the current investigation, with those adolescents who report parental presence in their lives to be far more likely to not carry handguns.

Figure 6. Hypothesized Model for the Effect of Unstructured Socializing on Handgun Carrying while Moderated by Social Bonds with Parents



3.7 Research Question 7

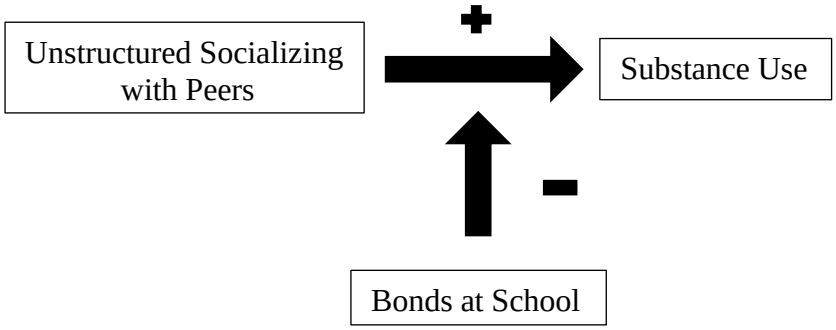
Do bonds at school moderate the relationship between unstructured socializing with peers and substance use?

Hypothesis 7

The seventh hypothesis tests the effect of unstructured socializing with peers (IV) on substance use (DV) while being moderated by bonds at school (MoV). It is anticipated that greater bonds at school will diminish the effect of unstructured socializing with peers on substance use (see Figure 7). As previous literature suggests, the effect of unstructured socializing with peers on general delinquency was weaker for adolescents who felt stronger bonds to their teachers and school work, did not experience school strain, and

participated in extracurricular activities (see Bernburg & Thorlindsson, 2001; Gage et al., 2005). This pattern is predicted to hold true with substance use as an outcome.

Figure 7. Hypothesized Model for the Effect of Unstructured Socializing on Substance Use while Moderated by Bonds at School



3.8 Research Question 8

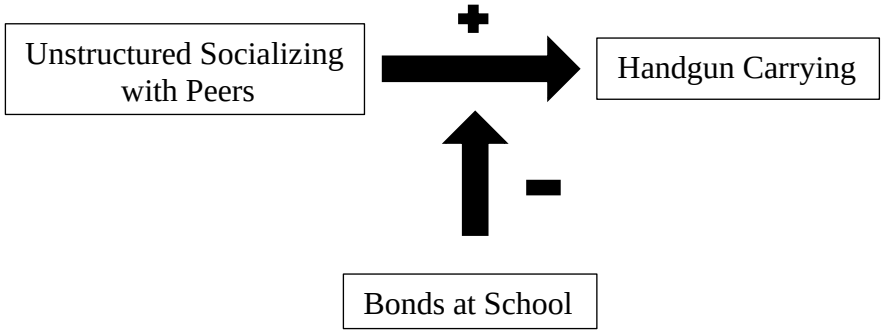
Do bonds at school moderate the relationship between unstructured socializing with peers and handgun carrying?

Hypothesis 8

The eighth hypothesis tests the effect of unstructured socializing with peers (IV) on handgun carrying (DV) while being moderated by bonds at school (MoV). It is anticipated that greater bonds at school will diminish the effect of unstructured socializing with peers on handgun carrying (see Figure 8). Previous research has identified predictors of violence and deviant behavior, which include poor school bonding (Communities That Care Youth Survey, 2009). Additionally, making students feel appreciated and rewarded for their involvement at school has been associated with a

decreased likelihood of their involvement in problem behaviors (Communities That Care Youth Survey, 2009). This is because students who feel appreciated for their activity at school bond to their school, and those students tend to have a decreased risk of engaging in minor and serious delinquency (Chung et al., 2002; Loeber et al., 2004; Parcel et al., 2010). This may extend to the idea that greater school bonding may decrease youth handgun carrying as a result of the influence of time spent in unstructured socializing because the feeling of attachment to school would discourage adolescents from engaging in delinquent behavior, such as handgun carrying.

Figure 8. Hypothesized Model for the Effect of Unstructured Socializing on Handgun Carrying while Moderated by Bonds at School



3.9 Research Question 9

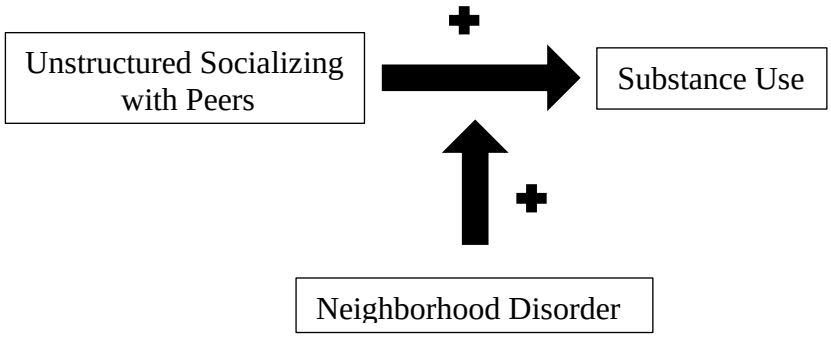
Does neighborhood disorder moderate the relationship between unstructured socializing with peers and substance use?

Hypothesis 9

The ninth hypothesis tests the effect of unstructured socializing with peers (IV) on substance use (DV) while being moderated by neighborhood disorder (MoV). It is anticipated that greater levels of neighborhood disorder will amplify the effect of

unstructured socializing with peers on substance use (see Figure 9). As previous literature suggests, the effect of unstructured socializing with peers on general delinquency was stronger for adolescents who resided in neighborhoods with lower levels of collective efficacy and in neighborhoods rated as unsafe (Bernburg & Thorlindsson, 2007; Gage et al., 2005; Maimon & Browning, 2010; Pettit et al., 1999). This premise is expected to extend to substance use in that adolescents who reside in unsafe, chaotic, and crime ridden neighborhoods, while also spending unsupervised time with their peers, will be more likely to engage in substance use.

Figure 9. Hypothesized Model for the Effect of Unstructured Socializing on Substance Use while Moderated by Neighborhood Disorder



3.10 Research Question 10

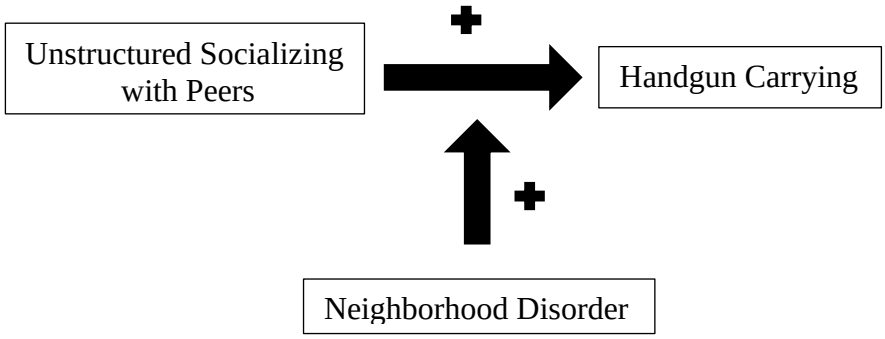
Does neighborhood disorder moderate the relationship between unstructured socializing with peers and handgun carrying?

Hypothesis 10

The tenth hypothesis tests the effect of unstructured socializing with peers (IV) on handgun carrying (DV) while being moderated by neighborhood disorder (MoV). It is

anticipated that greater levels of neighborhood disorder will amplify the effect of unstructured socializing with peers on handgun carrying (see Figure 10). As previous literature suggests, neighborhood disorder and handgun carrying are positively associated (Meldrum et al., 2020). However, previous literature very frequently modeled neighborhood disorder as having strong and positive associations with delinquency (Dubow, Edwards, & Ippolito, 1997; Gorman-Smith, 2000; Johnson, Jang, Li, & Larson, 2000; Vowell & Howell, 1998; Wikstrom & Loeber, 2000). Thus, it is very likely that neighborhood disorder will strengthen the association between unstructured socializing with peers and handgun carrying.

Figure 10. Hypothesized Model for the Effect of Unstructured Socializing on Handgun Carrying while Moderated by Neighborhood Disorder



The subsequent chapter will detail the data, variables, and analytical strategy that are used to analyze the research questions outlined above.

CHAPTER 4

IV. DATA AND MEASURES

As outlined in Chapter 3, this dissertation will assess ten research questions. These ten research questions will be tested within three separate studies in Chapter 5, Chapter 6, and Chapter 7. Chapter 5 will focus on the first study, which will examine Research Questions 1 and 2. Chapter 6 will contain the second study that investigates Research Questions 3 and 4. Last, Chapter 7 will include the third study, which will test Research Questions 5 through 10. The information that follows will detail the data and variables that are used to address the research questions outlined in Chapter 3.

4.1 Data

Data for this dissertation come from the 2018 Florida Youth Substance Abuse Survey (FYSAS). The FYSAS is a recurrent cross-sectional survey of public middle-school and high-school students in the state of Florida conducted annually since the 1999-2000 school year. The FYSAS is a collaborative effort between the Florida Departments of Health, Education, Children and Families, Juvenile Justice, and the Governor's Office of Drug Control. It is based on the "Communities that Care" survey, which evaluates risk and protective factors for substance use, in addition to substance use prevalence (Florida Department of Children and Families, 2018).

This survey measures the existing frequency of self-reported delinquent behaviors, such as drug use, that are exhibited by adolescents. The survey also measures the degree to which risk and protective factors exist in the community, family, school, and peer and individual environments (Florida Department of Children and Families, 2018). The results of this survey of 6^{th} to 12^{th}-grade public school students are used by

many state and local agencies on an annual basis to determine needs related to substance abuse and violence prevention programs, services, and resource allocation.

The FYSAS makes an effort to generate state-level statistical estimates that are representative of Florida public school students in each of the seven grade levels. In order to achieve this, a two-stage cluster-sampling methodology is utilized. The sample was stratified by county. In the first selection stage, separate groups of middle-schools and high-schools are randomly selected from all public middle and high schools in Florida, except for adult education, correctional, or special education schools. The probability of selection for each school is proportional to the size of the school's enrollment, meaning that larger schools have a higher chance of being selected than smaller schools. For the second sampling stage, survey coordinators are instructed on how to randomly select classrooms from the selected schools to fulfill the survey quota for each school. Since special education and English for speakers of other languages (ESOL) classes are not to be included in the survey, they are not included in the classroom selection list for each school (Florida Department of Children and Families, 2018).

This is the sample design that is used in prior even survey years (e.g., 2014, 2016), which allows for the inclusion of regional and county level data. However, the sample design for the FYSAS slightly differs in odd-year (e.g., 2015, 2017) administrations. In odd-numbered years, the goal of the survey is to produce results that are representative at the state level only, but not at the county level. Therefore, sample sizes for odd-year data are reduced and are usually between 8,000 and 12,000 respondents. Fortunately, the even-numbered year data tends to produce statistical estimates that are more precise and generalizable than estimates produced by the smaller

samples from odd-numbered years (Florida Department of Children and Families, 2018). It is for this reason I chose to utilize the 2018 FYSAS for this dissertation.

A passive consent procedure is used for the survey administration in nearly all of the participant schools. Students are given the consent notification and are asked to bring it home for their parents. It is then up to the parents to notify the school if they do not want their child to participate in the survey. The participation rate among the sampled middle-school students for the 2018 administration of the FYSAS was 78.1%, while the participation rate among the sampled high-school students was 69.0%. Students from 364 middle-schools and 322 high-schools participated in the 2018 FYSAS. Participation was impressive at the school level, with only 33 schools out of 719 declining to partake in the completion of the survey. The survey was administered in February of 2018 to 58,193 students in grades six through twelve from the 686 schools that agreed to participate (Florida Department of Children and Families, 2018).

Survey administration measures were consistent with the earlier years of the FYSAS and were standardized throughout the state. Each teacher received an appropriate number of surveys and survey collection envelopes. The survey utilized optical scan paper-and-pencil survey instruments for rapid data processing, limiting the format of the items on the survey to closed-ended, bubble-filled responses. Both the classroom teacher and the written instructions on the front of the survey form assure students that participation in the study is voluntary. Additionally, students were informed that they could choose not to answer any question that made them feel uncomfortable (Florida Department of Children and Families, 2018).

The 58,193 surveys were subjected to five validation tests pertaining to (a) alcohol, tobacco, and other drug (ATOD) exaggeration[5], (b) antisocial behavior exaggeration[6], (c) inconsistent patterns of drug use reporting,[7] (d) fictitious drug use reporting[8], and (e) non-response for more than 75% of the survey items[9]. Due to these validation tests, 3,582 student surveys (6.2%) were omitted from the original sample. The surveys were eliminated for the following strategies: (1) 1,088 exaggerated drug use, (2) 579 exaggerated other antisocial behavior, (3) 1,951 reported the use of the fictitious drug, (4) 1,283 responded in a logically inconsistent way, and (5) 1,168 answered fewer than 25% of the questions on the survey (Florida Department of Children and Families, 2018). The statistical consultant the state of Florida contracts with to process the FYSAS data removed the above cases. I did not determine the exclusion criteria.

After the removal of the invalid surveys, the sample size, before considerations of missing data on individual survey items used for the three studies within this dissertation,

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[5] ATOD exaggeration includes those surveys where students reported a combined average of four or more daily uses for illicit drugs other than marijuana. These surveys were eliminated because they were not taken seriously.

[6] Respondents who reported an unrealistically high frequency of behaviors such as, attacking someone with intent to harm, attempting to steal a vehicle, being arrested, getting suspended and taking a handgun to school, with more than 120 instances within the past year, were removed from the analysis.

[7] An example of an inconsistent response would be if a student reported that he or she had used alcohol three to five times in the past 30 days but also reported never having used alcohol in his or her lifetime.

[8] Students were asked if they had used a fictitious drug, Derbisol, in the past 30 days or in their lifetimes. If students reported the use of Derbisol for either of these time periods, their surveys were not included in the analysis of the findings.

[9] Students who answered less than 25% of the questions on the survey were removed from the analysis. This test is used to identify students who did not take the survey seriously or were incapable of fully participating.

is 54,611 cases. After removal of cases with missing data across each of the variables described below, the sample size for each individual study within this dissertation is 34,654[10]. The FYSAS enables the construction of a wide range of variables that may correlate with unstructured socializing, substance use, and handgun carrying, and, therefore, is an appropriate data set to be utilized for this dissertation. Additional information regarding the FYSAS can be found on the Florida Department of Children and Families website.[11]

4.2 Measures

I. Dependent Variables

Substance Use

Items from the FYSAS referencing past 30-day drugs use were used to construct two separate dependent variables in order to measure the two different classifications of drugs. These two variables were the *variety index for soft drug use* and *variety index for hard drug use*.

The *variety index for soft drug use* was created from the items referencing 30-day cigarette use, e-cigarette use, alcohol use, and marijuana use. To measure *cigarette use*, respondents were asked, "How frequently have you smoked cigarettes during the past 30 days?" The original response options were "not at all" (=0), "less than one cigarette per day" (=1), "one to five cigarettes per day" (=2), "about one-half pack per day" (=3),

[10] A more thorough explanation of how missing data was dealt with will be discussed in each individual chapter.

[11] https://www.myflfamilies.com/service-programs/samh/prevention/fysas/2018/docs/2018 FYSAS State Report.pdf

"about one pack per day" (=4), "about one and one-half packs per day" (=5), and "two or more packs per day" (=6). To measure *e-cigarette use*, respondents were asked, "During the past 30 days, on how many days (if any) have you used an electronic vaporizer such as an e-cigarette?" The original response options were "none" (=0), "1-2 days" (=1), "3-5 days" (=2), "6-9 days" (=3), "10-19 days" (=4), and "20-30 days" (=5). To measure *drinking*, respondents were asked, "On how many occasions (if any) have you had beer, wine, or hard liquor during the past 30 days?" The original response options were "0 occasions" (=0), "1-2 occasions" (=1), "3-5 occasions" (=2), "6-9 occasions" (=3), "10-19 occasions" (=4), "20-39 occasions" (=5), and "40 or more occasions" (=6). Finally, to measure *marijuana use*, respondents were asked, "On how many occasions (if any) have you used marijuana or hashish during the past 30 days?" The original response options for marijuana use were identical to those provided to measure drinking.

The *variety index for soft drug use* was created by first dichotomizing each of the four frequency measures of soft drug use, with no reported drug use coded as 0 and using the substance at least once in the past 30 days coded as 1. Thus, the range of possible values for the soft drug use variety index is 0 to 4, where a value of 0 represents that a respondent did not report any recent soft drug use at all and a value of 4 represents that the respondent used each of the four substances within the last month ($\alpha = 0.67$).

The *variety index for hard drug use* was created from items referencing 30-day inhalant use, methamphetamine use, club drug use, LSD use, cocaine/crack use, depressant use, prescription painkiller use, over the counter drug use, amphetamine use, steroid use, and heroin use. For each of the hard substances, respondents were asked on how many occasions they used that specific substance in the past 30 days. The original

response options for all of the hard substances were “0 occasions” (=0), “1-2 occasions” (=1), “3-5 occasions” (=2), “6-9 occasions” (=3), “10-19 occasions” (=4), “20-39 occasions” (=5), and “40 or more occasions” (=6). The *variety index for hard drug use* was created in the same manner as the variety index for soft drug use explained above, where a value of 0 represents that a respondent did not report any recent hard drug use at all, while a value of 11 represents that the respondent used each of the eleven substances within the last month ($\alpha = 0.61$).

As expected, since the prevalence of soft drug use tends to be much higher than that of hard drug use, there were many more participants that reported using all four of the soft drugs (356), than all eleven of the hard drugs (1). Moreover, there was only one respondent who reported use of ten hard substances, and six respondents who reported use of both seven and eight of the hard substances.

Additionally, each of the individual soft and hard drugs (15 in total) were used as dichotomies for supplemental analyses. In Study 1, all fifteen substance use outcomes were used in separate models to investigate the mediating role of ease of access to substances for the association between unstructured socializing and substance use. In Study 2, only the soft drugs use outcomes were used to examine the moderating role of gender in the association between unstructured socializing with peers and substance use. Last, in Study 3, only the soft drugs use outcomes were also used in separate models to better understand the moderating role of social bonds with parents, bonds at school, and neighborhood disorder when examining the association between unstructured socializing with peers and substance use.

Handgun Carrying

The data from the FYSAS was also used to construct another dependent variable that measured the *frequency of handgun carrying* in the past 12-months. To measure the *frequency of past 12-month handgun carrying*, respondents were asked, "How many times in the past year (12 months) have you carried a handgun?" The response options for this question were "Never" (=0), "1 or 2 times" (=1), "3 to 5 times" (=2), "6 to 9 times" (=3), "10 to 19 times" (=4), "20 to 29 times" (=5), "30 to 39 times" (=5), and "40+ times" (=6). Since most respondents answered that they never carried a handgun, I chose to dichotomize this variable with those individuals who have never carried a handgun in the past 12-months coded as 0 and those that carried a handgun at least once in the past 12-months coded as 1.

II. Mediating Variables

This dissertation has three principal mediating variables pertaining to the first study (research questions #1 and #2). The first mediating variable measures the *ease of access to soft drugs*. A *variety index for ease of access to soft drugs* was created from individual items referencing ease of access to alcohol, cigarettes, and marijuana. To measure the *ease of access to alcohol*, respondents were asked, "If you wanted to get some beer, wine or hard liquor (for example, vodka, whiskey or gin), how easy would it be for you to get some?" The response options were "Very hard" (=0), "Sort of hard" (=1), "Sort of easy" (=2), and "Very easy" (=3). To measure the *ease of access to cigarettes*, respondents were asked, "If you wanted to get some cigarettes, how easy would it be for you to get some?" The response options were "Very hard" (=0), "Sort of hard" (=1), "Sort of easy" (=2), and "Very easy" (=3). Last, to measure the *ease of access*

to marijuana, respondents were asked, "If you wanted to get some marijuana, how easy would it be for you to get some?" Again, the response options were "Very hard" (=0), "Sort of hard" (=1), "Sort of easy" (=2), and "Very easy" (=3).

The *variety index for ease of access to soft drugs* was created by first dichotomizing each of the three measures for ease of access to soft drugs, with "hard access" being coded as 0 and "easy access" being coded as 1. In order to create the dichotomies for all of the ease of access variables, response options of "Very hard" and "Sort of hard" were combined to make the "hard access" response category, and response options of "Sort of easy" and "Very easy" were combined to make the "easy access" response category. Thus, the range of possible values for the ease of access to soft drugs variety index is 0 to 3, where a value of 0 represents that a respondent has hard access to all three substances and a value of 3 represents that the respondent has easy access to all three substances ($\alpha = 0.79$). Additionally, each of the individual ease of access variables were used as dichotomies in supplemental analyses for individual soft drugs[12].

The second mediating variable measures the *ease of access to hard drugs*. To measure the *ease of access to hard drugs*, respondents were asked, "If you wanted to get a drug like cocaine, LSD or amphetamines, how easy would it be for you to get some?" The response options for this question were "Very hard" (=0), "Sort of hard" (=1), "Sort of easy" (=2), and "Very easy" (=3). The analysis variable was then created by

[12] The ease of access to cigarettes was used as a mediating variable for analyses for both cigarettes and e-cigarettes.

dichotomizing the measures for *ease of access to hard drugs*, with "hard access" being coded as 0 and "easy access" being coded as 1[13].

The third mediating variable measures the *ease of access to handguns*. To measure the *ease of access to handguns* respondents were asked, "If you wanted to get a handgun, how easy would it be for you to get one?" The response options for this question were "Very hard" (=0), "Sort of hard" (=1), "Sort of easy" (=2), and "Very easy" (=3). The variable was then created by dichotomizing the measure for *ease of access to handguns*, with "hard access" being coded as 0 and "easy access" being coded as 1[14].

III. Moderating Variables

This dissertation has four primary moderating variables. The first moderating variable, pertaining to the second study in the dissertation (research questions #3 and #4), is *gender*. Respondents were asked "Are you:" and the response options were "male," coded as 1, and "female," coded as 0.

The second moderating variable, pertaining to research questions #5 and #6, is *bonds with parents*. This variable was constructed from seven survey items. Respondents were asked to respond to the following, "My parents notice when I am doing a good job and let me know about it." The response options were "Never or Almost Never" (0),

[13] The "Very hard" and "Sort of hard" response options were combined to make the "hard access" response category, and the "Sort of easy" and "Very easy" response options were combined to make the "easy access" response category.

[14] The "Very hard" and "Sort of hard" response options were combined to make the "hard access" response category, and the "Sort of easy" and "Very easy" response options were combined to make the "easy access" response category.

"Sometimes" (1), "Often" (2), and "All the Time" (3). The second item asked respondents, "My parents ask me what I think before most family decisions affecting me are made." Response options were "NO!" (0), "no" (1), "yes" (2), and "YES!" (3). The third statement asked respondents, "How often do your parents tell you they're proud of you for something you've done?" The response options were "Never or Almost Never" (0), "Sometimes" (1), "Often" (2), and "All the Time" (3). The fourth item asked respondents, "Do you enjoy spending time with your mother?" Response options were "NO!" (0), "no" (1), "yes" (2), and "YES!" (3). The fifth statement asked respondents, "Do you enjoy spending time with your father?" Response options were "NO!" (0), "no" (1), "yes" (2), and "YES!" (3). The sixth item asked respondents, "If I had a personal problem, I could ask my mom or dad for help?" Response options were "NO!" (0), "no" (1), "yes" (2), and "YES!" (3). Last, the seventh statement asked respondents, "My parents give me lots of chances to do fun things with them." Response options were "NO!" (0), "no" (1), "yes" (2), and "YES!" (3). The seven-item measure was generated by taking the average of the items, with higher scores representing higher levels of bonds with parents ($\alpha = 0.87$).

The third moderating variable, pertaining to research questions #7 and #8, is *bonds at school.* This variable was constructed from fifteen survey questions. Respondents were asked, (1) "In my school, students have lots of chances to help decide things like class activities and rules." (2) "Teachers ask me to work on special classroom projects." (3) "My teacher(s) notices when I am doing a good job and lets me know about it." (4) "There are lots of chances for students in my school to get involved in sports, clubs and other school activities outside of class." (5) "There are lots of chances for

students in my school to talk with a teacher one-on-one." (6) "I feel safe at my school." (7) "The school lets my parents know when I have done something well." (8) "My teachers praise me when I work hard in school." (9) "Are your school grades better than the grades of most students in your class?" (10) "I have lots of chances to be part of class discussions or activities." Response options for each of the above items were "NO!" (0), "no" (1), "yes" (2), and "YES!" (3). Respondents were also asked, "How often do you feel that the school work you are assigned is meaningful and important?" Response options were "Never (0), "Seldom" (1), "Often" (3), and Almost always" (4). Respondents were also asked, "How interesting are most of your courses to you?" Response options were "Very Dull" (0), "Slightly Dull" (1), "Fairly Interesting" (2) "Quite Interesting" (3), and "Very Interesting and Stimulating" (4). Respondents were also asked, "How important do you think the things you are learning in school are going to be for your later life?" Response options were "Not at all Important" (0), "Slightly Important" (1), "Quite Important" (3), and "Very Important" (4). Last, respondents were asked, "Now, thinking back over the past year in school, how often did you enjoy being in school?" and "Try to do your best work in school?" Response options for the last two questions were ""Never (0), "Seldom" (1), "Often" (3), and Almost always" (4). Since the items that are used to create this variable are measured on different scales, some on a 4-point scale and others on a 5-point scale, each of the fifteen items were first standardized. The fifteen-item measure was then generated by taking the average of the standardized values, with higher scores representing higher levels of bonds to school (α = 0.84).

The fourth moderating variable, pertaining to research questions #9 and #10, is *neighborhood disorder*. Respondents were asked, "How much do each of the following statements describe your neighborhood? (a) crime and/or drug selling, (b) fights, (c) lots of empty or abandoned buildings, and (d) lots of graffiti." For each of the four criteria, response options were "NO!" (=0), "no" (=1), "yes" (=2), and "YES!" (=3). The four-item measure was generated by taking the average of the four items, with higher scores representing greater neighborhood disorder ($\alpha = 0.83$).

IV. Independent Variables

The current dissertation has one primary independent variable that is utilized across all three of the studies. The variable, *unstructured socializing with peers,* is measured by asking participants to respond to the question, "How many hours per week do you spend hanging out with friends, not doing anything in particular, where no adults are present?" (see Osgood & Anderson, 2004). The respondents were asked to choose from the following fourteen options: "0 hours" = 0, "1 to 2 hours" = 1, "3 to 4 hours" = 2, "5 to 6 hours" = 3, "7 to 8 hours" = 4, "9 to 10 hours" = 5, "11 to 12 hours" = 6, "13 to 14 hours" = 7, "15 to 16 hours" = 8, "17 to 18 hours" = 9, "19 to 20 hours" = 10, "21 to 22 hours" = 11, "23 to 24 hours" = 12, "More than 24 hours" = 13. For this dissertation, the fourteen-category ordinal measure of *unstructured socializing with peers* is utilized for all of the models.

V. Covariates

When seeking to identify to association between variables using observational data, it is essential to account for other variables that may reveal spurious associations. The utilization of the FYSAS data enable the inclusion of an array of covariates to be

added to the models in this dissertation that previous research shows are correlated with unstructured socializing with peers, substance use, and handgun carrying. Each of these covariates is described below.

Specific adolescent demographic characteristics such as age, gender, and race were accounted for in all of the models. *Age* is measured in whole years on an ordinal scale, with the youngest person being 10 (coded as 10) and the oldest being 19 (coded as 19). When gender is not being used as a moderating variable, it is used as a covariate. *Gender* is coded as a dummy variable, with female coded as 0 and male coded as 1.

The FYSAS allows respondents to select their race/ethnicity from seven separate racial categories: Native American, Asian, Black, Hispanic, Pacific Islander, White, and Other. This poses a conflict when creating a race variable because these categories are not mutually exclusive, meaning that participants could select more than one category for their race/ethnicity. Thus, the consideration for those adolescents that identified themselves as more than one specific race/ethnicity had to be taken into account. When generating the *Race* variable, respondents who identified themselves as Hispanic were coded as such regardless of their other selections. Second, if Black was selected along with any additional option(s) besides Hispanic, the respondent was coded as Black. Third, if a respondent selected multiple options that excluded Hispanic or Black (e.g. Asian and White), they were coded as Other. Finally, if a respondent selected only White, they were coded as White. The variable coded as White was used as the reference category in all of the models.

The respondent's *grades* were also taken into account. Respondents were asked, "Putting them all together, what were your grades like last year?" Response options were

"Mostly F's" (=0), "Mostly D's (=1), "Mostly C's" (=2), "Mostly B's" (=3), and "Mostly A's" (=4). The frequency of having *skipped school* was included in the models based on responses to the question, "During the last four weeks, how many whole days have you missed school because you skipped or cut?" Response options were "None" (=0), "1" (=1), "2" (=2), "3" (=3), "4-5" (=4), "6-10" (=5), and "11 or More" (=6).

Additionally, a four-item measure for *peer substance use* was included in the models where substance use was the dependent variable ($\alpha = 0.76$). Respondents were asked, "Think of your four best friends (the friends you feel closest to). In the past year (12 months), how many of your best friends have (a) smoked cigarettes? (b) tried beer, wine, or hard liquor when their parents didn't know about it? (c) used marijuana? and (d) used prescription drugs without a doctor's orders?" For each of the four items, response options were "none" (=0), "1" (=1), "2" (=2), "3" (=3), and "4" (=4). The four-item measure was generated by taking the average of the items.

The respondents' *own attitudes favorable of substance use* was included in models where substance use was the dependent variable. Respondents were asked, "How wrong do you think it is for someone your age to (a) drink beer, wine, or hard liquor (for example, vodka, whiskey or gin) regularly? (b) smoke cigarettes? (c) smoke marijuana and (d) use LSD, cocaine, amphetamines or another illegal drug?" For each of the four items, response options were "very wrong" (=0), "Wrong" (=1), "A little bit wrong" (=2), "not wrong at all" (=3). An average of the four items was taken ($\alpha = 0.79$). To measure *peer approval of substance use,* a four-item measure was created ($\alpha = 0.81$) using the responses to the question, "How wrong do your friends feel it would be for you to (a) have one or two drinks of an alcoholic beverage nearly every day? (b) smoke tobacco?

(c) smoke marijuana and (d) use prescription drugs not prescribed to you?" For each of the four items, response options ranged from "very wrong" (=0) to "not wrong at all" (=3). The four-item measure was generated by taking the average of the items.

A six-item measure was also included across all models for *low self-control*. The six items reflected the characteristics of impulsivity, risk-seeking, and anger, which past research has shown to be the aspects of low self-control most strongly related to antisocial behavior (Grasmick et al., 1993). The two items reflecting impulsivity were: (1) "I often do what brings me pleasure here and now, even at the cost of some distant goal." (2) "I am more concerned with what happens to me in the short run than in the long run." The two items reflecting risk-seeking were: (1)" I sometimes find it exciting to do things for which I might get in trouble." (2) "Excitement and adventure are more important to me than security." Last, the two items reflecting anger were: (1) "When I'm really angry, other people better stay away from me." (2) "When I have a serious disagreement with someone, it's usually hard for me to talk calmly about it without getting upset." For each of the six items, the response options were "strongly disagree" (=0), "Disagree" (=1), "Agree" (=2), and "Strongly Agree" (=3). The six-item measure was generated by taking the average of the items, with higher scores representing lower self-control ($\alpha = 0.78$).

Furthermore, *parental approval of substance use* was included in the models where substance use was the dependent variable ($\alpha = 0.71$) by averaging responses to the following four questions: "How wrong do your parents feel it would be for you to (a) have one or two drinks of an alcoholic beverage nearly every day?, (b) smoke cigarettes?, (c) smoke marijuana, and (d) use prescription drugs not prescribed to you?" For each of

the four items, response options ranged from “very wrong” (=0) to “not wrong at all” (=3). The four-item measure was generated by taking the average of the items.

When *neighborhood disorder* was not being used as a moderating variable it was included in all of the models as a covariate. As stated above, respondents were asked, “How much do each of the following statements describe your neighborhood? (a) crime and/or drug selling, (b) fights, (c) lots of empty or abandoned buildings, and (d) lots of graffiti.” For each of the four criteria, response options were “NO!” (=0), “no” (=1), “yes” (=2), and “YES!” (=3). The four-item measure was generated by taking the average of the items ($\alpha = 0.83$).

Additionally, both *bonds with parents* and *bonds at school* were utilized as covariates in all of the models when they were not being used as moderating variables. As explained above, the variable measuring *bonds with parents* was generated by taking the average of seven survey items, with higher scores representing higher levels of bonds with parents ($\alpha = 0.87$). The *bonds at school* variable was created by taking the average of the standardized values of fifteen survey items, with higher scores representing higher levels of bonds to school ($\alpha = 0.84$).

Other covariates include *parental monitoring* as a seven-item measure. The seven items were (1) “When I am not home, one of my parents knows where I am and who I am with.” (2) “Would your parents know if you did not come home on time?” (3) “If you drank some beer, wine or liquor (for example, vodka, whiskey or gin) without your parents’ permission, would you be caught by your parents?” (4) “If you skipped school, would you be caught by your parents?” (5) “The rules in my family are clear.” (6) “My family has clear rules about alcohol and drug use.” and (7) “My parents ask if I’ve gotten

my homework done." For each of the seven items, the response options were "NO!" (=0), "no" (=1), "yes" (=2), and "YES!" (=3). The seven-item measure was generated by taking the average of the items ($\alpha = 0.83$).

Next, a single-item measure for *suspension* was included in all models. Respondents were asked, "How many times in the past year (12 months) have you been suspended from school?" Response options were "Never" (=0), "1 or 2 times" (=1), "3 to 5 times" (=2), "6 to 9 times" (=3), "10 to 19 times" (=4), "20 to 29 times" (=5), "30 to 39 times" (=5), and "40+ times" (=6).

A single-item measure of *family members with alcohol or drug problems* was also included in all models. The item asked, "Has anyone in your family ever had a severe alcohol or drug problem?" with response options of "No" (=0) and "Yes" (=1).

For the models in each of my three studies with handgun carrying as an outcome, various handgun carrying related variables were utilized. To measure the level of *parental monitoring for handgun carrying,* respondents were asked, "If you carried a handgun without your parents'

permission, would you be caught by your parents?" Response options were "NO!" (=0), "no" (=1), "yes" (=2), and "YES!" (=3). Also, the respondents' *own attitudes favorable of handgun carrying* was included. Respondents were asked, "How wrong do you think it is for someone your age to take a gun to school?" Response options were "very wrong" (=0), "Wrong" (=1), "A little bit wrong" (=2), and "not wrong at all" (=3).

The chapters to follow will detail the analytical strategy used for each of the three separate studies in this dissertation, results for each study, and a literature review specific to the research questions being examined in each study.

CHAPTER 5

V. THE MEDIATING ROLE OF EASE OF ACCESS TO DRUGS AND HANDGUNS FOR THE ASSOCIATION BETWEEN UNSTRUCTURED SOCIALIZING WITH PEERS AND USING DRUGS AND CARRYING HANDGUNS

5.1 Introduction

The past two decades have witnessed substantial change in policies and public opinion regarding the regulation, distribution, and use of drugs and firearms in the United States. These changes have been a result of public health concerns surrounding the issues of substance abuse and firearm-related deaths and violence, especially among adolescents. Often, as a result of their accessibility (Hohl et al., 2017), the use of drugs and the possession of firearms creates substantial problems and adverse effects on youth during critical periods of development. Specifically, adolescents who carry guns and use drugs and alcohol increase their risk for violent injury and death. [I would add here 'the numbers' of gun-related deaths and drug- and alcohol-related deaths, followed by a statement from policymakers about the problem and/or your own statement about it].

Previous research has found significant associations between perceived access to substances and firearms and the likelihood of substance use and gun-related behaviors (Chauhan et. al., 2011; Chen & Wu, 2016). Additionally, it has been documented that noteworthy associations also exist between substance use and handgun possession (Cerdá et al., 2010; Chauhan et. al., 2011; Chen & Wu, 2016; Warren, Smalley, & Barefoot, 2015). With that being said, the regulation of substances has often been at the forefront of policy change in order to combat both firearm and drug-related violence and death. With firearm-related homicide being the second leading cause of death among 15- to 24-year-

old young adults in the United States, and substance use being one of America's top public health concerns among adolescents, these changes are crucial for the safety of America's youth (Kacanek & Hemenway, 2006; Warren, Smalley, & Barefoot, 2015).

Several studies have investigated the prevalence of substance use and firearm possession among youth and found that by the time adolescents reach high school, three-fourths of students report having engaged in at least one form of substance use, and 10% report that they have carried a firearm at least once (Komro, 1999; Warren, Smalley, & Barefoot, 2015). Ease of access has been recognized as one of the main underlying causes of the current substance use and school shooting epidemic among America's youth, with adolescents' perceptions of ease of access significantly increasing their risk for use and possession (Komro, 1999; Warren, Smalley, & Barefoot, 2015). With substance use and gun-related violence frequently being related, it is important to draw attention to the access of drugs and guns as the leading cause of this behavior, and the risks associated with their accessibility.

5.2 Importance of Ease of Access

With changing times, new technologies, and innovations in convenience changing the landscape for our access to products and services, we have seen a profound impact on our exposure to drugs and firearms. These exposures have had many adverse consequences for youth around the world, with overdose and firearm-related deaths increasing at an exponential rate (Pallin et al., 2019; Rudd et al., 2016). Moreover, the ability to easily access drugs and alcohol may have many consequences, such as handgun carrying, violence, adolescent substance use, addiction, and even death. Therefore, it is

crucial to assess the impact of ease of access to substances and handguns in order to intervene in these outcomes.

I. Substance Use

Previous research has examined the risks associated with and the effects of the ease of access to drugs and alcohol for adolescents. Most commonly, previous studies explored the perceived ease of access to alcohol, tobacco, and marijuana, with only a few studies focusing on risks associated with accessibility to other illicit substances. Data from the 2012 National Survey on Drug Use and Health reveals that, for adolescents ages 12–17, 48% indicate that marijuana is "Fairly or Very Easy to Obtain," 26% indicate ease of access to cocaine, 16% to heroin, and 15% to LSD. Furthermore, the survey also examined ease of access of substances by grade and found that by the 12th grade, 91% of students reported ease of access to alcohol, 82% to marijuana, and 30% to cocaine (Warren, Smalley, & Barefoot, 2015).

Additionally, Keyes and colleagues (2011) found, in a study using Monitoring the Future data from 1976 to 2007, that the likelihood of marijuana use among adolescents reporting "very easy" access to marijuana was more than five times greater than among those reporting it would be "probably impossible" to obtain marijuana. Moreover, other research indicates that perceived easy access to marijuana was robustly associated with the increased likelihood of past-year use of alcohol, tobacco, and marijuana, and delinquency such as handgun carrying, violent attacks, and other criminal justice system involvement (Alter et al., 2006).

Furthermore, other findings indicate that students' lifetime use of various drugs was a result of ease of access coupled with the effect of friends' substance use (Vidourek,

King & Burbage, 2014). The pressure from peer groups is frequently thought to be an important factor influencing drug use among adolescents. In addition, peers are often key to introducing and providing sources of drugs to their friends. Research suggests that students who are homeschooled may be at a substantially reduced risk to access and use substances compared to adolescents who attend school (Vaughn et al., 2015). This may suggest that unstructured settings, peer groups, and the pressure that accompanies their presence could heighten the risk of perceived access and ease of access to substances, and the use of them.

Given the interest of perceptions of the ease of access and its associated risks, researchers also began investigating differences in perceived access to alcohol, tobacco, and other drugs based on geographic location. Geographic location has been associated with distinct cultural factors that can have a significant impact on one's attitudes, beliefs, behavior, and experiences. Living in and attending school in an urban or rural area likely has a significant impact on adolescents' perceptions of the ease of access to different substances. Overall, it was found that rural students reported higher access to "legal" substances including alcohol, tobacco, and steroids, with urban students reporting higher access to "illegal" substances including marijuana, cocaine, inhalants, ecstasy, and hallucinogens (Warren, Smalley, & Barefoot, 2015).

Furthermore, this line of research reveals patterns that can aid in developing innovative practices to hinder access to substances as well as their use. In the domain of parenting, youth perceptions of easy access to marijuana were associated with lower levels of parental affirmation/warmth, limited control, and the increased likelihood of recurrent child–parent conflict. In the domain of school-related factors, youth reporting

easy access to marijuana reported lower levels of academic engagement, and were more likely to report poor grades/academic difficulty and perceived peer marijuana use (Salas-Wright, Oh, Goings & Vaughn, 2017). This suggests that access to substances accompanied by parental and school-related risks can indicate a higher prevalence of access and use, and should be addressed in future research and policy.

II. Handgun Carrying

Gun-violence among adolescents is a rising national concern and a complex societal problem with a multitude of risk factors, such as individual-level characteristics, family relations, and peer and societal influences. One of the primary influences that contributes to the lethality of adolescent violence is the easy availability and ready access to firearms (Komro, 1999). For example, perpetrators of school shootings have ready access to weapons because shootings could not occur without gun access. Although limiting gun access would likely not stop those who are committed to an attack, limited access complicates the process and brings an added level of scrutiny that may deter a potential shooter (Wike & Fraser, 2009).

Thus, the access to a gun is key to carrying it and using it as a weapon during a crime. Approximately 25% of youth report that guns are easily accessible at home (Resnick, Bearman, Blum, Bauman, Harris, Jones & Ireland, 1997). If homes provide a venue in which adolescents have easy access to guns, adolescents have an increased risk of suicidality, involvement in interpersonal violence, and handgun carrying. The removal of guns from the home, as those with easy access to guns in the home are more likely to be violent and more likely to attempt suicide, can reduce adolescent handgun carrying (Resnick et al., 1997).

Other studies report that among youth who report carrying a firearm, 55% of youth carry a firearm all the time, with 84% reporting occasional carrying, and 41% reporting that they carry it to school (Ash at el., 1996; Callahan et al., 1993). Previous research also suggests that males are more likely than females to carry a handgun; minority youth are more likely to carry a handgun; and those living in rural areas are more likely to carry a handgun (Sadowski et al., 1989). This solidifies the concerns that gun access and gun carrying are prominent issues among the youth population (Komro, 1999).

However, some findings do little to confirm the common perception that juveniles can obtain firearms relatively easily. First, 50% of adolescents report that obtaining a gun would be "little" or "no" trouble if they desired one; yet, the other 50% rated the task as "a lot of trouble" or "impossible" (Sheley & Wright, 1998). Although perceived ease of access to handguns is often associated with increased handgun carrying, most students who report relatively easy access to handguns do not ever carry one (Williams, Mulhall, Reis & De Ville, 2002). Perceived access is often modestly associated with handgun carrying (Williams et al., 2002). But overall, regardless of perceived access, the strongest correlates of handgun carrying behaviors are variables directly associated with handguns, violence variables, delinquency variables, and substance use variables (Williams et al., 2002).

Additionally, and similar to the ease of access and use of substances, the role of parents emerges as a significant correlate of carrying handguns (Bailey et al., 1997). Environments created within the home by parents which convey to the adolescent parental disapproval of gun possession and carrying, and possible punishment if found in

possession of a handgun appear to work against the adolescent carrying one. However, family settings in which parents fail to communicate effectively their expectations about gun possession and carrying, or in which they do not communicate at all, appear to enable an adolescent's decision to carry a gun (Simon et al., 1999; Williams et al., 2002). Interpersonal influences are also seen for those adolescents who associate in peer groups in which handgun carrying is seen as "cool," given that they are more likely to self-report carrying a handgun and taking one to school. Those adolescents who have a handgun and who bring it to school are the ones that are of the greatest concern to school administrators, and often, peer influence is evident in explaining why they engage in this behavior (Williams et al., 2002).

Furthermore, researchers also became interested in not only the ease of access to handguns but also the sources of the weapons, as this also plays a vital role in whether an adolescent will carry and use a gun for a violence act. In one study, adolescents who carried a handgun outside the home during the past 12 months were asked where they obtained the handgun and 48% percent had been given or loaned the gun by a family member or friend, and 4% reported sneaking the gun from home (Sheley & Wright, 1998). Six percent had stolen or traded something for the gun, while 7% had used other, unspecified means of acquisition. The remaining 35% stated that they had bought the gun, most commonly from a family member or friend. Importantly, less than 5% of respondents claimed to have asked someone to purchase a gun for them from either legal or illegal sources during the past 12 months (Sheley & Wright, 1998). Studies report that juveniles' perceptions of ease of access to firearms by source are typically "easy," which remains problematic (Komro, 1999). This suggests that future research and policy should

aim at reducing the likelihood that adolescents will become involved in firearm carrying by restricting access and possession of firearms through targeting the source of the firearms.

III. Unstructured Socializing, Opportunity, and Ease of Access

Previous literature concludes that many adolescents report fairly easy access to various substances and firearms, which contributes to substance use and gun carrying (Resnick et al., 1997; Warren, Smalley, & Barefoot, 2015). However, it is crucial to examine the effects of both opportunity and availability in accessing substances and handguns, and how this contributes to substance use and handgun carrying. The element of unstructured socializing can play an essential role in providing adolescents the opportunity to easily access drugs and firearms, which, in turn, can lead to substance use and handgun carrying.

Availability and opportunities are hard to ignore when examining how adolescents come into contact with, and eventually, use substances and carry handguns. Beyond easy access and availability, opportunities for substance use and handgun carrying are likely to arise more frequently for adolescents whose activities tend to involve informal socializing and lack the presence of authority figures (Osgood et al., 1996).

Although much is known about substance use and handgun carrying among adolescents, few studies have relied on *both* the ease of access/availability and the opportunity perspective proffered by Osgood and colleagues (1996) to examine substance use and handgun carrying. Doing so is important because the sourcing channels, such as

peers, play an important role in exposing adolescents to substances and handguns, and helping them obtain these things.

Hanging out with friends, in particular, has been shown to predict higher levels of substance use and handgun carrying. The more time adolescents spent with their peers in an unstructured setting, the greater the frequency of substance use and handgun carrying (Bouchard, Gallupe, Dawson & Anamali, 2018). The robustness of this indicator as a predictor of substance use and other forms of delinquency, such as handgun carrying, makes unstructured socializing an important factor to account for when modeling crime and delinquency. Additionally, a recent study examining the link between unstructured socializing and handgun carrying established that greater time spent in unstructured activities was positively associated with handgun carrying and taking a handgun to school (Meldrum et al., 2020). Thus, failing to control for how adolescents spend their time would neglect the consideration of a major component for explaining the reason for substance use and handgun carrying.

Results of previous research suggest that opportunity reduction initiatives may help prevent the use of various substances. Additionally, previous literature confirms that parents have a role to play to reduce access in the home setting. In fact, the availability of substances at home is often found to be a general indicator for substance use (Bouchard et al., 2018). Since availability at home is correlated with substance use, but not an indicator of initiation behavior, this implies that initiation seems to be reinforced by unstructured socializing outside of the home, with availability at home acting as a reinforcement once some level of substance use is established (Bouchard et al., 2018). This rational is expected to extend to the availability, access, and carrying of handguns,

suggesting that the examination of opportunity and access are vital to the explanation of delinquent behaviors, such as substance use and handgun carrying. Specifically, it is of great importance to see how availability/access can further explain the relationship between unstructured socializing and delinquent behaviors, such as substance use and handgun carrying.

5.3 The Current Investigation

As explained in Chapter 3, this chapter focuses on examining whether the ease of access to substances and handguns mediates the association between unstructured socializing with peers and both substance use and handgun carrying. This chapter tests the first and second hypotheses. The first hypothesis tests the effect of unstructured socializing with peers (IV) on substance use (DV) while being mediated by the easiness of access to different substances (MeV). It is anticipated that unstructured socializing with peers will have a positive effect on easiness of access to different substances and easiness of access to different substances will have a positive effect on substance use. The second hypothesis tests the effect of unstructured socializing with peers (IV) on handgun carrying (DV) while being mediated by the easiness of access to handguns (MeV). It is anticipated that unstructured socializing with peers will have a positive effect on easiness of access to handguns and easiness of access to handguns will have a positive effect on handgun carrying. The analytical strategy and results for this chapter are presented below.

5.4 Analytical Strategy

All models are estimated using STATA 15.1 and the cluster option. Hence, robust standard errors are reported that adjust for the clustering of the participants within the 686

schools. The cluster option takes into account the non-independence of having students from within the same schools participate in the FYSAS. This correction has no influence on the coefficients, but rather it adjusts the standard errors to account for the non-independence.

As outlined in Chapter 4, this study will test the first two research questions, which assess whether the ease of access to various substances and handguns mediates the relationship between unstructured socializing with peers and both substance use and handgun carrying. In order to make it easier to interpret the results pertaining to the effect that unstructured socializing with peers has on substance use and handgun carrying, all of the independent and control variables that were not dichotomized were standardized. Standardizing variables is an important process that puts variables on a uniform scale, which then allows for comparing effect sizes (Cite?). Additionally, regression models typically have an excessive amount of multicollinearity, which can hide statistically significant terms, and cause the coefficients to switch signs (Cite?). Fortunately, standardizing variables is also a straightforward technique used to reduce multicollinearity and its associated consequences.

The original sample in the 2018 FYSAS contained 54,611 cases. After removal of cases with missing data across each of the variables utilized in this chapter, the sample was reduced to 34,654. The cases that had missing values were completely deleted from the sample. While more advanced methods for handling missing data could have been employed, for this dissertation I elected to use the available data without any imputation procedures, since the sample remained large after the removal of cases with missing data.

In order to assess if data loss is correlated with variables such as age, sex, and race, I used statistical methods to assess differences between my sample of 34,654 youth and the 19,957 youth that were excluded from the analyses because of listwise deletion. In order to do this, I created a dummy variable called "missing" before deleting any data, where a "0" represented the youth that were included in my sample and a "1" represented the youth that were not included. Following this, I ran tests to assess whether the percent for sex (male) and race (white) are different on the missing variable (chi-square test) and whether the average for age is different on the missing variable (t-test).

Considering that with listwise deletion approximately 37% of the 54,611 cases in the data file were lost, only slight differences can be observed across the age, sex, and race variables. For the sex variable, the sample that is excluded from my analysis consists of 55% males as opposed to 45% males in the sample that is included ($\chi 2 = 438.33$, $p < .001$). This means that males were more likely to be excluded my analysis. When analyzing differences on the race variable, the sample that is excluded from my analysis consists of 63% non-white participants, and the sample that is included consists of 51% non-white participants ($\chi 2 = 806.15$, $p < .001$). This means that racial minorities were more likely to be excluded from my analysis. Last, the differences between the included and excluded samples for age were trivial, with a mean age of 14.34 in the sample of included respondents, and mean age of 14.05 in the sample with the excluded respondents ($t = 16.60$, $p < .001$). This indicates that younger respondents were more likely to be excluded from my sample. [Maybe state that the slight differences won't impact the external validity of the sample, or something along those lines]

After the removal of missing data, a series of negative binomial and logistic regression models were estimated using the two variety index drug classifications (i.e., soft drug use and hard drug use) and handgun carrying measures as outcome variables, the standardized measure of unstructured socializing with peers as the primary predictor variable, ease of access variables as mediating variables, and all of the aforementioned covariates. Additionally, individual analyses for each of the drugs comprising the variety indices were also estimated.

For the count outcomes, (i.e., the variety index variables) negative binomial regression was utilized. Negative binomial regression was used instead of Poisson regression because it is more appropriate for count outcomes like those used in this study (Ver Hoef & Boveng, 2007). Negative binomial regression tends to be more commonly used than Poisson regression because it is less impacted by overdispersion and by statistical dependence (Ver Hoef & Boveng, 2007). Additionally, given that a large percentage of the sample reported engaging in zero substance use and that the variance of each of the variety indices exceeds their mean values, negative binomial regression is preferred over Poisson regression. For the dichotomized outcomes, logistic regression is utilized. Logistic regression is the most appropriate regression analysis method to conduct when the dependent variable is a binary variable.

For the analyses in this study involving mediating variables, the Baron and Kenny (1986) method is utilized by estimating different regressions. Each analysis required the estimation of four models: (1) the independent variable (USWP) predicting the mediating variable, (2) the independent variable (USWP) predicting the dependent variable, (3) the mediating variable predicting the dependent variable, and (4) the independent variable

(USWP) predicting the dependent variable with the mediator added as a covariate. These four sets of regressions are required to show the association between the variables being utilized in each model. Then, the percent mediation was calculated using a percent change calculator for the coefficient from the second and fourth model. Below, the descriptive statistics are presented for each of the variables used in this chapter, followed by the results of the analyses conducted.

5.5 Descriptive Statistics

Table 1 lists the descriptive statistics for all of the variables used in the current chapter. As shown, the average age of participants in the sample was 14.34. The participants in the sample were 55% female; half were White (50%). Additionally, 15% of respondents reported alcohol use, 13% reported e-cigarette use, 3% reported cigarette use, and 10% reported marijuana use. The use of individual hard drugs was quite low, with inhalants, LSD, depressants, prescription pain killers, over the counter drugs, and amphetamines showing minimal usage. In addition, 6% of the sample reported carrying a handgun within the past 12 months.

Further, 34% of respondents reported easy access to marijuana and alcohol, while 28% reported easy access to cigarettes. Only 10% of respondents reported easy access to hard drugs and 18% reported easy access to handguns. The mean value for unstructured socializing with peers is 3.40, meaning that most participants in the sample report spending approximately 5 to 8 hours per week hanging out with their friends with no adult present.

Additionally, most of the respondents in the sample had grades of mostly A’s and B’s, skipped school 0 or 1 days in the last four weeks, did not have friends who used

drugs, believed that using drugs is wrong, and had friends that feel that using drugs is wrong. Furthermore, most of the respondents' had high levels of self-control, had parents who felt that substance use is wrong, and lived in neighborhoods with low levels of neighborhood disorder. They also had moderate levels of bonds at school, high levels of bonds with parents, higher levels of parental monitoring, and were mostly never suspended from school. Last, 35% of respondents had family members with drug or alcohol problems, most believed that carrying handguns is wrong, and had high levels of parental monitoring when it came to handgun carrying. Below are the results for all of the analyses conducted in this chapter to assess mediation.

Table 1: Descriptive Statistics (N = 34,654)

	%	Mean	SD	Min	Max
Dependent Variables					
Variety Index for Soft Drug Use		0.41	0.85	0	4
30-Day Cigarette Use (Yes = 1)	3%	---	---	0	1
30-Day E-cigarette Use (Yes = 1)	13%	---	---	0	1
30-Day Alcohol Use (Yes = 1)	15%	---	---	0	1
30-Day Marijuana Use (Yes = 1)	10%	---	---	0	1
Variety Index for Hard Drug Use		0.09	0.44	0	11
30-Day Inhalant Use (Yes = 1)	2%	---	---	0	1
30-Day Methamphetamine Use (Yes = 1)	0%	---	---	0	1
30-Day Club Drug Use (Yes = 1)	0%	---	---	0	1
30-Day LSD Use (Yes = 1)	1%	---	---	0	1
30-Day Cocaine/Crack Use (Yes = 1)	0%	---	---	0	1
30-Day Depressants Use (Yes = 1)	1%	---	---	0	1
30-Day Prescription Pain Killer Use (Yes = 1)	1%	---	---	0	1
30-Day Over the Counter Drug Use (Yes = 1)	2%	---	---	0	1
30-Day Amphetamine Use (Yes = 1)	1%	---	---	0	1
30-Day Steroid Use (Yes = 1)	0%	---	---	0	1
30-Day Heroin Use (Yes = 1)	0%	---	---	0	1
12-Month Handgun Carrying (Yes = 1)	6%	--	--	0	1
Independent Variable					
Unstructured Socializing with Peers		3.40	3.77	0	13
Mediating Variables					
Variety Index for Ease of Access to Soft Drugs		0.96	1.17	0	3
Ease of Access to Alcohol (Easy = 1)	34%	---	---	0	1
Ease of Access to Cigarettes (Easy = 1)	28%	---	---	0	1
Ease of Access to Marijuana (Easy = 1)	34%	---	---	0	1
Ease of Access to Hard Drugs (Easy = 1)	10%	---	---	0	1
Ease of Access to Handguns (Easy = 1)	18%	---	---	0	1
Covariates					
Age		14.34	1.99	10	19
Gender (Male = 1)	45%	---	---	0	1
White (Yes = 1)	50%	---	---	0	1
Black (Yes = 1)	15%	---	---	0	1
Hispanic (Yes = 1)	23%	---	---	0	1
Other Race (Yes = 1)	13%	---	---	0	1
Good Grades		3.16	0.87	0	4
Skipped School		0.83	1.45	0	6
Peer Substance Use		0.58	0.87	0	4
Attitudes Favorable of Substance Use		0.52	0.65	0	3
Peer Approval of Substance Use		0.53	0.70	0	3
Low self-control		1.02	0.64	0	3
Parental Approval of Substance Use		0.17	0.39	0	3
Neighborhood Disorder		0.42	0.60	0	3
Bonds at School		0.02	0.37	-2.0	1.5
Bonds with Parents		2.00	0.72	0	3
Parental Monitoring		2.25	0.65	0	3
School Suspension		0.11	0.45	0	7
Family Alcohol/Drug Problems (Yes = 1)	35%	---	---	0	1
Attitudes Favorable of Handgun Carrying		0.17	0.49	0	3
Parental Monitoring for Handgun Carrying		2.27	1.03	0	3

5.6 Results

I. Soft Drug Use

Table 2 presents the series of negative binomial regressions of unstructured socializing predicting the variety index of soft drug use with ease of access as a mediating variable. Results for each of the four models pertaining to the effects of independent variables were interpreted in terms of the coefficient and converted to a percent change using the transformation:

$$[100 \text{ x } (e^{\beta x \delta} - 1)]$$

where β is the estimate, and δ is the unit change in the independent variable. Since all variables, with the exception of dichotomously measured variables, have been standardized, δ = 1. As shown in Model 1, a one standard deviation increase in unstructured socializing results in a 8% increase [100 x ($e^{0.08x1} - 1$)] in ease of access to soft drugs (b = 0.08, $p < .001$). This provides evidence that unstructured socializing has a positive effect on ease of access to soft drugs.

Model 2 examines the effect unstructured socializing has on soft drug use without accounting for the effect of the mediator. According to the model, a one standard deviation increase in unstructured socializing results in a 19% increase [100 x ($e^{0.17x1} - 1$)] in soft drug use (b = 0.17, $p < .001$). Thus, evidence is found that unstructured socializing has a positive effect on the use of soft drugs. In Model 3, where ease of access to soft drugs is predicting soft drug use, it can be seen that the ease of access to soft drugs has a positive association with soft drug use. Specifically, a one standard deviation increase in the ease of access to soft drugs results in a 43% increase [100 x ($e^{0.36x1} - 1$)] in soft drug use (b = 0.36, $p < .001$). This supports the idea that the ease of access to

substances is a salient predictor of substance use as previous literature has established (Alter et al., 2006; Keyes et al., 2011).

Last, in Model 4, the mediator is added to help explain the association between unstructured socializing and the use of soft drugs. As per the model, it can be seen that a positive association between unstructured socializing and soft drug use remains. However, a one standard deviation increase in unstructured socializing now results in a 15% increase [100 x ($e^{0.14x1}$ – 1)] in soft drugs use (b = 0.14, $p < .001$). Therefore, partial mediation of the relationship between unstructured socializing and soft drug use can be seen with a drop in the coefficient from 0.17 in Model 2 to 0.14 in Model 4, when the mediator is added as a covariate. Thus, evidence is found supporting the first hypothesis, and the effect of unstructured socializing with peers on the variety index of soft drug use is partially mediated by ease of access; approximately 18% mediation is observed. Therefore, the effect of unstructured socializing with peers on the variety index of soft drug use is reduced by 18% through ease of access.

Additionally, in Model 4, several other variables are also notably associated with soft drug use. Specifically, age, skipping school, peer substance use, own approval of substance use, low self-control, school suspension, and having family members with alcohol or drug problems were all positively associated with soft drug use. On the contrary, being male, Black, Hispanic, and of multiple races, having good grades, neighborhood disorder, and greater parental monitoring were negatively associated with soft drug use.

Table 2: Negative Binomial Regressions of Soft Drug Use on Unstructured Socializing with Ease of Access as a Mediating Variable

Predictors	Model 1: Ease of Access to Soft Drugs		Model 2: Variety Index for Soft Drug Use		Model 3: Variety Index for Soft Drug Use		Model 4: Variety Index for Soft Drug Use	
	b	RSE	b	RSE	b	RSE	b	RSE
USWP	0.08***	0.01	0.17***	0.01	---	---	0.14***	0.01
Ease of Access to Soft Drugs	---	---	---	---	0.36***	0.01	0.34***	0.01
Age	0.27***	0.01	0.23***	0.01	0.15***	0.01	0.15***	0.01
Male	-0.06***	0.01	-0.12***	0.02	-0.08***	0.02	-0.10***	0.02
Black[a]	-0.15***	0.02	-0.36***	0.03	-0.32***	0.03	-0.30***	0.03
Hispanic[a]	-0.05**	0.01	-0.11***	0.03	-0.11***	0.03	-0.10***	0.03
Other Race[a]	-0.08***	0.02	-0.17***	0.03	-0.16***	0.03	-0.16***	0.03
Good Grades	0.06***	0.01	-0.03**	0.01	-0.04***	0.01	-0.05***	0.01
Skipped School	-0.01*	0.01	0.05***	0.01	0.06***	0.01	0.05***	0.01
Peer Drug Use	0.15***	0.01	0.40***	0.01	0.35***	0.01	0.33***	0.01
Own Attitudes Toward Drugs	0.11***	0.01	0.34***	0.01	0.30***	0.01	0.30***	0.01
Peer Attitudes Toward Drugs	0.10***	0.01	0.04**	0.01	0.01	0.01	0.01	0.01
Low self-control	0.13***	0.01	0.15***	0.01	0.13***	0.01	0.11***	0.01
Parental Approval of Drug Use	0.19***	0.00	0.03**	0.01	0.01	0.01	0.01	0.01
Neighborhood Disorder	0.10***	0.00	-0.03**	0.01	-0.05***	0.01	-0.05***	0.01
Bonds at School	0.01	0.02	0.00	0.03	0.00	0.03	0.00	0.03
Bonds with Parents	-0.03***	0.01	0.03**	0.01	0.05***	0.01	0.03*	0.01
Parental Monitoring	-0.04***	0.01	-0.13***	0.01	-0.14**	0.01	-0.12***	0.01
School Suspension	0.00	0.01	0.04***	0.01	0.04***	0.01	0.04***	0.01
Family Alcohol/Drug Problems	0.22***	0.01	0.14***	0.02	0.10***	0.02	0.09***	0.02
X^2	8102.30***		6116.91***		7650.12***		7775.70***	
Nagelkerke R^2	0.15		0.25		0.26		0.26	

Notes. N = 34,654. [a] reference group is White; USWP = unstructured socializing with peers; RSE = robust standard error adjusted for clustering within 685 schools; * p < .05 ** p < .01 *** p < .001

II. Hard Drug Use

Next, potential mediation of the relationship between unstructured socializing and hard drug use was examined. Table 3 presents the series of logistic and negative binomial regressions of unstructured socializing predicting hard drug use with ease of access as a mediating variable. Results for the negative binomial models pertaining to the effects of the independent variable were interpreted in terms of the coefficient and converted to a percent change in hard drug use using the transformation:

$$[100 \text{ x } (e^{\beta x \delta} - 1)]$$

where β is the estimate, and δ is the unit change in the independent variable. Because the measures have been standardized, $\delta = 1$. Results for the logistic regression model were interpreted in terms of the odds ratio.

As shown in Model 1, where unstructured socializing predicts the ease of access to hard drugs, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of easy access to hard drugs by 20% ((1.20 - 1) x 100). This provides evidence that unstructured socializing has a positive effect on ease of access to hard drugs.

In Model 2, the effect of unstructured socializing on the variety index of hard drug use is estimated without the effect of the mediator. As shown in Model 2, a one standard deviation increase in unstructured socializing results in a 8% increase [100 x ($e^{0.08x1} - 1$)] in hard drug use ($b = 0.08$, $p < .01$). Thus, evidence is found to support the positive association between unstructured socializing and the use of hard drugs. Then, in Model 3, ease of access to hard drugs is used to predict the use of hard substances. It can

be seen that the ease of access to hard drugs has a positive association with hard drug use. Having easy access to hard drugs results in a 54% increase [100 x ($e^{0.43x1}$ – 1)] in hard drug use (b = 0.43, $p < .001$). This supports the idea that adolescents who report easier access to hard substances are more likely to use hard substances.

Last, in Model 4, when the mediator is added to the model that displays the effect that unstructured socializing has on the use of hard substances, it can be seen that there is still a positive association between unstructured socializing and hard drug use. However, a one standard deviation increase in unstructured socializing now results in a 6% increase [100 x ($e^{0.06x1}$ – 1)] in hard drug use (b = 0.06, $p < .01$). Thus, partial mediation can be seen with a drop in the coefficient from 0.08 in Model 2 to 0.06 in Model 4, when the mediator is added to the model. Therefore, evidence is again found supporting the first hypothesis, and the effect of unstructured socializing with peers on the variety index of hard drug use is partially mediated by ease of access; approximately 25% mediation is observed. Therefore, the effect of unstructured socializing with peers on the variety index of hard drug use is reduced by 25% through ease of access.

Additionally, in Model 4, several other variables are associated with hard drug use. Specifically, skipping school, peer substance use, own approval of substance use, peer approval of substance use, low self-control, parental approval of substance use, neighborhood disorder, school suspension, and having family members with alcohol or drug problems were all positively associated with hard drug use. Conversely, age, being male, bonds with parents, and greater parental monitoring were negatively associated with hard drug use.

Table 3: Logistic and Negative Binomial Regressions of Hard Drug Use on Unstructured Socializing with Ease of Access as a Mediating Variable

Predictors	Model 1: Ease of Access to Hard Drugs (Logistic)			Model 2: Variety Index for Hard Drug Use (Negative Binomial)		Model 3: Variety Index for Hard Drug Use (Negative Binomial)		Model 4: Variety Index for Hard Drug Use (Negative Binomial)	
	b	RSE	OR	b	RSE	b	RSE	b	RSE
USWP	0.18***	0.02	1.20	0.08**	0.02		--	0.06**	0.02
Ease of Access to Hard Drugs			--		--	0.43***	0.06	0.42***	0.05
Age	0.36***	0.02	1.43	-0.34***	0.03	-0.35***	0.03	-0.36***	0.03
Male	-0.00	0.04	1.00	-0.21***	0.05	-0.20***	0.05	-0.21***	0.05
Black[a]	-0.10	0.07	0.90	0.18*	0.08	0.17*	0.08	0.18*	0.08
Hispanic[a]	0.16**	0.05	1.18	0.06	0.07	0.04	0.07	0.05	0.07
Other Race[a]	0.21**	0.06	1.23	0.11	0.09	0.09	0.09	0.10	0.09
Grades	0.05*	0.02	1.06	-0.03	0.03	-0.03	0.03	-0.03	0.03
Skipped School	0.05*	0.02	1.05	0.10***	0.02	0.10***	0.02	0.09***	0.02
Peer Drug Use	0.37***	0.02	1.45	0.38***	0.03	0.36***	0.03	0.36***	0.03
Own Attitudes Toward Drugs	0.23***	0.03	1.26	0.27***	0.03	0.26***	0.03	0.25***	0.03
Peer Attitudes Toward Drugs	0.12***	0.03	1.13	0.21***	0.03	0.21***	0.03	0.21***	0.03
Low self-control	0.10***	0.02	1.10	0.40***	0.03	0.40***	0.03	0.39***	0.03
Parental Approval of Drug Use	0.05**	0.02	1.05	0.07***	0.02	0.07***	0.02	0.07***	0.02
Neighborhood Disorder	0.30***	0.02	1.35	0.09***	0.03	0.08**	0.03	0.08**	0.03
Bonds at School	-0.12*	0.06	0.89	-0.20*	0.08	-0.19*	0.08	-0.19*	0.08
Bonds with Parents	-0.04	0.03	0.97	-0.09**	0.03	-0.09**	0.03	-0.10**	0.03
Parental Monitoring	-0.10***	0.03	0.91	-0.15***	0.04	-0.16***	0.04	-0.15***	0.04
Suspension	0.05**	0.02	1.05	0.06***	0.02	0.06**	0.02	0.06**	0.02
Family Alcohol/Drug Problems	0.26***	0.04	1.30	0.25***	0.06	0.24***	0.06	0.24***	0.06

X^2	3343.57***	3845.11***	4043.39***	4053.22***
Nagelkerke R^2	0.21	0.18	0.18	0.19

Notes. N = 34,654. [a] reference group is White; *b* = unstandardized logistic regression coefficient; RSE = robust standard error adjusted for clustering within 685 schools; OR = odds ratio; * p < .05 ** p < .01 *** p < .001

III. Handgun Carrying

The next series of models were estimated to assess whether ease of access to handguns mediates the unstructured socializing and handgun carrying relationship. Table 4 presents the series of logistic regression models for unstructured socializing predicting handgun carrying with ease of access to handguns as the mediating variable. Results for the four models pertaining to the effect of the independent variables were interpreted in terms of the odds ratios.

Model 1 estimates the effect of unstructured socializing on the ease of access to handguns. As shown in Model 1, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of easy access to handguns by 16%. Thus, evidence is found that unstructured socializing has a positive effect on ease of access to handguns.

Model 2 examines the effect that unstructured socializing has on handgun carrying, without the consideration of the mediator. As shown, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of handgun carrying by 20%. This provides evidence that unstructured socializing has a positive effect on handgun carrying. Then, in Model 3, ease of access to handguns is modeled as a predictor of handgun carrying. It can be seen that while controlling for the other independent variables included in the model, easy access to handguns increases the odds of handgun carrying by 522%. This finding supports the notion that the ease of access to handguns enables youth to carry them, as previous literature has demonstrated (Komro, 1999). Thus, evidence is found that ease of access to handguns has a positive effect on handgun carrying.

Last, in Model 4, the effect of unstructured socializing on handgun carrying is estimated when the mediator is added as a covariate, and it can be seen that there is still a positive association between unstructured socializing and handgun carrying. However, while controlling for the other independent variables included in the model, unstructured socializing now increases the odds of handgun carrying by only 14%. Thus, partial mediation can be seen with a decrease in the coefficient from 0.18 in Model 2 to 0.13 in Model 4, when the mediator is added as a covariate. Therefore, evidence is found supporting the second hypothesis, and the effect of unstructured socializing with peers on handgun carrying is partially mediated by ease of access to handguns; approximately 28% mediation is observed. Therefore, the effect of unstructured socializing with peers on handgun carrying is reduced by 28% through ease of access.

Additionally, in Model 4, several other variables are associated with handgun carrying. Specifically, skipping school, low self-control, neighborhood disorder, suspension, and own approval of handgun carrying were all positively associated with handgun carrying. Conversely, age, being Black, Hispanic, and of multiple races, having good grades, bonds at school, and greater parental monitoring were negatively associated with handgun carrying.

Table 4: Logistic Regressions of Handgun Carrying on Unstructured Socializing with Ease of Access as a Mediating Variable

	Model 1: Ease of Access to Handguns			Model 2: Handgun Carrying			Model 3: Handgun Carrying			Model 4: Handgun Carrying		
Predictors	*b*	RSE	OR	*b*	RSE	OR	*b*	RSE	OR	*b*	RSE	OR
USWP	0.14***	0.01	1.16	0.18***	0.02	1.20		--		0.13***	0.02	1.14
Ease of Access to Handguns			--			--	1.83***	0.06	6.22	1.81***	0.06	6.09
Age	0.23***	0.02	1.25	-0.05	0.03	0.95	-0.13***	0.03	0.87	-0.15***	0.03	0.86
Male	0.13***	0.03	1.14	0.95***	0.05	2.60	0.97***	0.06	2.64	0.95***	0.06	2.59
Black[a]	-0.63***	0.05	0.53	-0.73***	0.08	0.48	-0.57***	0.08	0.56	-0.55***	0.08	0.58
Hispanic[a]	-0.56***	0.04	0.57	-0.41***	0.06	0.66	-0.25**	0.07	0.82	-0.23***	0.07	0.79
Other Race[a]	-0.25***	0.05	0.78	-0.25**	0.08	0.78	-0.20*	0.08	0.82	-0.19*	0.08	0.83
Grades	0.15***	0.02	1.16	0.03	0.02	1.02	-0.01	0.02	1.00	-0.01	0.02	0.99
Skipped School	0.03**	0.01	1.03	0.08***	0.02	1.08	0.08***	0.02	1.09	0.07**	0.02	1.07
Low self-control	0.44***	0.02	1.55	0.27***	0.02	1.31	0.20***	0.03	1.22	0.18***	0.03	1.20
Neighborhood Disorder	0.50***	0.02	1.64	0.29***	0.02	1.33	0.20***	0.02	1.22	0.19***	0.02	1.21
Bonds at School	-0.10*	0.05	0.90	-0.19**	0.07	0.82	-0.17*	0.07	0.85	-0.16*	0.07	0.85
Bonds with Parents	-0.03	0.02	0.97	0.07**	0.03	1.07	0.08**	0.03	1.09	0.07*	0.03	1.08
Suspension	0.16***	0.03	1.17	0.18***	0.02	1.20	0.18***	0.02	1.20	0.17***	0.02	1.19
Parental Monitoring for Gun Carrying	-0.25***	0.02	0.78	-0.39***	0.02	0.68	-0.33***	0.02	0.72	-0.32***	0.02	0.73
Own Attitudes of Handgun Carrying	0.45***	0.03	1.56	0.22***	0.02	1.25	0.15***	0.02	1.17	0.15***	0.02	1.17
X^2	2809.82***			1995.04***			3464.88***			3602.25***		
Nagelkerke R^2	0.10			0.15			0.22			0.22		

Notes. N = 34,654. [a] reference group is White; *b* = unstandardized logistic regression coefficient; RSE = robust standard error adjusted for clustering within 685 schools; OR = odds ratio; * p < .05 ** p < .01 *** p < .001

IV. Supplemental Analyses

As mentioned, supplementary analyses for each of the individual drug use outcomes were also estimated. For the four drugs that were used to create the variety index of soft drug use, individual regressions were estimated. Table 5 presents the logistic regression models for each individual substance. In Model 1, it can be seen that while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of consuming alcohol by 28%. It can also be seen that while controlling for the other independent variables included in the model and for the effect of ease of access to alcohol, a one standard deviation increase in unstructured socializing increases the odds of consuming alcohol by 23%. Additionally, it can also be seen that the effect of unstructured socializing with peers on alcohol consumption is slightly mediated by ease of access to alcohol, as the coefficient decreased from 0.24 to 0.21 when controlling for the mediator; approximately 13% mediation is observed. Therefore, the effect of unstructured socializing with peers on alcohol use is reduced by 13% through ease of access.

In Model 2, it can be seen that while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of smoking cigarettes by 9%. It can also be seen that while controlling for the other independent variables included in the model and for the effect of ease of access to cigarettes, a one standard deviation increase in unstructured socializing increases the odds of smoking cigarettes by 5%. However, it can also be seen that the effect of unstructured socializing with peers on the use of cigarettes is partially mediated by ease of access to cigarettes, as the coefficient decreases from 0.08 to 0.05 and is no

longer statistically significant; approximately 38% mediation is observed. Therefore, the effect of unstructured socializing with peers on cigarette use is reduced by 38% through ease of access.

In Model 3, it can be seen that while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of smoking e-cigarettes by 41%. It can also be seen that while controlling for the other independent variables included in the model and for the effect of ease of access to cigarettes, a one standard deviation increase in unstructured socializing increases the odds of smoking e-cigarettes by 39%. It can also be seen that the effect of unstructured socializing with peers on the use of e-cigarettes is slightly mediated by ease of access to e-cigarettes; the coefficient decreases from 0.34 to 0.33. Only 3% mediation is observed. Therefore, the effect of unstructured socializing with peers on e-cigarette use is reduced by 3% through ease of access.

Last, in Model 4, it can be seen that while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of smoking marijuana by 37%. It can also be seen that while controlling for the other independent variables included in the model and for the effect of ease of access to marijuana, a one standard deviation increase in unstructured socializing increases the odds of smoking marijuana by 31%. Also, the effect of unstructured socializing with peers on smoking marijuana is slightly mediated by ease of access to marijuana, as the coefficient decreases from 0.32 to 0.27; approximately 16% mediation is observed. Therefore, the effect of unstructured socializing with peers on marijuana use is reduced by 16% through ease of access.

Further, Table 6 and 7 present the models for each individual hard drug that was included in the variety index of hard drug use. With so few respondents reporting hard drug use, only a few firm conclusions can be made. It can be seen that unstructured socializing increases the odds of use for LSD by 14%, crack and cocaine by 22%, prescription pain killers by 13%, over the counter drugs by 13%, and steroids by 37%. However, when accounting for the effect of the ease of access to hard drugs, unstructured socializing increases the odds of use for LSD by 9%, crack and cocaine by 18%, prescription pain killers by 12%, over the counter drugs by 13%, and steroids by 34%, mediation of the association between unstructured socializing and hard drug use can only be assessed in several substances.

In Table 6, it can be seen that the effect of ease of access partially meditates the relationship between unstructured socializing and LSD and crack and cocaine. Specifically, in Model 4, it can be seen that the coefficient decreases from 0.13 to 0.09 and is no longer statistically significant, resulting in 31% mediation. In Model 5, it can be seen that there was a drop in the coefficient from 0.20 to 0.16, resulting in 20% mediation. Therefore, the effect of unstructured socializing with peers on LSD and crack and cocaine use is reduced by 31% and 20%, respectively, through ease of access.

In Table 7, it can be seen that the effect of ease of access slightly meditates the relationship between unstructured socializing and steroids. Yet, no mediation can be observed with prescription pain killers and over the counter drugs. Specifically, in Model 10, it can be seen that there was a drop in the coefficient from 0.31 to 0.29 resulting in 6% mediation. Therefore, the effect of unstructured socializing with peers on steroid use is reduced by 6% through ease of access. However, in Model 7 and Model 8, it can be

seen that the coefficients remain 0.12 for models with and without the effect of ease of access to hard drugs, resulting in 0% mediation.

Table 5: Logistic Regressions of Individual Soft Drug Use on Unstructured Socializing with Ease of Access as a Mediating Variable

	Model 1: Alcohol			Model 2: Cigarettes			Model 3: E-Cigarettes			Model 4: Marijuana		
	b	RSE	OR	*b*	RSE	OR	*b*	RSE	OR	*b*	RSE	OR
Effect w/o Ease of Access	0.24***	0.02	1.28	0.08*	0.03	1.09	0.34***	0.02	1.41	0.32***	0.02	1.37
Effect w/ Ease of Access	0.21***	0.02	1.23	0.05	0.03	1.05	0.33***	0.02	1.39	0.27***	0.02	1.31
Percent Mediation	13%			38%			3%			16%		

Notes. N = 34,654. All models account for age, sex, race, grades, skipping school, peer substance use, attitudes favorable of substance use, peer approval of substance use, low self-control, parental approval of substance use, neighborhood disorder, parental monitoring, suspension, and family drug problems; [a] reference group is White; *b* = unstandardized logistic regression coefficient; RSE = robust standard error adjusted for clustering within 685 schools; OR = odds ratio; * p < .05 ** p < .01 *** p < .001

Table 6: Logistic Regressions of Individual Hard Drug Use on Unstructured Socializing with Ease of Access as a Mediating Variable

	Model 1: Inhalants			Model 2: Methamphetamines			Model 3: Club drugs			Model 4: LSD			Model 5: Cocaine/Crack			Model 6: Depressants		
	b	RSE	OR	*b*	RSE	OR	*b*	RSE	OR	*b*	RSE	OR	*b*	RSE	OR	*b*	RSE	OR
Effect w/o Ease of Access	0.02	0.04	1.02	0.15	0.10	1.16	-0.01	0.09	0.99	0.13**	0.06	1.14	0.20*	0.08	1.22	0.08	0.04	1.08
Effect w/ Ease of Access	0.02	0.04	1.02	0.13	0.10	1.14	-0.05	0.09	0.95	0.09	0.06	1.09	0.16*	0.08	1.18	0.05	0.04	1.06
Percent Mediation	0%			13%			0%			31%			20%			38%		

Notes. N = 34,654. All models account for age, sex, race, grades, skipping school, peer substance use, attitudes favorable of substance use, peer approval of substance use, low self-control, parental approval of substance use, neighborhood disorder, parental monitoring, suspension, and family drug problems; [a] reference group is White; *b* = unstandardized logistic regression coefficient; RSE = robust standard error adjusted for clustering within 685 schools; OR = odds ratio; * p < .05 ** p < .01 *** p < .001

Table 7: Logistic Regressions of Individual Hard Drug Use on Unstructured Socializing with Ease of Access as a Mediating Variable Part 2

	Model 7: Prescription Pain Killers			Model 8: Over the Counter Drugs			Model 9: Amphetamines			Model 10: Steroids			Model 11: Heroin		
	b	RSE	OR	*b*	RSE	OR	*b*	RSE	OR	*b*	RSE	OR	*b*	RSE	OR
Effect w/o Ease of Access	0.12**	0.04	1.13	0.12**	0.04	1.13	0.01	0.06	1.01	0.31**	0.11	1.37	0.13	0.18	1.14
Effect w/ Ease of Access	0.12**	0.04	1.12	0.12*	0.04	1.13	-0.00	0.06	1.00	0.29*	0.12	1.34	0.08	0.18	1.08
Percent Mediation	0%			0%			0%			6%			38%		

Notes. N = 34,654. All models account for age, sex, race, grades, skipping school, peer substance use, attitudes favorable of substance use, peer approval of substance use, low self-control, parental approval of substance use, neighborhood disorder, parental monitoring, suspension, and family drug problems; [a] reference group is White; *b* = unstandardized logistic regression coefficient; RSE = robust standard error adjusted for clustering within 685 schools; OR = odds ratio; * p = < .05 ** p = < .01 *** p = < .001

CHAPTER 6

VI. AN EXAMINATION OF THE MODERATING ROLE OF GENDER FOR THE ASSOCIATION BETWEEN UNSTRUCTURED SOCIALIZING WITH PEERS AND USING DRUGS AND CARRYING HANDGUNS

6.1 Introduction

Gender is well established as one of the most important correlates of adolescent delinquency. Typically, males have been classified as being more delinquent than females (Giordano & Cernkovich, 1997; Mears, Ploeger, & Warr, 1998; Rutter, Giller, & Hagell, 1998; Svensson, 2003; Wilson & Herrnstein, 1985). Previous research has also shown that males use drugs more frequently than females (Elliott, Huizinga, & Menard, 1989; Hindelang, Hirschi, & Weis, 1981; Penning & Barnes, 1982). As such, we know that patterns of drug use and other antisocial behavior vary by gender, but the impact that gender has on the pathways to delinquency are still left unclear.

Previous research has demonstrated that youth who socialize with peers in unstructured settings are more likely to engage in deviant behavior. Additionally, it has been established that the association between unstructured socializing and delinquency holds across both male and female samples (Augustyn & McGloin, 2013; Barnes et al., 2007; Gage et al., 2005; Goldstein et al., 2005; Lam et al., 2014; Steketee, 2012; Weerman et al., 2015b; Yin et al., 1999). However, some findings remain unclear, with some studies suggesting that: (1) the effect of unstructured socializing on delinquency is stronger for males than for females (Novak & Crawford, 2010; Sentse et al., 2010), (2) others indicating the relationship is stronger for females (Galambos & Maggs, 1991; Block, Swartz & Copenhaver, 2019), and (3) still others finding that both females and

males derive similar risk of delinquency from unstructured socializing (Augustyn & McGloin, 2013; Barnes et al., 2007; Gage et al., 2005; Lotz & Lee, 1999). These inconsistent findings may be due to the fact that previous measures of unstructured socializing with peers failed to sufficiently capture all components of the construct, with some measures only addressing times per week (e.g., not at all, once a week, 2-3 times, and 5 or more), rather than more specific hourly increments (Augustyn & McGloin, 2013).

Therefore, it is crucial for criminologists to further develop the means for understanding and explaining gender differences among adolescents in order to better understand the influence that gender has on notable associations between unstructured socializing and both substance use and handgun carrying. Thus, the aim of this chapter is to contribute to the literature by investigating the moderating effects that gender may have on the unstructured socializing–substance use and unstructured socializing–handgun carrying relationships.

6.2 The Importance of Gender

I. Unstructured Socializing and Gender

The characteristics and circumstances of leisure time differ vastly for male and female adolescents (Athenstaedt, Mikola, & Bredt, 2009; Eder & Parker, 1987; Hilbrecht, Zizanek, & Mannell, 2008). The differences in contexts and settings under which socializing occurs can result in noticeably diverse experiences stemming from unstructured socializing with peers between males and females. These varied experiences may create differential effects in the risk that unstructured socializing poses for deviant

behavior. However, gender may condition the degree to which this risk promotes and enables delinquent behavior for various reasons.

Osgood et al. (1996) recognized that adolescents might be differentially susceptible to the risk posed by the exposure to unstructured socializing. They acknowledged that unsupervised activities may cause varying levels of delinquency, and while some individuals can be greatly impacted by the risk, others might not be as impacted, if impacted at all. Since gender typically directs the type of social activities youth engage in (Connell, 1987; Giddens, 1984; Maccoby, 1988, 1990; Ruble, Martin, & Berenbaum, 2006), including choices in leisure time and deviance, researchers have investigated whether females and males systematically vary in their vulnerability to the risk that accompanies the exposure to unstructured activities.

Preliminary findings suggest that males and females have a degree of difference in exposure to this risk, particularly because males spend lengthier periods of time engaged in unstructured activities with friends than females (Larson & Richards, 1991). Additionally, males are known for engaging in more risky behaviors, especially when socializing in unsupervised peer groups (Larson, Richards, Sims, & Dworkin, 1998). This speaks to the idea that males and females are socialized differently, which results in their distinct choices during adolescence for leisure time, delinquent behaviors, and even occupational choices (Augustyn & McGloin, 2013).

a. Socialization

Society has an unwritten rule book that defines a set of norms by which behaviors are deemed acceptable. These norms are also used to dictate the type of attributes and behaviors that are tolerable, which differ vastly for males and females (Harris, 1977;

Heimer, 1996; Schur, 1984). These societal standards heavily influence the way parents socialize, sanction, and stigmatize their children based on their acceptance of these guidelines, or their choice to rebel and deviate from the rules. This results in differing patterns of socialization across gender during childhood, which reflect different choices regarding leisure time and delinquency during adolescence.

i. Female Socialization

It is often the case that the socialization of boys and girls is quite different, with expectations for how girls are to behave as distinct from expectations for how boys are to behave. For example, it is expected that females should "do no harm," and, therefore, should not engage in certain types of behavior, such violence and predatory crime. This insinuates that violence is not consistent with the feminine identity, and is behavior that is discouraged and unacceptable (Augustyn & McGloin, 2013). Despite that Osgood and colleagues (1996) concluded how situations that are favorable to this type of deviance among youth are particularly prevalent during unstructured activities because of the lack of social control, still this may be challenged with the idea of female socialization. Put differently, even though unstructured socializing with peers may enhance the possibility for deviance, it may also be conditioned by socialization (Anderson & Hughes, 2009). Female adolescents may possess greater internal restraint against certain forms of delinquency to a degree that male adolescents do not, due to due to female socialization, which taught them that delinquency is contradictory to femininity. (Augustyn & McGloin, 2013; Bottcher, 1995, 2001; Heimer, 1996; Heimer & DeCoster, 1999).

Moreover, societal norms and expectations of appropriate female behavior also emphasize domestic duties, which tend to be centered around an individual's home where

guardians are likely to be present (Bottcher, 2001; Green, Hebron, & Woodward, 1990; Larson & Richards, 1991). Additionally, it is assumed that female adolescents are at a far greater risk than males to be victimized, which results in greater levels of parental monitoring for girls than boys (Philipp, 1998; Schur, 1984). Typically, parents are clear with their rules on when and where females can socialize with their friends, as opposed to males. Males are often granted greater levels of freedom when socializing with friends, while females usually have socialization with peers observed much more closely. This type of monitoring has a direct impact on a teenager's time spent in, and access to, leisure activities outside of the home (Augustyn & McGloin, 2013; Philipp, 1998; Schur, 1984).

In general, females are subject to earlier curfews than their male counterparts to prevent possible exposure to victimization, especially at night (Bottcher, 1995). Thus, female socialization is typically accompanied by many limitations regarding where and when said socializing can occur, which limits socializing among girls to indoor activities that are associated with higher levels of guardianship (Philipp, 1998). In addition to at home activities, females are often allowed to hang out in shopping malls. In line with the idea that females need to be under stricter surveillance, these locations contain their own set of restrictions and codes of standard to abide by. Shopping malls have security cameras and security guards that are used in place of parental guardianship to enforce social control, further reducing the appeal of or ability to engage in delinquent behavior. Consistent with Osgood and colleagues' (1996) arguments, shopping and socializing at home were deemed to be less risky forms of leisure time in regards to enabling delinquency (Augustyn & McGloin, 2013).

Further, since violence is not aligned with the qualities and attributes that are acceptable for female behavior, stealing, acting aggressively, and causing harm are deviations from societal norms on what is considered feminine. However, activities such as engaging in drug and alcohol use do not directly harm others and are not an example of violent crime (Athenstaedt et al., 2009; Wearing et al., 1994). On this point, previous research has supported findings that suggest females engage in various forms of substance use, however, findings have been inconsistent. Some research suggests that females engage in less substance use than males, and others suggest that adolescent males and females engage in similar rates of substance use (Augustyn & McGloin, 2013; Moffitt, Caspi, Rutter, & Silva, 2001; Richardson, Radziszewska, Dent, & Flay, 1993). However, as discussed above, since females tend to spend most of their leisure time at home, it may be that their exposure to this type of unstructured socializing would result in a higher rate of use for substances that could be acquired at home, such as alcohol and cigarettes.

ii. Male Socialization

Relative to females, males are exposed to an entirely different standards of socialization. While females are discouraged from engaging in violent behavior, the idea of male identity and masculinity is often accompanied by delinquency, assertiveness, and aggression (Augustyn & McGloin, 2013; Messerschmidt, 1993). Often, male socialization and culture emphasizes aggression, toughness, risk-seeking, dominance, and physical strength (Augustyn & McGloin, 2013; Leaper & Friedman, 2007; Pleck, Sonenstein, & Ku, 1994; Perry & Pauletti, 2011; Wearing, Wearing, & Kelly, 1994). Juvenile male culture tends to create and accept competitive pursuits, which can overlap

with delinquent behavior. This ideology, coupled with unstructured socializing and the presence of male group membership peer-pressure, makes it challenging for male adolescents to completely reject engagement in delinquent behavior. Further, if males decide to reject the delinquent recommendations of their male peers, their status in the peer group can be threatened, they may be viewed as weak, and their manhood could be jeopardized (Augustyn & McGloin, 2013; Leaper & Friedman, 2007; Warr, 2002).

Due to the type of socialization and norms that adolescent males are exposed to, it has been established that males are more likely to participate in athletic and physical activities with their peers that further accentuate the opportunities for competition, achievement, and dominance (Bottcher, 2001; Eder & Parker, 1987; Larsonet al., 1998; (Larson & Richards, 1991; Maccoby, 1990; Perry & Pauletti, 2011). Additionally, since adolescent males are given more freedom and exposed to lower levels of parental control relative to females, they often favor leisure time that is away from the home. Males often socialize in places such as neighborhood streets and public parks (Bottcher, 1995, 2001; Fitzgerald, Joseph, Hayes, & O'Regan, 1995; McRobbie, 1978; Perry & Pauletti, 2011). Since these locations are away from home, sometimes require transportation, and are less supervised, adolescent males are frequently exposed to more opportunities that facilitate delinquent behavior (Bottcher, 1995, 2001; Felson, 2002; Hirschi, 1986).

Furthermore, since exposure to unstructured and unsupervised socializing with peers increases the likelihood of delinquency among males, this could suggest that males will have increased levels of delinquent behavior and participation in criminal activity. In addition, the more time adolescent boys spend hanging in the streets and attending parties, the more likely they are to participate in fighting, and other forms of violent

behavior (Hughes & Short, 2014). Moreover, since boys tend to associate with friends in public places, it is more common for them to get access to various substances and firearms, and be exposed to gangs (Hughes & Short, 2014). So, while females might still engage in moderate levels of delinquent behavior and substance use, the chance for adolescent boys to engage in predatory crime, various forms of substance use, and handgun carrying is likely much higher due to their socialization coupled with the exposure to unstructured activities.

II. Gender Differences in Substance Use

It is of no surprise that much of the previous research on juvenile substance use has indicated that gender is a significant factor for drug and alcohol use among youth. Many studies on substance use conclude that males are more likely to use and abuse than females, with a few studies finding mixed results (Degenhardt & Hall, 2001; Downing & Bellis, 2009; Ensminger, Juon & Fothergill, 2002; Espelage, Low, Rao, Hong & Little, 2014; Johnson, Phelps & Cottler, 2004; Leatherdale & Burkhalter, 2012; Lynne-Landsman, Graber, Nichols & Botvin, 2011; Moore & Chudley, 2005; Warr, 1998; Young, Corley, Stallings, Rhee, Crowley & Hewitt, 2002). Studies have also confirmed that the more time spent with friends predicts more frequent use of substances, such as marijuana and alcohol (Augustyn & McGloin, 2013; Barnes, Hoffman, Welte, Farrell, & Dintcheff, 2007; Flannery, Williams, & Vazsonyi, 1999; Greene & Banerjee, 2009; Hawdon, 1999; Meldrum & Leimberg, 2018; Miller, 2013; Osgood et al., 1996; Warr, 1998).

Additionally, though infrequent, the association between unstructured socializing with peers and substance use across gender has been noted. When investigating the

relationship between gender, the amount of time spent with friends, and tobacco, marijuana, alcohol, and other illicit drugs use, it has been found that there was a positive correlation between unstructured socializing and substance use. However, the association was found to be stronger for boys than for girls, meaning that joint activities among adolescents without the presence of authority figures have a stronger impact on the probability of substance use among adolescent boys than girls (Barnes et al., 2007; Leban & Gibson, 2020). Particularly, for both boys and girls, unstructured socializing with peers was positive and significantly associated with an increase in the odds of substance use. However, the effect was only minimally stronger for boys (OR = 1.22, $p < .05$ for girls and OR = 1.25, $p < .05$ for boys) (Leban & Gibson, 2020).

Furthermore, other studies found that informal socializing with peers was just as likely to lead to substance use for female adolescents as it was for males, which may be the result of access to such substances in many home environments (Augustyn & McGloin, 2013). Even more, Gage and colleagues (2005) concluded that both adolescent boys and girls who reported spending most evenings out were more likely than those spending fewer evenings out to consume alcohol and smoke tobacco.

Moreover, it was also found that males spending most evenings out were over 3 times more likely to consume alcohol and smoke than boys who spent a few evenings out. Yet, the risks of frequent substance use among females spending most evenings out were over 7 times greater than those spending few evenings out for frequent alcohol consumption and almost 5 times greater for frequent smoking (Gage et al., 2005). Thus, when investigating gender differences in the association between unstructured socializing, it is clear that this line of research merits more attention. The inconclusive

and mixed results suggest that gender should be further examined as a moderator of the unstructured socializing – substance use relationship. Additionally, the consideration for a wider array of substances as outcome variables is warranted.

Since most current studies indicated that that the effect of unstructured socializing may be stronger for adolescent males than females when evaluating substance use, coupled with the idea that male socialization teaches boys to be more delinquent than girls, in this study, it is predicted that the effect of unstructured socializing on substance use will be amplified for male adolescents.

III. Gender Differences in Handgun Carrying

Previous studies on weapon carrying have suggested that gender was a meaningful factor for carrying weapons among adolescents, and that males were more likely to carry than females (Cao, Zhang, & He, 2008; Dukes, Stein, & Zane, 2010; Durant, Getts, Cadenhead, & Woods, 1995; Ferguson & Cricket Meehan, 2010; Gilreath, Astor, Cederbaum, Atuel, & Benbenishty, 2014; Hemenway, Prothrow-Stith, Bergstein, Ander, & Kennedy, 1996; Kodjo, Auinger, & Ryan, 2003; Kulig, Valentine, Griffith, & Ruthazer, 1998; Lizotte, Krohn, Howell, Tobin, & Howard, 2000; Meldrum, Jackson, Zgoba & Testa, 2020; Orpinas, Basenengquist, Grunbaum, & Parcel, 1995; Stayton, McVeigh, Olson, Perkins, & Kerker, 2011; Vaughn et al., 2012; Walsh et al., 2013; Wright & Fitzpatrick, 2006). However, previous research has primarily focused on the predictors of general weapon carrying, and frequently grouped together weapons like knives, guns, and other weapons such as box cutters or brass knuckles to assess weapon carrying without making a distinction between weapon carrying and handgun carrying (Dijkstra, Lindenberg, Veenstra, Steglich, Isaacs, Card & Hodges, 2010).

Recently, being male and spending more time in unstructured activities have both been found to be positively associated with handgun carrying (Meldrum, Jackson, Zgoba & Testa, 2020). Thus, given the idea that unstructured socializing and being male both increase the risk of carrying handguns, coupled with the idea that male socialization encourages boys to be more aggressive and assertive than girls, it is predicted that the effect of unstructured socializing on handgun carrying will be amplified for male adolescents. Moreover, after an extensive literature search, I did not locate any other studies that examine the association between unstructured socializing with peers and both general weapon carrying or handgun carrying more specifically.

6.3 The Current Investigation

As explained in Chapter 3, this chapter focuses on examining whether there are gender differences in the effect of unstructured socializing with peers on both substance use and handgun carrying among adolescents. This chapter tests the third and fourth hypotheses. The third hypothesis tests the effect of unstructured socializing with peers (IV) on substance use (DV) when moderated by gender (MoV). It is anticipated that being male will amplify the effect of unstructured socializing with peers on substance use. The fourth hypothesis tests the effect of unstructured socializing with peers (IV) on handgun carrying (DV) when moderated by gender (MoV). It is anticipated that being male will amplify the effect of unstructured socializing with peers on handgun carrying. The analytical strategy and results for this chapter are presented below.

6.4 Analytical Strategy

All models for this chapter are estimated using STATA 15.1 and the cluster option. Hence, robust standard errors are reported that adjust for the clustering of the participants within the 686 schools. The cluster option takes into account the non-independence of having students from within the same schools participate in the FYSAS. This correction has no influence on the coefficients, but rather it adjusts the standard errors to account for the non-independence.

As outlined in Chapter 3, this study will test research questions three and four, which examine potential gender differences in the effect that unstructured socializing with peers has on both substance use and handgun carrying. The third hypothesis tests the effect of unstructured socializing with peers (IV) on substance use (DV) when moderated by gender (MoV). It is anticipated that being male will amplify the effect of unstructured socializing with peers on substance use. The fourth hypothesis tests the effect of unstructured socializing with peers (IV) on handgun carrying (DV) when moderated by gender (MoV). It is anticipated that being male will amplify the effect of unstructured socializing with peers on handgun carrying.

In order to ease the interpretation of the results pertaining to the effect gender has on the relationship between unstructured socializing with peers and both substance use and handgun carrying, all of the independent and control variables that were not dichotomized were standardized. Standardizing variables is an important process that puts variables on a uniform scale, which then allows the ability to compare effect sizes. Additionally, regression models typically have an excessive amount of multicollinearity, which can mask statistically significant effects, and sometimes cause coefficients to

switch signs. Fortunately, standardizing variables is also an easy way to reduce multicollinearity and its associated consequences.

The original sample in the 2018 FYSAS contained 54,611 cases. After removal of cases with missing data across each of the variables utilized in this chapter, the sample was reduced to 34,654. The cases that had missing values were completely deleted from the sample. While more advanced methods for handling missing data could have been employed, for this dissertation I elected to use the available data without any imputation procedures, since the sample remained large after the removal of cases with missing data.

In order to assess if data loss is correlated with variables such as age, sex, and race, I used statistical methods to assess differences between my sample of 34,654 youth and the 19,957 youth that were excluded from the analyses because of listwise deletion. In order to do this, I created a dummy variable called "missing" before deleting any data, where a "0" represented the youth that were included in my sample and a "1" represented the youth that were not included. Following this, I ran tests to assess whether the percent for sex (male) and race (white) are different on the missing variable (chi-square test) and whether the average for age is different on the missing variable (t-test).

Considering that with listwise deletion approximately 37% of the 54,611 cases in the data file were lost, slight to moderate differences can be observed across the age, sex, and race variables. For the sex variable, the sample that is excluded from my analysis consists of 55% males as opposed to 45% males in the sample that is included ($\chi 2 = 443.46$, $p < .001$). This means that males were more likely to be excluded from my analysis. When analyzing differences on the race variable, the sample that is excluded from my analysis consists of 63% non-white participants, and the sample that is included

consists of 51% non-white participants ($\chi 2 = 794.09$, $p < .001$). This means that racial minorities were more likely to be excluded from my analysis. Last, the differences between the included and excluded samples for age were small though statistically significant, with a mean age of 14.34 in the sample of included respondents, and mean age of 14.05 in the sample with the excluded respondents ($t = 16.09$, $p < .001$). This indicates that younger respondents were more likely to be excluded from my analytic sample.

After the removal of missing data, a series of negative binomial and logistic regression models were estimated using the two variety index drug classifications (i.e., soft drug use and hard drug use) and handgun carrying measures as outcome variables, the standardized measure of unstructured socializing with peers as the primary predictor variable, gender as the moderating variable, and all of the aforementioned covariates. Additionally, individual analyses for each of the drugs comprising the soft drug variety index were also estimated. Given that so few participants reported use of each of the individual hard drugs, and that the results from Chapter 5 for each of the individual hard drug use models were, for the most part, not statistically significant, I did not estimate these models in the present chapter.

For the purpose of this chapter, and in order to assess whether gender moderates the relationship between unstructured socializing with peers and both substance use and handgun carrying, a split-sample analysis (by gender) was conducted to assess whether the effect of unstructured socializing on each of the outcomes is significantly different across male and female samples. For the count outcomes, such as the variety index variables, negative binomial regression was utilized, and for the dichotomized outcomes,

logistic regression is used. To formally assess whether the coefficient for unstructured socializing was statistically different in the male vs female models, the Paternoster et al. (1998) test of equality was used. The formula for this statistical test is:

$$Z = \frac{b_1 - b_2}{\sqrt{SEb_1^2 + SEb_2^2}}$$

In the formula, b_1 and b_2 refer to the two coefficients in question and SEb_1 and SEb_2 refer to their corresponding standard errors. Below, the descriptive statistics are presented for each of the variables used in this chapter, followed by the results of the analyses conducted.

6.5 Descriptive Statistics

Table 1 lists the descriptive statistics for all of the variables used in the current chapter. As shown, the average age of participants in the sample was 14.34. The participants in the sample were 55% female; half were White (50%). Additionally, 15% of respondents reported alcohol use, 13% reported e-cigarette use, 3% reported cigarette use, and 10% reported marijuana use. In addition, 6% of the sample reported carrying a handgun within the past 12 months.

Further, 34% of respondents reported easy access to marijuana and alcohol, while 28% reported easy access to cigarettes. Only 10% of respondents reported easy access to hard drugs and 18% reported easy access to handguns. It is also interesting to note that the mean value for unstructured socializing with peers is 3.40, meaning that most

participants in the sample report spending approximately 5 to 8 hours per week hanging out with their friends with no adult present.

Additionally, most of the respondents in the sample had grades of mostly A's and B's, skipped school 0 or 1 days in the last four weeks, did not have friends who used drugs, believed that using drugs is wrong, and had friends that feel that using drugs is wrong. Furthermore, most of the respondent's had high levels of self-control, had parents who felt that substance use is wrong, and lived in neighborhoods with low levels of neighborhood disorder. They also had moderate levels of bonds at school, high levels of bonds with parents, high levels of parental monitoring, and were mostly never suspended from school. Last, 35% of respondents had family members with drug or alcohol problems, most believed that carrying handguns is wrong, and had high levels of parental monitoring when it came to handgun carrying.

Since the focus of this chapter is to investigate gender differences in the effect that unstructured socializing has on substance use and handgun carrying, Table 2 presents the descriptive statistics by gender, which allows for the observation of differences between males and females in each of the analysis variables.

Table 1: Descriptive Statistics (N = 34,654)

	%	Mean	SD	Min	Max
Dependent Variables					
Variety Index for Soft Drug Use		0.41	0.85	0	4
30-Day Cigarette Use (Yes = 1)	3%	---	---	0	1
30-Day E-cigarette Use (Yes = 1)	13%	---	---	0	1
30-Day Alcohol Use (Yes = 1)	15%	---	---	0	1
30-Day Marijuana Use (Yes = 1)	10%	---	---	0	1
Variety Index for Hard Drug Use		0.09	0.43	0	11
12-Month Handgun Carrying (Yes = 1)	6%	--	--	0	1
Independent Variable					
Unstructured Socializing with Peers		3.40	3.77	0	13
Moderating Variable					
Gender (Male = 1)	45%	---	---	0	1
Covariates					
Age		14.34	1.99	10	19
White (Yes = 1)	50%	---	---	0	1
Black (Yes = 1)	15%	---	---	0	1
Hispanic (Yes = 1)	23%	---	---	0	1
Other Race (Yes = 1)	13%	---	---	0	1
Good Grades		3.16	0.87	0	4
Skipped School		0.83	1.45	0	6
Peer Substance Use		0.58	0.87	0	4
Attitudes Favorable of Substance Use		0.52	0.65	0	3
Peer Approval of Substance Use		0.53	0.70	0	3
Low self-control		1.02	0.64	0	3
Parental Approval of Substance Use		0.17	0.39	0	3
Neighborhood Disorder		0.42	0.60	0	3
Bonds at School		0.02	0.37	-2.0	1.5
Bonds with Parents		2.00	0.72	0	3
Parental Monitoring		2.25	0.65	0	3
School Suspension		0.12	0.45	0	7
Family Alcohol/Drug Problems (Yes = 1)	35%	---	---	0	1
Attitudes Favorable of Handgun Carrying		0.17	0.49	0	3
Parental Monitoring for Handgun Carrying		2.27	1.03	0	3
Variety Index for Ease of Access to Soft Drugs		0.96	1.17	0	3
Ease of Access to Alcohol (Easy = 1)	34%	---	---	0	1
Ease of Access to Cigarettes (Easy = 1)	28%	---	---	0	1
Ease of Access to Marijuana (Easy = 1)	34%	---	---	0	1
Ease of Access to Hard Drugs (Easy = 1)	10%	---	---	0	1
Ease of Access to Handguns (Easy = 1)	18%	---	---	0	1

I. Descriptive Statistics by Gender

Table 2 lists the descriptive statistics by gender, as well as the p-values for the chi-square test and t-test results for each variable. As can be seen, the total sample of 34,654 youth is composed of 15,725 males and 18,929 females. According to the chi-square test and t-test results, many of the differences in variables are statistically significant. Males in the sample are slightly older ($t = 2.90$, $p < .01$), and more frequently reported being White ($\chi2 = 5.24$, $p < .05$) and of another race ($\chi2 = 28.58$, $p < .001$) than females. On the other hand, females more frequently reported being Black ($\chi2 = 35.81$, $p < .001$). However, the difference between genders with the Hispanic variable is not statistically significant.

Additionally, females reported higher grades ($t = 22.95$, $p < .001$), higher frequency of skipping school ($t = 4.76$, $p < .001$), greater levels of friends who use substances ($t = 4.78$, $p < .001$), lower levels of self-control ($t = 4.70$, $p < .001$), living in more disorganized neighborhoods ($t = 4.97$, $p < .001$), higher bonds at school ($t = 3.19$, $p < .01$), and higher levels of parental monitoring in general ($t = 13.38$, $p < .001$), and monitoring in regard to handguns ($t = 22.98$, $p < .001$). However, males reported higher levels of drug use approval ($t = 2.65$, $p < .01$) and having friends who approved drug use ($t = 11.94$, $p < .001$), had greater bonds with parents ($t = 4.66$, $p < .001$), greater occurrence of school suspension ($t = 12.76$, $p < .001$), and higher levels of handgun carrying approval ($t = 9.04$, $p < .001$).

It can also be observed that while both males and females have the same percentage of marijuana (10%) and cigarette use (3%), they differ in usage of e-cigarettes

and alcohol. Males have greater levels of e-cigarette use ($\chi 2 = 5.79$, $p < .05$) and females drink alcohol at higher rates than males ($\chi 2 = 37.62$, $p < .001$).

Further, male respondents in the sample are more likely to carry handguns ($\chi 2 = 529.99$, $p < .001$) and reported having easier access to handguns ($\chi 2 = 47.99$, $p < .001$) than females. However, females reported having easier access to alcohol ($\chi 2 = 18.68$, $p < .001$) and marijuana ($\chi 2 = 32.46$, $p < .001$). Females also reported more instances of having family members with alcohol and drug problems ($\chi 2 = 229.76$, $p < .001$). Lastly, and most importantly, males in the sample engaged in more unstructured socializing peer week ($t = 13.66$, $p < .001$) than females, which may result in their high levels handgun carrying. Below are the results for all the analyses conducted in this chapter to assess moderation.

Table 2: Descriptive Statistics by Gender

	Males (N = 15,725)					Females (N = 18,929)					Chi-square test and T-test P Values
	%	Mean	SD	Min	Max	%	Mean	SD	Min	Max	
Dependent Variables											
Variety Index for Soft Drug Use		0.41	0.86	0	4		0.42	0.85	0	4	
30-Day Cigarette Use (Yes = 1)	3%	---	---	0	1	3%	---	---	0	1	
30-Day E-cigarette Use (Yes = 1)	14%	---	---	0	1	13%	---	---	0	1	*
30-Day Alcohol Use (Yes = 1)	14%	---	---	0	1	16%	---	---	0	1	***
30-Day Marijuana Use (Yes = 1)	10%	---	---	0	1	10%	---	---	0	1	
Variety Index for Hard Drug Use		0.08	0.45	0	11		0.09	0.42	0	11	*
12-Month Handgun Carrying (Yes = 1)	10%	--	--	0	1	4%	--	--	0	1	***
Independent Variable											
Unstructured Socializing with Peers		3.70	3.89	0	13		3.15	3.65	0	13	***
Covariates											
Age		14.38	2.01	10	19		14.32	1.97	10	19	**
White (Yes = 1)	50%	---	---	0	1	49%	---	---	0	1	*
Black (Yes = 1)	13%	---	---	0	1	16%	---	---	0	1	***
Hispanic (Yes = 1)	23%	---	---	0	1	23%	---	---	0	1	
Other Race (Yes = 1)	14%	---	---	0	1	12%	---	---	0	1	***
Good Grades		3.05	0.88	0	4		3.26	0.84	0	4	***
Skipped School		0.79	1.42	0	6		0.87	1.47	0	6	***
Peer Substance Use		0.56	0.88	0	4		0.61	0.85	0	4	***
Attitudes Favorable of Substance Use		0.53	0.67	0	3		0.51	0.63	0	3	**
Peer Approval of Substance Use		0.57	0.73	0	3		0.49	0.66	0	3	***
Low self-control		1.00	0.64	0	3		1.03	0.65	0	3	***
Parental Approval of Substance Use		0.17	0.39	0	3		0.17	0.39	0	3	
Neighborhood Disorder		0.40	0.58	0	3		0.44	0.61	0	3	***
Bonds at School		0.01	0.38	-2.0	1.5		0.03	0.37	-2.0	1.5	**
Bonds with Parents		2.02	0.71	0	3		1.99	0.73	0	3	***
Parental Monitoring		2.20	0.67	0	3		2.29	0.62	0	3	***
School Suspension		0.14	0.51	0	7		0.08	0.38	0	7	***
Family Alcohol/Drug Problems (Yes = 1)	31%	---	---	0	1	39%	---	---	0	1	***
Attitudes Favorable of Handgun Carrying		0.19	0.54	0	3		0.15	0.45	0	3	***
Parental Monitoring for Handgun Carrying		2.14	1.09	0	3		2.39	0.95	0	3	***
Variety Index for Ease of Access to Soft Drugs		0.93	1.18	0	3		0.99	1.17	0	3	***

Ease of Access to Alcohol (Easy = 1)	33%	---	---	0	1	35%	---	---	0	1	***
Ease of Access to Cigarettes (Easy = 1)	28%	---	---	0	1	28%	---	---	0	1	
Ease of Access to Marijuana (Easy = 1)	33%	---	---	0	1	36%	---	---	0	1	***
Ease of Access to Hard Drugs (Easy = 1)	10%	---	---	0	1	10%	---	---	0	1	
Ease of Access to Handguns (Easy = 1)	20%	---	---	0	1	17%	---	---	0	1	***

6.6 Results

I. Soft Drug Use

As discussed previously, this chapter utilizes a split-sample analysis to examine the moderating effect of gender on the association between unstructured socializing and soft drug use. Table 3 presents the results for the series of negative binomial regression models of unstructured socializing predicting the variety index of soft drug use by gender.

Model 1 displays the results for the male sample. As shown in Model 1, a one standard deviation increase in unstructured socializing results in a 13% increase [100 x ($e^{0.12x1} - 1$)] in soft drug use for males (b = 0.12, $p < .001$). Model 2 displays the results for the female sample. As shown in Model 2, a one standard deviation increase in unstructured socializing results in a 16% increase [100 x ($e^{0.15x1} - 1$)] in soft drug use for females (b = 0.15, $p < .001$). Therefore, this suggests that the association between unstructured socializing and soft drug use is marginally stronger for females.

When calculating the equality of the coefficient for the effect (Paternoster et al., 1998) of unstructured socializing on soft drug use it can be seen that the difference in coefficients is statistically significant (z = -2.35, $p < .05$). Therefore, it can be concluded that the effect of unstructured socializing on soft drug use significantly varies by gender. This supports the notion that gender moderates the association between unstructured socializing and soft drug use, but does not support the third hypothesis, which suggested the effect would be stronger for males.

Table 3: Negative Binomial Regression of Soft Drug Use on Unstructured Socializing by Gender

Predictors	Model 1: Variety Index for Soft Drug Use (Males)		Model 2: Variety Index for Soft Drug Use (Females)	
	b	RSE	b	RSE
USWP	0.12***	0.01	0.15***	0.01
Age	0.11***	0.02	0.19***	0.02
Black[a]	-0.32***	0.05	-0.28***	0.04
Hispanic[a]	-0.10**	0.04	-0.10**	0.03
Other Race[a]	-0.18***	0.05	-0.13**	0.04
Good Grades	-0.07***	0.01	-0.03*	0.01
Skipped School	0.04**	0.01	0.05***	0.01
Peer Drug Use	0.34***	0.01	0.32***	0.01
Own Attitudes Toward Drugs	0.29***	0.02	0.29***	0.02
Peer Attitudes Toward Drugs	0.02	0.02	0.01	0.02
Low self-control	0.09***	0.02	0.13***	0.01
Parental Approval of Drug Use	0.02*	0.01	0.00	0.01
Neighborhood Disorder	-0.04**	0.01	-0.06***	0.01
Bonds at School	0.08*	0.04	-0.07*	0.03
Bonds with Parents	0.06***	0.02	0.00	0.01
Parental Monitoring	-0.12***	0.02	-0.11***	0.02
School Suspension	0.05***	0.01	0.01	0.01
Family Alcohol/Drug Problems	0.04	0.03	0.13***	0.03
Variety Index for Ease of Access to Soft Drugs	0.35	0.02	0.32***	0.02
X^2	4979.71***		6380.41***	
Nagelkerke R^2	0.27		0.27	

Notes. N = 15,725 for Males. N = 18,929 for Females. [a] reference group is White; USWP = unstructured socializing with peers; RSE = robust standard error adjusted for clustering within 685 schools; * p < .05 ** p < .01 *** p < .001

II.Hard Drug Use

A split-sample analysis was again conducted to examine the moderating effect of gender on the association between unstructured socializing and hard drug use. Table 4 presents the results for the series of negative binomial regression models of unstructured socializing predicting the variety index of hard drug use by gender.

Model 1 displays the results for the male sample and Model 2 shows the results for the female sample. As shown in Model 1, a one standard deviation increase in unstructured socializing results in a 9% increase [100 x ($e^{0.09x1}$ – 1)] in hard drug use for males (b = 0.09, $p < .01$). Further, in Model 2, it can be seen that being female has a positive effect on hard drugs use, but the effect is not statistically significant. Thus, the effect of unstructured socializing on hard drug use may be amplified for males.

When calculating the equality of the coefficient for the effect of unstructured socializing on hard drug use it can be seen that the difference in coefficients is not statistically significant (z = 0.80, p > .05). Thus, it can be concluded that the effect of unstructured socializing on hard drug use does not significantly vary by gender. This is inconsistent with hypothesis three.

Table 4: Negative Binomial Regression of Hard Drug Use on Unstructured Socializing by Gender

Predictors	Model 1: Variety Index for Hard Drug Use (Males)		Model 2: Variety Index for Hard Drug Use (Females)	
	b	RSE	b	RSE
USWP	0.09**	0.04	0.05	0.03
Age	-0.33***	0.06	-0.38***	0.04
Black[a]	0.14	0.13	0.19	0.10
Hispanic[a]	0.08	0.11	0.01	0.08
Other Race[a]	0.04	0.14	0.13	0.11
Good Grades	-0.01	0.04	-0.05	0.03
Skipped School	0.15***	0.04	0.06*	0.03
Peer Drug Use	0.38***	0.04	0.33***	0.03
Own Attitudes Toward Drugs	0.25***	0.06	0.24***	0.04
Peer Attitudes Toward Drugs	0.27***	0.04	0.24***	0.04
Low self-control	0.34***	0.05	0.43***	0.04
Parental Approval of Drug Use	0.10**	0.03	0.04	0.02
Neighborhood Disorder	0.10*	0.04	0.07*	0.03
Bonds at School	-0.12	0.12	-0.24*	0.10
Bonds with Parents	-0.02	0.05	-0.15***	0.04
Parental Monitoring	-0.19**	0.06	-0.13**	0.05
School Suspension	0.09***	0.02	0.02	0.02
Family Alcohol/Drug Problems	0.27**	0.09	0.24**	0.07
Ease of Access to Hard Drugs	0.46***	0.10	0.38***	0.08
X^2	1985.03***		2405.54***	
Nagelkerke R^2	0.20		0.18	

Notes. N = 15,725 for Males. N = 18,929 for Females. [a] reference group is White; USWP = unstructured socializing with peers; RSE = robust standard error adjusted for clustering within 685 schools; * p < .05 ** p < .01 *** p < .001

III.Handgun Carrying

To examine the moderating effect of gender on the association between unstructured socializing and handgun carrying, a split-sample analysis was again conducted. Table 5 presents the results for the series of logistic regressions of unstructured socializing predicting handgun carrying by gender.

Model 1 displays the results for the male sample, while Model 2 presents the results for the female sample. According to the first model, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of handgun carrying by 13% (OR = 1.13, $p <$ .001) for males. However, as shown in Model 2, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of handgun carrying by 16% (OR = 1.16, $p <$ .001) for females.

Further, when calculating the equality of the coefficient for the effect of unstructured socializing on handgun carrying it can be seen that the difference in coefficients ($z = -0.55$, $p > 05$) is not statistically significant. Thus, it can be concluded that the effect of unstructured socializing on handgun carrying does not significantly vary by gender. Therefore, this suggests that gender does not moderate the association between unstructured socializing and handgun carrying. These results are contradictory to hypothesis 4, which assumed that the effect would be greater for males.

Table 5: Logistic Regression of Handgun Carrying on Unstructured Socializing by Gender

	Model 1: Handgun Carrying (Males)			Model 2: Handgun Carrying (Females)		
Predictors	*b*	RSE	OR	b	RSE	OR
USWP	0.12***	0.03	1.13	0.15***	0.04	1.16
Age	-0.11***	0.03	0.89	-0.21*	0.05	0.81
Black[a]	-0.51***	0.09	0.60	-0.72***	0.14	0.54
Hispanic[a]	-0.33***	0.08	0.72	-0.06	0.11	0.94
Other Race[a]	-0.24**	0.09	0.78	-0.06	0.14	0.94
Grades	-0.00	0.03	1.00	-0.02	0.04	0.98
Skipped School	0.09**	0.03	1.09	0.02	0.04	1.02
Low self-control	0.18***	0.03	1.19	0.18***	0.05	1.20
Neighborhood Disorder	0.19***	0.03	1.21	0.19***	0.05	1.21
Bonds at School	-0.24**	0.08	0.78	-0.01	0.13	0.99
Bonds with Parents	0.10**	0.04	1.10	0.05	0.05	1.05
Suspension	0.15***	0.02	1.17	0.22***	0.03	1.24
Parental Monitoring for Gun Carrying	-0.28***	0.03	0.76	-0.39***	0.04	0.67
Own Attitudes of Handgun Carrying	0.12***	0.02	1.13	0.22***	0.03	1.25
Ease of Access to Handguns	1.70***	0.07	5.48	2.02***	0.10	7.50
X^2	1710.86***			1196.40***		
Nagelkerke R^2	0.18			0.22		

Notes. N = 15,725 for Males. N = 18,929 for Females. [a] reference group is White; USWP = unstructured socializing with peers; RSE = robust standard error adjusted for clustering within 685 schools; * p < .05 ** p < .01 *** p < .001

IV. Supplemental Analyses

A split-sample analysis was again conducted to examine the moderating effect of gender on the association between unstructured socializing and the individual soft drugs. Table 6 presents the results for the series of logistic regressions of unstructured socializing predicting alcohol and cigarette use by gender.

Model 1 and Model 2 display the results for alcohol consumption. Model 1 displays the results for the male sample. According to Model 1, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of alcohol consumption by 17% (OR = 1.17, $p < .001$) for males. As shown in Model 2, which presents the results for the female sample, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of alcohol consumption by 27% (OR = 1.27, $p < .001$) for females. Therefore, this suggests that the association between unstructured socializing and alcohol consumption is stronger for females. However, this is contradictory to hypothesis 3, which suggested that the effect would be greater for males.

When calculating the equality of the coefficient for the effect of unstructured socializing on alcohol consumption it can be seen that the difference in coefficients is statistically significant ($z = -2.35$, $p < .05$). Therefore, it can be concluded that the effect of unstructured socializing on alcohol consumption is statistically stronger among females ($z = -2.35$, $p < .05$). Thus, this supports the idea that being female amplifies the association between unstructured socializing and alcohol use, which is contradictory to hypothesis three.

Model 3 and Model 4 display the results for cigarette use. Model 3 displays the results for the male sample and Model 4 show the results for the female sample. According to Model 3, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of cigarette use by 11% (OR = 1.11, $p < .05$) for males. As shown in Model 4, the effect for females is negative and non-significant. Therefore, this suggests that the association between unstructured socializing and cigarette use may be stronger for males.

When calculating the equality of the coefficient for the effect of unstructured socializing on cigarette usage it can be seen that the difference in coefficients is not statistically significant. Therefore, it can be concluded that the effect of unstructured socializing on cigarette use does not significantly vary by gender ($z = 1.61$, $p > .05$). Consequently, this does not support the idea that being male amplifies the association between unstructured socializing and cigarette use.

Table 7 presents the results for the series of logistic regressions of unstructured socializing predicting the e-cigarette and marijuana use by gender. Model 5 and Model 6 display the results for e-cigarette use. Model 5 displays the results for the male sample, while Model 6 presents the results for the female sample. According to Model 5, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of e-cigarette use by 35% (OR = 1.35, $p < .001$) for males. As shown in Model 6, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of e-cigarette use by 42% (OR = 1.42, $p <$

.001) for females. Therefore, this suggests that the association between unstructured socializing and e-cigarette use may be stronger for females.

When calculating the equality of the coefficient for the effect of unstructured socializing on e-cigarette usage it can be seen that the difference in coefficients is not statistically significant ($z = -1.42$, $p > .05$). Therefore, it can be concluded that the effect of unstructured socializing on e-cigarette usage does not significantly vary by gender. Thus, the argument that gender moderates the association between unstructured socializing and e-cigarette use is not supported.

Model 7 and Model 8 display the results for marijuana use. Model 7 displays the results for the male sample. According to Model 7, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of marijuana usage by 25% (OR = 1.25, $p <$ .001) for males. As shown in Model 8, which displays the results for the female sample, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of marijuana usage by 36% (OR = 1.36, $p < .001$) for females. Therefore, this suggests that the association between unstructured socializing and marijuana usage may be stronger for females.

When calculating the equality of the coefficient for the effect of unstructured socializing marijuana usage it can be seen that the difference in coefficients is not statistically significant. Thus, it can be concluded that the effect of unstructured socializing on marijuana use does not significantly vary by gender ($z = -1.89$, $p > .05$).

Overall, this does not support the idea that gender moderates the association between unstructured socializing and marijuana use.

Table 6: Logistic Regressions of Individual Soft Drug Use on Unstructured Socializing by Gender

	Model 1: Alcohol (Males)			Model 2: Alcohol (Females)			Model 3: Cigarettes (Males)			Model 4: Cigarettes (Females)		
	b	RSE	OR	*b*	RSE	OR	*b*	RSE	OR	*b*	RSE	OR
USWP	0.16***	0.03	1.17	0.24***	0.02	1.27	0.10*	0.05	1.11	-0.01	0.05	0.99

Notes. N = 15,725 for Males. N = 18,929 for Females. All models account for age, race, grades, skipping school, peer substance use, attitudes favorable of substance use, peer approval of substance use, low self-control, parental approval of substance use, neighborhood disorder, parental monitoring, suspension, bonds at school, bonds with parents, ease of access, and family drug problems; [a] reference group is White; *b* = unstandardized logistic regression coefficient; RSE = robust standard error adjusted for clustering within 685 schools; OR = odds ratio; * p < .05 ** p < .01 *** p < .001

Table 7: Logistic Regressions of Individual Soft Drug Use on Unstructured Socializing by Gender Part 2

	Model 5: E-Cigarettes (Males)			Model 6: E-Cigarettes (Females)			Model 7: Marijuana (Males)			Model 8: Marijuana (Females)		
	b	RSE	OR	*b*	RSE	OR	*b*	RSE	OR	*b*	RSE	OR
USWP	0.30***	0.03	1.35	0.35***	0.02	1.42	0.23***	0.03	1.25	0.31***	0.03	1.36

Notes. N = 15,725 for Males. N = 18,929 for Females. All models account for age, race, grades, skipping school, peer substance use, attitudes favorable of substance use, peer approval of substance use, low self-control, parental approval of substance use, neighborhood disorder, parental monitoring, suspension, bonds at school, bonds with parents, ease of access, and family drug problems; [a] reference group is White; *b* = unstandardized logistic regression coefficient; RSE = robust standard error adjusted for clustering within 685 schools; OR = odds ratio; * p < .05 ** p < .01 *** p < .001

CHAPTER 7

VII. AN EXAMINATION OF THE FACTORS THAT CONDITION THE ASSOCIATION BETWEEN UNSTRUCTURED SOCIALIZING AND DRUG USE AND HANDGUN CARRYING

7. 1 Introduction

Given the substantial number of studies supporting the association between unstructured socializing and general delinquency, it is expected that scholars would be interested in identifying the conditions under which the effect of unstructured socializing on delinquency is either amplified or diminished. Previous research has examined the effects of self-control and impulsivity (LaGrange & Silverman, 1999; Hay & Forrest, 2008; Thomas & McGloin, 2013), community characteristics (Anderson, 2003; Bernburg & Thorlindsson, 2007; Gage et al., 2005; Maimon & Browning, 2010; Pettit et al., 1999), individual background variables such as socioeconomic status, age, race, and gender (Barnes et al., 2007; DiPietro & McGloin, 2012), peer delinquency (Bernburg & Thorlindsson, 2001; Svensson & Oberwittler, 2010; Wikström et al., 2012), parenting-related variables (Bernburg & Thorlindsson, 2007; Galambos & Maggs, 1991, situational conditions (Hoeben & Weerman, 2014), extracurricular activity (Gage et al., 2005), and strain (Op de Beeck & Pauwels, 2010) and how they moderate the unstructured socializing with peers – delinquency relationship.

Although a considerable amount of research has been devoted to investigating the relationship between unstructured socializing with peers and delinquency, far less attention has been devoted to examining the moderators of this relationship, especially pertaining to the outcomes of substance use and handgun carrying. Potential moderating

factors such as bonds with parents, bonds at school, and neighborhood disorder have not been as thoroughly considered for the unstructured socializing – substance use and unstructured socializing – handgun carrying relationships. Thus, examining these associations with greater specificity would enhance our understanding of the conditions under which unstructured socializing increases delinquency, substance use, and handgun carrying, explanations that are currently lacking in previous literature. In addition, this research would also hold important theoretical and policy-relevant implications that can encourage the reduction of antisocial behavior among adolescents and help support them during their developmental phases to maturity.

7.2 Importance of Neighborhood Disorder

Neighborhood disorder, typically defined by the presence of community-level stressors such as poverty, unemployment or underemployment, signs of neighborhood decay, limited resources, abandoned buildings, substandard housing, buildings in disrepair, litter, and graffiti, has long been associated with high crime rates and delinquency (Calvert, 2002). It is of no surprise that a large volume of studies have supported the link between adolescents residing in neighborhoods characterized by high levels of disorder and their likelihood of participating in delinquent behavior (Attar, Guerra, & Tolan, 1994; Dubow, Edwards, & Ippolito, 1997; Gonzales, Cauce, Friedman, & Mason, 1996; Gorman-Smith, 2000; Johnson, Jang, Li, & Larson., 2000; Leventhal & Brooks-Gunn, 2000; Vowell & Howell, 1998).

Living in disordered neighborhoods can have significant impacts on delinquency, substance use, and crime among adolescents. As individuals develop through adolescence and mature into adults, the neighborhood grows in importance as a significant source of

influence (Kulis, Marsiglia, Sicotte & Nieri, 2007). The type of neighborhood in which an adolescent resides has been found to influence patterns of substance use and deviant behavior among adolescents (Duncan, Duncan & Strycker, 2002; Crum, Lillie-Blanton & Anthony, 1996; Elliott, et. al., 1996). Neighborhoods characterized as "disadvantaged," "unstable," "crime-ridden," and "disorganized" tend to be places where informal social control is low. This results in neighborhoods where crime and poverty are high, gang presence is visible and gang-related crime is high, drugs are easier to get, and neighborhood attitudes are perceived by residents to be more pro-drug use (Kadushin, Reber, Saxe & Livert, 1998). Thus, disordered neighborhoods present many risks for adolescents. In these neighborhood contexts, children are less safe, less protected by parents and other adults, and more subject to peer influences to engage in substance use and other delinquent behavior (Kulis et al., 2007).

I. Unstructured Socializing and Neighborhood Disorder

Previous research has investigated the potential interaction in the prediction of delinquency between unstructured socializing, neighborhood disorder, and community structure and instability. It has been noted that in neighborhoods where adolescents experience social disorganization, such as residential mobility, family disruption, or low socioeconomic status, involvement in unstructured peer activity may be more likely to produce opportunities and situational motivation for delinquency (Bernburg and Thorlindsson, 2001; Bernburg & Thorlindsson, 2007; Rice & Smith, 2002). Specifically, it has been established that unstructured socializing is strongly related to delinquency among adolescents enrolled in schools with higher levels of instability, residential mobility, and family disruption (Bernburg & Thorlindsson, 2007).

Furthermore, other neighborhood characteristics such as collective efficacy, which orients toward the control of local public space, have been examined. According to Sampson (2002), collective efficacy refers to the "monitoring of spontaneous play groups among children, the willingness to intervene in preventing acts such as truancy and street corner 'hanging' by teenage peer-groups, and confronting persons who are exploiting or disturbing public space." Specifically, Maimon & Browning (2010) theorized that the existence of informal social control mechanisms at the neighborhood level, such as collective efficacy, can play a vital role in both counteracting the development and occurrence of unstructured socializing with peers as well as impacting the possibility that these activities will result in delinquency. Based on their data, they concluded that unstructured socializing was more likely to result in violence among adolescents who resided in neighborhoods with lower levels of collective efficacy (Maimon & Browning, 2010).

Additionally, previous studies have recognized that unstructured activities are associated with greater risk for involvement in violence and aggression (Gage et al., 2005). This risk is increased among those adolescents that report lower perceptions of neighborhood safety and trust. In particular, Gage and colleagues (2005) found that unstructured socializing is strongly associated with delinquency among youth who reside in neighborhoods recognized as "unsafe". This underscores the importance of better understanding unsupervised activities among adolescents and the relationships between involvement in problem behaviors and neighborhood contexts (Gage et al., 2005; Pettit et al., 1999).

Moreover, since the effect of unstructured socializing with peers on general delinquency is often stronger for adolescents who resided in neighborhoods with lower levels of collective efficacy and in neighborhoods rated as unsafe (Bernburg & Thorlindsson, 2007; Gage et al., 2005; Maimon & Browning, 2010; Pettit et al., 1999), the premise that adolescents who reside in unsafe, chaotic, and crime ridden neighborhoods, while also spending unsupervised time with their peers, will be more likely to engage in substance use, is expected to extend to handgun carrying. As previous literature suggests, neighborhood disorder and handgun carrying are positively associated (Meldrum et al., 2020).

As evidenced, there is a variety of existing literature that examines how neighborhood variables moderate the relationship between unstructured socializing and delinquency. However, a more thorough investigation of how neighborhood disorder moderates the association between unstructured socializing and both substance use and handgun carrying is relatively absent from the literature. Since much unstructured socializing likely takes place within one's neighborhood, community contexts and structures are a crucial component to further analyze with greater specificity.

7.3 Importance of Bonds with Parents and School

The perspective of social bonding theory emphasizes that weak attachment and commitment to conventional institutions is an important source of delinquent behavior (Hirschi, 1969). According to this perspective, institutions such as the school, the family, and other conventional values and beliefs are the socializing agents that deter delinquent behavior. Adolescents that possess strong ties to these institutions are deterred from engaging in delinquent behavior because they understand and accept the expectations of

societal norms, values, and goals. Additionally, youth that agree with standards of conventional social norms devote themselves to conformity, and thus, the social costs of committing deviant acts are rated higher. Typically, adolescents with higher levels of attachments and bonds tend to reject the attraction of committing deviance. Also, youth who have strong bonds are less likely to see situations as opportunities for delinquency than are those youth who have weaker social bonds (Hirschi, 1969).

Further, the presence of bonds and attachments may impact the frequency of delinquent behavior as well as patterns of routine activities (Hirschi, 1969). For example, adolescents who have strong social ties to school or to their parents are more likely to be supervised and regulated by their parents, teachers, and coaches. With that said, they may be less likely to spend unsupervised time with friends as part of their routine activities. Adolescents that are involved with or attached to conventional agents might have less time to allocate to unstructured socializing with peers. Along this line of thinking, it could be possible that youth who are strongly connected to conventional society deliberately avoid situations that are known to be conducive to deviant behavior, such as unstructured activities (Bernburg & Thorlindsson, 2001). Therefore, an absence of bonding or attachment to institutions or societal agents could generate a positive association between unstructured socializing and deviant behavior, including substance use and handgun carrying.

Moreover, social control variables, such as bonds with parents and at school have been studied as potential moderators of the unstructured socializing-delinquency relationship (Bernburg and Thorlindsson, 2001). However, largely absent from this examination is how these variables moderate the relationship between unstructured

socializing and both substance use and handgun carrying. The examination of these relationships is crucial to further investigate the frequency with which youth find themselves in situations conducive to deviant behavior and may help further explain rates of criminal offending in reference to the combination of unstructured activities and social contexts that create such situations.

I. Unstructured Socializing and Bonds to School

As previous literature suggests, the effect of unstructured socializing with peers on general delinquency is weaker for adolescents who felt stronger bonds to their teachers and school work, did not experience school strain, and participated in extracurricular activities (Bernburg & Thorlindsson, 2001; Gage et al., 2005). Specifically, Bernburg and Thorlindsson (2001) investigated how attachment to school moderated the relationship between unstructured socializing and violence and property offending. They were most interested in assessing whether several school-related variables influenced an adolescent's ability to reject the opportunity for deviance when exposed to situations that were conducive to deviant behavior. They considered the following school-related factors and how they influenced their decision making: feeling that their studies had meaning, feeling excited about going to school, feeling happy about being in school, not wanting to quit school, getting along with their teachers, being prepared for class, liking their school and not wanting to change schools, and being engaged with their school work. They found that the influence of unstructured socializing on violence and property offending was diminished for adolescents with stronger attachments to school (Bernburg & Thorlindsson, 2001).

Further, Müller and colleagues (2013) observed the impacts of school attachment on the relationship between unstructured socializing and shoplifting, vandalism, and assault. They were most interested in seeing if adolescents who enjoyed going to school, found it useful, felt supported, and got along well with their teachers were less likely to engage in delinquent behavior. When assessing the effects of unstructured socializing on different types of delinquency, they found that greater school attachment diminished the effects of unstructured socializing on vandalism and assault, but not shoplifting (Müller, Eisner, & Ribeaud, 2013).

Additionally, previous research has identified predictors of violence and deviant behavior, which include poor school bonding (Communities That Care Youth Survey, 2009). Making students feel appreciated and rewarded for their involvement at school has been associated with a decreased likelihood of their involvement in problem behaviors (Communities That Care Youth Survey, 2009). This is because students who feel appreciated for their activity at school bond to their school, and those students tend to have a decreased risk of engaging in minor and serious delinquency, even when presented with the opportunity during unsupervised activities (Chung et al., 2002; Loeber et al., 2004; Parcel et al., 2010). This may extend to the idea that greater school bonding may decrease youth substance use and handgun carrying due to unstructured socializing because the feeling of attachment to school would discourage adolescents from engaging in delinquent behavior.

II. Unstructured Socializing and Bonds with Parents

As previous literature suggests, the effect of unstructured socializing with peers on general delinquency is weaker for adolescents who experience stronger parental bonds, better and more open relationships with their parents, greater levels of parental monitoring, and greater parental acceptance (Bernburg & Thorlindsson, 2001; Bernburg & Thorlindsson, 2007; Gage et al., 2005; Galambos & Maggs, 1991; Pettit et al., 1999).

To assess the impacts of attachment to conventional social agents, such as family commitment, Bernburg and Thorlindsson (2001) focused on the importance of having a family that spends time together and families where parents are comforting and supportive, and having parents that are easy to talk to. They found that the effect of unstructured socializing on violence and property offending was weaker for adolescents who had a stronger attachment to their families, especially their parents (Bernburg & Thorlindsson, 2007). They then considered the effects of parental monitoring on the relationship between of unstructured socializing and delinquency. They again observed that the effect of unstructured socializing on delinquency was diminished for adolescents whose parents knew their friends and the parents of their friends (Bernburg & Thorlindsson, 2007).

Other studies investigated the effects of adolescent acceptance of parental rules and regulations and approval of firm control on the relationship between unstructured socializing and delinquency. Galambos and Maggs (1991) found a diminished effect of unstructured socializing on delinquency among individuals who reported greater parental acceptance (Galambos & Maggs, 1991). Further, parental monitoring and involvement, and parent-child communication were taken into consideration when attempting to

explain the relationships between unstructured activities and delinquency. Often, time spent together with your family is reserved for evenings, which is crucial to prevent adolescents from being exposed to and involved in problem behaviors. Providing increased opportunity for interaction during dinner, positive parent-child communication, and greater parental involvement and interest have been shown to reduce the risk of involvement in delinquent behaviors (Gage et al., 2005). Gage and colleagues (2005) also found that a diminished effect of unstructured socializing on delinquency was observed for those youth who find it easy to talk to their parents about bothersome issues and for those adolescents whose parents are involved with school.

Furthermore, the role of parents and parenting strategies during adolescence are the most important resources to protect and deter adolescents from various risk factors and for the promotion of healthy development (Fergus & Zimmerman, 2005). Parental monitoring encompasses the ability to keep track of adolescents' whereabouts to prevent them from spending prolonged periods of time in risky, unsupervised settings where the opportunity and risk for delinquency would increase. The quality of the relationship with parents has also been shown to be a protective factor against delinquent behavior (Janssen et al., 2017). For example, those adolescents that value their relationship with their parents are more likely to consider their parents' point of view on their behavior when they are exposed to crime conducive environments, especially during unsupervised activities. However, adolescents who have a more flawed relationship with their parents may not consider their parents' perspective on their behavior and not resist the temptations of criminogenic settings. Thus, previous literature has demonstrated that the effect of unstructured socializing on delinquency is diminished for youth who have a

better relationship with their parents and for adolescents who experience more parental monitoring (Galambos & Maggs, 1991; Janssen et al., 2017; Pettit et al., 1999). This demonstrates the importance for parents to monitor their adolescents' activities outside of the home and to invest in maintaining a relationship of sufficient quality to protect their adolecents from getting involved in delinquent behavior.

Moreover, previous studies demonstrate a strong pattern of protective effects of parental ties, involvement, and supervision on reducing the odds of handgun carrying (Vaughn et al., 2012). Adolescents who carry handguns are far less likely to report a parent being involved in their lives, which would enable the opportunity for more time spent in unsupervised activities with their peers, and thus, may result in more handgun carrying. The opposite is expected to hold true in the current investigation, with adolescents who report parental presence in their lives being more likely to avoid carrying handguns and engaging in substance use.

Overall, numerous studies have previously examined how school and parenting-related variables moderate the relationship between unstructured socializing and delinquency. However, a more thorough investigation of how these variables moderate the association between unstructured socializing and both substance use and handgun carrying is still relatively absent from the literature. The relationships between unstructured socializing and involvement in delinquent behaviors are complex and involve a multitude of interwoven individual, family, community, and societal factors. Thus, it is imperative to more formally investigate neighborhood, school, and parental contexts when examining the relationship between unstructured activities among youth and involvement in problem behaviors.

7.4 The Current Investigation

As explained in Chapter 3, this chapter focuses on examining whether bonds with parents, bonds at school, and neighborhood disorder moderate the effect of unstructured socializing with peers on both substance use and handgun carrying among adolescents. This chapter tests the fifth, sixth, seventh, eighth, ninth, and tenth hypotheses. The fifth hypothesis tests the effect of unstructured socializing with peers (IV) on substance use (DV) while being moderated by social bonds with parents (MoV). It is anticipated that greater bonds and social support from parents will diminish the effect of unstructured socializing with peers on substance use. The sixth hypothesis tests the effect of unstructured socializing with peers (IV) on handgun carrying (DV) while being moderated by social bonds with parents (MoV). It is anticipated that greater bonds and social support from parents will diminish the effect of unstructured socializing with peers on handgun carrying. The seventh hypothesis tests the effect of unstructured socializing with peers (IV) on substance use (DV) while being moderated by bonds at school (MoV). It is anticipated that greater bonds at school will diminish the effect of unstructured socializing with peers on substance use.

The eighth hypothesis tests the effect of unstructured socializing with peers (IV) on handgun carrying (DV) while being moderated by bonds at school (MoV). It is anticipated that greater bonds at school will diminish the effect of unstructured socializing with peers on handgun carrying. The ninth hypothesis tests the effect of unstructured socializing with peers (IV) on substance use (DV) while being moderated by neighborhood disorder (MoV). It is anticipated that greater levels of neighborhood disorder will amplify the effect of unstructured socializing with peers on substance use.

The tenth hypothesis tests the effect of unstructured socializing with peers (IV) on handgun carrying (DV) while being moderated by neighborhood disorder (MoV). It is anticipated that greater levels of neighborhood disorder will amplify the effect of unstructured socializing with peers on handgun carrying. The analytical strategy and results for this chapter are presented below.

7.5 Analytical Strategy

All models for this chapter are estimated using STATA 15.1 and the cluster option. Hence, robust standard errors are reported that adjust for the clustering of the participants within the 686 schools. The cluster option takes into account the non-independence of having students from within the same schools participate in the FYSAS. This correction has no influence on the coefficients, but rather it adjusts the standard errors to account for the non-independence.

As formerly stated in Chapter 3, this third study tests research questions five through ten, which examine whether three social environment variables moderate the effect of unstructured socializing with peers on both substance use and handgun carrying. The moderating variables used in this study are bonds with parents, bonds at school, and neighborhood disorder. As stated in Chapter 3, the fifth hypothesis tests the effect of unstructured socializing with peers (IV) on substance use (DV) while being moderated by social bonds with parents (MoV). It is anticipated that higher bonds and social support from parents will diminish the effect of unstructured socializing with peers on substance use. The sixth hypothesis tests the effect of unstructured socializing with peers (IV) on handgun carrying (DV) while being moderated by social bonds with parents (MoV). It is anticipated higher bonds and social support from parents will diminish the effect of

unstructured socializing with peers on handgun carrying. The seventh hypothesis tests the effect of unstructured socializing with peers (IV) on substance use (DV) while being moderated by bonds at school (MoV). It is anticipated that higher bonds at school will diminish the effect of unstructured socializing with peers on substance use.

Furthermore, the eighth hypothesis tests the effect of unstructured socializing with peers (IV) on handgun carrying (DV) while being moderated by bonds at school (MoV). It is anticipated that higher bonds at school will diminish the effect of unstructured socializing with peers on handgun carrying. The ninth hypothesis tests the effect of unstructured socializing with peers (IV) on substance use (DV) while being moderated by neighborhood disorder (MoV). It is anticipated that greater levels of neighborhood disorder will amplify the effect of unstructured socializing with peers on substance use. Finally, the tenth hypothesis tests the effect of unstructured socializing with peers (IV) on handgun carrying (DV) while being moderated by neighborhood disorder (MoV). It is anticipated that greater levels of neighborhood disorder will amplify the effect of unstructured socializing with peers on handgun carrying.

In order to ease the interpretation of the results pertaining to the effects of the moderating variables on the relationship between unstructured socializing with peers and both substance use and handgun carrying, all of the independent and control variables that were not dichotomized were standardized. Standardizing variables is an important process that puts variables on a uniform scale, which then allows the ability to compare effect sizes. Additionally, regression models typically have an excessive amount of multicollinearity, which can mask statistically significant effects, and sometimes cause

coefficients to switch signs. Fortunately, standardizing variables is also an easy way to reduce multicollinearity and its associated consequences.

The original sample in the 2018 FYSAS contained 54,611 cases. After removal of cases with missing data across each of the variables utilized in this chapter, the sample was reduced to 34,654. The cases that had missing values were completely deleted from the sample. While more advanced methods for handling missing data could have been employed, for this dissertation I elected to use the available data without any imputation procedures, since the sample remained large after the removal of cases with missing data.

In order to assess if data loss is correlated with variables such as age, sex, and race, I used statistical methods to assess differences between my sample of 34,654 youth and the 19,957 youth that were excluded from the analyses because of listwise deletion. In order to do this, I created a dummy variable called "missing" before deleting any data, where a "0" represented the youth that were included in my sample and a "1" represented the youth that were not included. Following this, I ran tests to assess whether the percent for sex (male) and race (white) are different on the missing variable (chi-square test) and whether the average for age is different on the missing variable (t-test).

Considering that with listwise deletion approximately 36% of the 54,611 cases in the data file were lost, slight to moderate differences can be observed across the age, sex, and race variables. For the sex variable, the sample that is excluded from my analysis consists of 55% males as opposed to 45% males in the sample that is included ($\chi 2 = 443.46$, $p < .001$). This means that males were more likely to be excluded from my analysis. When analyzing differences on the race variable, the sample that is excluded from my analysis consists of 63% non-white participants, and the sample that is included

consists of 51% non-white participants ($\chi 2 = 794.09$, $p < .001$). This means that racial minorities were more likely to be excluded from my analysis. Last, the differences between the included and excluded samples for age were small though statistically significant, with a mean age of 14.34 in the sample of included respondents, and mean age of 14.05 in the sample with the excluded respondents ($t = 16.09$, $p < .001$). This indicates that younger respondents were more likely to be excluded from my analytic sample.

After the removal of missing data, a series of negative binomial and logistic regression models were estimated using the two variety index drug classifications (i.e., soft drug use and hard drug use) and dichotomized handgun carrying measures as outcome variables, the standardized measure of unstructured socializing with peers as the primary predictor variable, neighborhood disorder, bonds at school, and bonds with parents as moderating variables, and all of the aforementioned covariates. Additionally, individual analyses for each of the drugs comprising the soft drug variety index were also estimated. Given that so few participants reported use of each of the individual hard drugs, and that the results from Chapter 5 for each of the individual hard drug use models were, for the most part, not statistically significant, I did not estimate these models in the present chapter.

To assess whether bonds with parents, bonds at school, and neighborhood disorder moderate the relationship between unstructured socializing with peers and both substance use and handgun carrying, a split-sample analysis was conducted for each moderating variable to assess whether the effect of unstructured socializing on each of the outcomes is significantly different across the split samples. For the bonds at school

and bonds with parents variables, the sample was split based on the bottom 25% of scores and the top 75% of scores. This decision was made because the risk group for these two variables are those adolescents that report weaker level of bonds. Since these two variables are coded in a way where higher scores represent higher level of bonds, those respondents in the bottom 25% of scores have reported the least amount of bonds. For the neighborhood disorder variable, the sample was split based on the top 25% of scores and the bottom 75% of scores. The decision to split the sample in this manner was made because the risk group for this variable are those adolescents that report the highest amount of disorder in their neighborhoods. Since this variable is coded in a way where higher scores represent higher level of disorder, those respondents in the top 75% of scores have reported the most amount of disorder. For the count outcomes, such as the variety index variables, negative binomial regression was utilized, and for the dichotomized outcomes, logistic regression is used. To formally assess whether the coefficient for unstructured socializing is statistically different across the split samples, the Paternoster et al. (1998) test of equality was used. The formula for this statistical test is:

$$Z = \frac{b_1 - b_2}{\sqrt{SEb_1^2 + SEb_2^2}}$$

In the formula, b_1 and b_2 refer to the two coefficients in question from the split samples and SEb_1 and SEb_2 refer to their corresponding standard errors. Below, the descriptive

statistics are presented for each of the variables used in this chapter, followed by the results of the analyses.

7.6 Descriptive Statistics

Table 1 lists the descriptive statistics for all the variables used in the current chapter. As shown, the average age of participants in the sample was 14.34. The participants in the sample were 55% female; half were White (50%). Additionally, 15% of respondents reported alcohol use, 13% reported e-cigarette use, 3% reported cigarette use, and 10% reported marijuana use. In addition, 6% of the sample reported carrying a handgun within the past 12 months.

Further, 34% of respondents reported easy access to marijuana and alcohol, while 28% reported easy access to cigarettes. Only 10% of respondents reported easy access to hard drugs and 18% reported easy access to handguns. The mean value for unstructured socializing with peers is 3.40, which suggests that the average time per week spent by the participants in the sample hanging out with their friends with no adult present is approximately 5 to 8 hours.

Additionally, most of the respondents in the sample had grades of mostly A's and B's, skipped school 0 or 1 days in the last four weeks, did not have friends who used drugs, believed that using drugs is wrong, and had friends that feel that using drugs is wrong. Furthermore, most of the respondent's possessed high levels of self-control, had parents who felt that substance use is wrong, and lived in neighborhoods with low levels of neighborhood disorder. They also had moderate levels of bonds at school, high levels of bonds with parents, high levels of parental monitoring, and were mostly never suspended from school. Last, 35% of respondents had family members with drug or

alcohol problems, most believed that carrying handguns is wrong, and most had high levels of parental monitoring when it came to handgun carrying.

Table 1: Descriptive Statistics (N = 34,654)

	%	Mean	SD	Min	Max
Dependent Variables					
Variety Index for Soft Drug Use		0.41	0.85	0	4
30-Day Cigarette Use (Yes = 1)	3%	---	---	0	1
30-Day E-cigarette Use (Yes = 1)	13%	---	---	0	1
30-Day Alcohol Use (Yes = 1)	15%	---	---	0	1
30-Day Marijuana Use (Yes = 1)	10%	---	---	0	1
Variety Index for Hard Drug Use		0.09	0.43	0	11
12-Month Handgun Carrying (Yes = 1)	6%	--	--	0	1
Independent Variable					
Unstructured Socializing with Peers		3.40	3.77	0	13
Moderating Variable					
Bonds with Parents		2.00	0.72	0	3
Bonds at School		0.02	0.37	-2.0	1.5
Neighborhood Disorder		0.42	0.60	0	3
Covariates					
Age		14.34	1.99	10	19
Gender (Male = 1)	45%	---	---	0	1
White (Yes = 1)	50%	---	---	0	1
Black (Yes = 1)	15%	---	---	0	1
Hispanic (Yes = 1)	23%	---	---	0	1
Other Race (Yes = 1)	13%	---	---	0	1
Good Grades		3.16	0.87	0	4
Skipped School		0.83	1.45	0	6
Peer Substance Use		0.58	0.87	0	4
Attitudes Favorable of Substance Use		0.52	0.65	0	3
Peer Approval of Substance Use		0.53	0.70	0	3
Low self-control		1.02	0.64	0	3
Parental Approval of Substance Use		0.17	0.39	0	3
Parental Monitoring		2.25	0.65	0	3
School Suspension		0.12	0.45	0	7
Family Alcohol/Drug Problems (Yes = 1)	35%	---	---	0	1
Attitudes Favorable of Handgun Carrying		0.17	0.49	0	3
Parental Monitoring for Handgun Carrying		2.27	1.03	0	3
Variety Index for Ease of Access to Soft Drugs		0.96	1.17	0	3
Ease of Access to Alcohol (Easy = 1)	34%	---	---	0	1
Ease of Access to Cigarettes (Easy = 1)	28%	---	---	0	1
Ease of Access to Marijuana (Easy = 1)	34%	---	---	0	1
Ease of Access to Hard Drugs (Easy = 1)	10%	---	---	0	1
Ease of Access to Handguns (Easy = 1)	18%	---	---	0	1

7.7 Results

I. Bonds with Parents

a. Soft Drug Use

As explained earlier, this chapter utilizes a split-sample analysis to examine the moderating effect of bonds with parents on the association between unstructured socializing and soft drug use. Table 2 presents the results for the series of negative binomial regression models of unstructured socializing predicting the variety index of soft drug use by levels of bonds with parents.

Model 1 displays the results for the respondents in the sample that reported being in the bottom twenty-fifth percentile for bonds with parents. As shown in Model 1, a one standard deviation increase in unstructured socializing results in a 11% increase [100 x ($e^{0.10x1} - 1$)] in soft drug use for adolescents that had weaker bonds with parents (b = 0.10, $p < .001$). Model 2 displays the results for the respondents in the sample that reported being in the top seventy-fifth percentile for bonds with parents. As shown in Model 2, a one standard deviation increase in unstructured socializing results in a 17% increase [100 x ($e^{0.16x1} - 1$)] in soft drug use for adolescents that had stronger bonds with parents (b = 0.16, $p < .001$). Therefore, this suggests that the association between unstructured socializing and soft drug use is amplified for those individuals that reported stronger bonds with parents.

When calculating the equality of the coefficient for the effect (Paternoster et al., 1998) of unstructured socializing on soft drug use, the difference in coefficients is statistically significant (z = -3.85, $p < .001$). Therefore, it can be concluded that the effect of unstructured socializing on soft drug use significantly varies by levels of parental

bond. This supports the idea that bonds with parents moderate the association between unstructured socializing and soft drug use, but does not support the fifth hypothesis. The results suggest that the effect of unstructured socializing on soft drugs use is amplified for youth that have stronger bonds with parents, a finding that is inconsistent with previous research (Bernburg & Thorlindsson, 2001; Bernburg & Thorlindsson, 2007; Gage et al., 2005; Galambos & Maggs, 1991; Pettit et al., 1999).

Table 2: Negative Binomial Regression of Soft Drug Use on Unstructured Socializing by Bonds with Parents

Predictors	Model 1: Variety Index for Soft Drug Use (Bottom 25% of Bonds with Parents)		Model 2: Variety Index for Soft Drug Use (Top 75% of Bonds with Parents)	
	b	RSE	b	RSE
USWP	0.10***	0.01	0.16***	0.01
Age	0.10***	0.02	0.15***	0.01
Male	-0.14***	0.03	-0.08**	0.02
Black[a]	-0.34***	0.05	-0.28***	0.04
Hispanic[a]	-0.12**	0.04	-0.10**	0.03
Other Race[a]	-0.08	0.05	-0.23***	0.04
Good Grades	-0.03*	0.01	-0.05***	0.01
Skipped School	0.05***	0.01	0.04***	0.01
Peer Drug Use	0.30***	0.01	0.34***	0.01
Own Attitudes Toward Drugs	0.23***	0.02	0.34***	0.01
Peer Attitudes Toward Drugs	0.03*	0.02	-0.00	0.02
Low self-control	0.08***	0.02	0.13***	0.01
Neighborhood Disorder	-0.03*	0.01	-0.07***	0.01
Parental Approval of Drug Use	0.01	0.01	0.02	0.01
Bonds at School	0.04	0.04	-0.03	0.03
Parental Monitoring	-0.05**	0.01	-0.14***	0.02
School Suspension	0.04***	0.01	0.03**	0.01
Family Alcohol/Drug Problems	0.10**	0.03	0.09***	0.02
Variety Index for Ease of Access to Soft Drugs	0.26***	0.02	0.35***	0.02
X^2	3897.87***		6666.25***	
Nagelkerke R^2	0.22		0.28	

Notes. N = 8,027 for Bottom 25%. N = 26,627 for Top 75%. [a] reference group is White; USWP = unstructured socializing with peers; RSE = robust standard error adjusted for clustering within 685 schools; * p < .05 ** p < .01*** p < .001

b. Hard Drug Use

To assess the moderating effect of bonds with parents on the association between unstructured socializing and hard drug use, another split-sample analysis was conducted. Table 3 shows the results for the pair of negative binomial regression models of unstructured socializing predicting the variety index of hard drug use by bonds with parents.

Model 1 displays the results for the respondents in the sample that reported being in the bottom twenty-fifth percentile for bonds with parents. As shown in Model 1, the effect of unstructured socializing on hard drug use is positive, but failed to reach statistical significance. However, in Model 2, which displays the results for the respondents in the sample that reported being in the top seventy-fifth percentile for bonds with parents, a one standard deviation increase in unstructured socializing results in a 7% increase [100 x ($e^{0.07x1} - 1$)] in hard drug use for adolescents that had greater bonds with parents ($b = 0.07$, $p < .05$). Therefore, this suggests that the association between unstructured socializing and hard drug use is stronger for those individuals that reported greater bonds with parents.

When calculating the equality of the coefficient for the effect (Paternoster et al., 1998) of unstructured socializing on hard drug use, the difference in coefficients is not statistically significant ($z = -0.13$, $p > .05$). Therefore, it can be concluded that the effect of unstructured socializing on hard drug use does not significantly vary by levels of parental bonds. This does not support the idea that bonds with parents moderates the association between unstructured socializing and hard drug use and does not support the fifth hypothesis.

Table 3: Negative Binomial Regression of Hard Drug Use on Unstructured Socializing by Bonds with Parents

Predictors	Model 1: Variety Index for Hard Drug Use (Bottom 25% of Bonds with Parents)		Model 2: Variety Index for Hard Drug Use (Top 75% of Bonds with Parents)	
	b	RSE	b	RSE
USWP	0.06	0.04	0.07*	0.03
Age	-0.32***	0.06	-0.39***	0.04
Male	-0.26**	0.08	-0.21**	0.07
Black[a]	0.14	0.14	0.19	0.11
Hispanic[a]	-0.03	0.10	0.10	0.09
Other Race[a]	0.16	0.12	0.03	0.11
Good Grades	-0.08*	0.03	0.01	0.04
Skipped School	0.06	0.03	0.10***	0.03
Peer Drug Use	0.32***	0.04	0.38***	0.04
Own Attitudes Toward Drugs	0.26***	0.05	0.24***	0.04
Peer Attitudes Toward Drugs	0.12**	0.04	0.28***	0.04
Low self-control	0.33***	0.04	0.45***	0.04
Neighborhood Disorder	0.10**	0.03	0.07*	0.03
Parental Approval of Drug Use	0.03	0.02	0.11***	0.03
Bonds at School	-0.22	0.12	-0.19*	0.09
Parental Monitoring	-0.19***	0.05	-0.11*	0.05
School Suspension	0.08**	0.02	0.03	0.03
Family Alcohol/Drug Problems	0.21*	0.09	0.27***	0.07
Variety Index for Ease of Access to Hard Drugs	0.33***	0.09	0.50***	0.08
X^2	1393.78***		2359.10***	
Nagelkerke R^2	0.15		0.18	

Notes. N = 8,027 for Bottom 25%. N = 26,627 for Top 75%. [a] reference group is White; USWP = unstructured socializing with peers; RSE = robust standard error adjusted for clustering within 685 schools; * p < .05 ** p < .01 *** p < .001

c. Handgun Carrying

A split-sample analysis was again conducted to assess whether bonds with parents moderated the association between unstructured socializing and handgun carrying. Table 4 presents the results for the pair of logistic regressions of unstructured socializing predicting handgun carrying by bonds with parents.

Model 1 displays the results for the respondents in the sample that reported being in the bottom twenty-fifth percentile for bonds with parents. According to the first model, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of handgun carrying by 16% (OR = 1.16, $p < .001$) for the respondents in the sample that reported having lower bonds with parents. Model 2, which displays the results for the respondents in the sample that reported being in the top seventy-fifth percentile for bonds with parents, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of handgun carrying by 13% (OR = 1.13, $p < .001$). These results suggest that the effect of unstructured socializing on handgun carrying is stronger for youth that reported having lower levels of bonds with parents.

When calculating the equality of the coefficient for the effect (Paternoster et al., 1998) of unstructured socializing on handgun carrying, the difference in coefficients is not statistically significant ($z = 0.61$, $p > .05$). Therefore, it can be concluded that the effect of unstructured socializing on handgun carrying does not significantly vary by levels of parental bonds. This does not support the idea that bonds with parents moderates

the association between unstructured socializing and handgun carrying and does not support the sixth hypothesis.

Table 4: Logistic Regression of Handgun Carrying on Unstructured Socializing by Bonds with Parents

Predictors	Model 1: Handgun Carrying (Bottom 25% of Bonds with Parents)			Model 2: Handgun Carrying (Top 75% of Bonds with Parents)		
	b	RSE	OR	b	RSE	OR
USWP	0.15***	0.04	1.16	0.12***	0.03	1.13
Age	-0.19***	0.05	0.83	-0.14***	0.03	0.87
Male	0.85***	0.10	2.35	1.01***	0.06	2.74
Black[a]	-0.39**	0.13	0.67	-0.59***	0.10	0.55
Hispanic[a]	-0.07	0.11	0.93	-0.30***	0.08	0.74
Other Race[a]	-0.39*	0.15	0.68	-0.11	0.10	0.90
Grades	-0.00	0.04	1.00	-0.01	0.03	0.99
Skipped School	0.05	0.04	1.05	0.08**	0.03	1.08
Low self-control	0.17***	0.05	1.18	0.19***	0.03	1.21
Neighborhood Disorder	0.24***	0.03	1.27	0.16***	0.03	1.18
Bonds at School	-0.12	0.12	0.88	-0.13	0.09	0.87
Suspension	0.23***	0.03	1.26	0.13***	0.02	1.14
Parental Monitoring for Gun Carrying	-0.34***	0.04	0.71	-0.29***	0.03	0.75
Own Attitudes of Handgun Carrying	0.13***	0.03	1.14	0.17***	0.02	1.18
Ease of Access to Handguns	1.63***	0.10	5.09	1.89***	0.07	6.54
X^2	910.68***			2401.49***		
Nagelkerke R^2	0.23			0.22		

Notes. N = 8,027 for Bottom 25%. N = 26,627 for Top 75%. [a] reference group is White; USWP = unstructured socializing with peers; RSE = robust standard error adjusted for clustering within 685 schools; * p < .05 ** p < .01 *** p < .001

II. Bonds at School

a. Soft Drug Use

Another split-sample analysis was conducted to examine the moderating effect of bonds at school on the association between unstructured socializing and soft drug use. Table 5 displays the results for the pair of negative binomial regression models of unstructured socializing predicting the variety index of soft drug use by bonds at school.

Model 1 displays the results for the respondents in the sample that reported being in the bottom twenty-fifth percentile for bonds at school. As shown in Model 1, a one standard deviation increase in unstructured socializing results in a 11% increase [100 x ($e^{0.10x1} - 1$)] in soft drug use for adolescents that had lower bonds at school (b = 0.10, $p <$ .001). Model 2 displays the results for the respondents in the sample that reported being in the top seventy-fifth percentile for bonds at school. As shown in Model 2, a one standard deviation increase in unstructured socializing results in a 16% increase [100 x ($e^{0.15x1} - 1$)] in soft drug use for adolescents that had stronger bonds at school (b = 0.15, p < .001). Therefore, this suggests that the association between unstructured socializing and soft drug use is stronger for those individuals that reported stronger bonds at school.

When calculating the equality of the coefficient for the effect (Paternoster et al., 1998) of unstructured socializing on soft drug use, the difference in coefficients is statistically significant (z = -2.71, $p < .01$). Therefore, it can be concluded that the effect of unstructured socializing on soft drug use significantly varies by levels of school bond. This supports the idea that bonds at school moderate the association between unstructured socializing and soft drug use, and does not support the seventh hypothesis. The results presented suggest that the effect of unstructured socializing on soft drugs use is amplified

for youth that have stronger bonds at school, a finding that is inconsistent with previous literature (Bernburg & Thorlindsson, 2001; Gage et al., 2005).

Table 5: Negative Binomial Regression of Soft Drug Use on Unstructured Socializing by Bonds at School

Predictors	Model 1: Variety Index for Soft Drug Use (Bottom 25% of Bonds at School)		Model 2: Variety Index for Soft Drug Use (Top 75% of Bonds at School)	
	b	RSE	b	RSE
USWP	0.10***	0.01	0.15***	0.01
Age	0.13***	0.02	0.15***	0.02
Male	-0.15***	0.03	-0.07**	0.02
Black[a]	-0.37***	0.06	-0.27***	0.04
Hispanic[a]	-0.15***	0.04	-0.07*	0.03
Other Race[a]	-0.14**	0.05	-0.17***	0.04
Good Grades	-0.04**	0.01	-0.05***	0.01
Skipped School	0.05***	0.01	0.05***	0.01
Peer Drug Use	0.27***	0.01	0.37***	0.01
Own Attitudes Toward Drugs	0.26***	0.02	0.32***	0.02
Peer Attitudes Toward Drugs	0.02	0.02	0.01	0.01
Low self-control	0.08***	0.02	0.14***	0.01
Neighborhood Disorder	-0.03*	0.01	-0.06***	0.01
Parental Approval of Drug Use	0.02	0.01	0.01	0.01
Bonds with Parents	0.03	0.02	0.03	0.02
Parental Monitoring	-0.08***	0.02	-0.13***	0.02
School Suspension	0.03***	0.01	0.04***	0.01
Family Alcohol/Drug Problems	0.08**	0.03	0.09***	0.03
Variety Index for Ease of Access to Soft Drugs	0.29***	0.02	0.35***	0.02
X^2	3987.19***		5880.76***	
Nagelkerke R^2	0.24		0.27	

Notes. N = 8,669 for Bottom 25%. N = 25,985 for Top 75%. [a] reference group is White; USWP = unstructured socializing with peers; RSE = robust standard error adjusted for clustering within 685 schools; * p < .05 ** p < .01 *** p < .001

b. Hard Drug Use

Another split-sample analysis was conducted to examine the moderating effect of bonds at school on the association between unstructured socializing and hard drug use. Table 6 displays the results for the pair of negative binomial regression models of unstructured socializing predicting the variety index of hard drug use by bonds at school.

Model 1 displays the results for the respondents in the sample that reported being in the bottom twenty-fifth percentile for bonds at school. As shown in Model 1, the effect of unstructured socializing on hard drug use is positive, but failed to reach statistical significance. However, in Model 2, which displays the results for the respondents in the sample that reported being in the top seventy-fifth percentile for bonds at school, a one standard deviation increase in unstructured socializing results in a 7% increase [100 x ($e^{0.07x1} - 1$)] in hard drug use for adolescents that had greater bonds at school (b = 0.07, $p < .05$). Therefore, this suggests that the association between unstructured socializing and hard drug use is stronger for those individuals that reported greater bonds at school.

When calculating the equality of the coefficient for the effect (Paternoster et al., 1998) of unstructured socializing on hard drug use, the difference in coefficients is not statistically significant (z = -0.26, $p > .05$). Therefore, it can be concluded that the effect of unstructured socializing on hard drug use does not significantly vary by levels of school bond. This does not support the idea that bonds at school moderate the association between unstructured socializing and hard drug use and does not support the seventh hypothesis.

Table 6: Negative Binomial Regression of Hard Drug Use on Unstructured Socializing by Bonds at School

Predictors	Model 1: Variety Index for Hard Drug Use (Bottom 25% of Bonds at School)		Model 2: Variety Index for Hard Drug Use (Top 75% of Bonds at School)	
	b	RSE	b	RSE
USWP	0.06	0.04	0.07*	0.03
Age	-0.31***	0.06	-0.39***	0.04
Male	-0.23**	0.08	-0.21**	0.07
Black[a]	-0.03	0.13	0.29**	0.10
Hispanic[a]	-0.06	0.09	0.12	0.09
Other Race[a]	0.14	0.13	0.04	0.11
Good Grades	-0.06	0.03	-0.01	0.04
Skipped School	0.10**	0.03	0.09**	0.03
Peer Drug Use	0.36***	0.04	0.36***	0.03
Own Attitudes Toward Drugs	0.21***	0.05	0.29***	0.04
Peer Attitudes Toward Drugs	0.20***	0.04	0.23***	0.04
Low self-control	0.33***	0.04	0.43***	0.04
Neighborhood Disorder	0.08*	0.04	0.08*	0.03
Parental Approval of Drug Use	0.01	0.03	0.11***	0.03
Bonds with Parents	-0.08	0.04	-0.11*	0.04
Parental Monitoring	-0.19**	0.06	-0.09	0.05
School Suspension	0.03	0.02	0.09***	0.02
Family Alcohol/Drug Problems	0.21*	0.09	0.25**	0.07
Variety Index for Ease of Access to Hard Drugs	0.34***	0.09	0.48***	0.09
X^2	1384.22***		2373.03***	
Nagelkerke R^2	0.17		0.18	

Notes. N = 8,669 for Bottom 25%. N = 25,985 for Top 75%. [a] reference group is White; USWP = unstructured socializing with peers; RSE = robust standard error adjusted for clustering within 685 schools; * p < .05 ** p < .01 *** p < .001

c. Handgun Carrying

To assess the moderating effect of bonds at school on the association between unstructured socializing and handgun carrying, a split-sample analysis was again conducted. Table 7 presents the results for the pair of logistic regressions of unstructured socializing predicting handgun carrying by bonds at school.

Model 1 displays the results for the respondents in the sample that reported being in the bottom twenty-fifth percentile for bonds at school. According to the first model, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of handgun carrying by 16% (OR = 1.16, $p < .001$) for the respondents in the sample that reported having lower levels of bonds at school. Model 2, which displays the results for the respondents in the sample that reported being in the top seventy-fifth percentile for bonds at school, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of handgun carrying by 12% (OR = 1.12, $p < .001$). These results suggest that the effect of unstructured socializing on handgun carrying is higher for youth that reported having lower levels of bonds at school.

When calculating the equality of the coefficient for the effect (Paternoster et al., 1998) of unstructured socializing on handgun carrying, the difference in coefficients is not statistically significant ($z = 0.74$, $p > .05$). Therefore, it can be concluded that the effect of unstructured socializing on handgun carrying does not significantly vary by levels of school bond. This does not support the idea that bonds at school moderate the

association between unstructured socializing and handgun carrying and does not support the eighth hypothesis.

Table 7: Logistic Regression of Handgun Carrying on Unstructured Socializing by Bonds at School

Predictors	Model 1: Handgun Carrying (Bottom 25% of Bonds at School)			Model 2: Handgun Carrying (Top 75% of Bonds at School)		
	b	RSE	OR	b	RSE	OR
USWP	0.15***	0.04	1.16	0.12***	0.03	1.12
Age	-0.11*	0.05	0.90	-0.17***	0.03	0.84
Male	0.94***	0.10	2.56	0.96***	0.07	2.61
Black[a]	-0.38**	0.13	0.69	-0.64***	0.10	0.52
Hispanic[a]	-0.26*	0.11	0.77	-0.23**	0.08	0.80
Other Race[a]	-0.22	0.13	0.80	-0.17	0.10	0.85
Grades	0.02	0.04	1.02	-0.03	0.03	0.97
Skipped School	0.05	0.04	1.05	0.08**	0.03	1.09
Low self-control	0.19***	0.04	1.20	0.18***	0.03	1.20
Neighborhood Disorder	0.19***	0.03	1.21	0.19***	0.03	1.21
Bonds with Parents	0.08	0.05	1.09	0.05	0.03	1.05
Suspension	0.16***	0.02	1.18	0.18***	0.02	1.20
Parental Monitoring for Gun Carrying	-0.32***	0.04	0.72	-0.31***	0.03	0.73
Own Attitudes of Handgun Carrying	0.13***	0.03	1.14	0.17***	0.02	1.19
Ease of Access to Handguns	1.64***	0.10	5.15	1.88***	0.07	6.56
X^2		1051.03***			2236.08***	
Nagelkerke R^2		0.22			0.22	

Notes. N = 8,669 for Bottom 25%. N = 25,985 for Top 75%. [a] reference group is White; USWP = unstructured socializing with peers; RSE = robust standard error adjusted for clustering within 685 schools; * p < .05 ** p < .01 *** p < .001

III. Neighborhood Disorder

a. Soft Drug Use

To assess the moderating effect of neighborhood disorder on the association between unstructured socializing and soft drug use, another split-sample analysis was conducted. Table 8 shows the results for the pair of negative binomial regression models of unstructured socializing predicting the variety index of soft drug use by neighborhood disorder.

Model 1 displays the results for the respondents in the sample that reported living in neighborhoods with the top 25% of scores for neighborhood disorder. As shown in Model 1, a one standard deviation increase in unstructured socializing results in a 13% increase [100 x ($e^{0.12x1} - 1$)] in soft drug use for adolescents that live in neighborhoods with greater neighborhood disorder (b = 0.12, $p < .001$). Model 2 displays the results for the respondents in the sample that reported living in neighborhoods with the bottom 75% of scores for neighborhood disorder. As shown in Model 2, a one standard deviation increase in unstructured socializing results in a 16% increase [100 x ($e^{0.15x1} - 1$)] in soft drug use for adolescents that live in neighborhoods with lower neighborhood disorder (b = 0.15, $p < .001$). Therefore, this suggests that the association between unstructured socializing and soft drug use is stronger for those individuals that reported living in neighborhoods with less disorder.

When calculating the equality of the coefficient for the effect (Paternoster et al., 1998) of unstructured socializing on soft drug use, the difference in coefficients is not statistically significant (z = -1.95, $p > .05$). Therefore, it can be concluded that the effect of unstructured socializing on soft drug use does not significantly vary by levels of

neighborhood disorder. This does not support the notion that neighborhood disorder moderates the association between unstructured socializing and soft drug use and does not support the ninth hypothesis.

Table 8: Negative Binomial Regression of Soft Drug Use on Unstructured Socializing by Neighborhood Disorder

Predictors	Model 1: Variety Index for Soft Drug Use (Top 25% of Neighborhood Disorder)		Model 2: Variety Index for Soft Drug Use (Bottom 75% of Neighborhood Disorder)	
	b	RSE	b	RSE
USWP	0.12***	0.01	0.15***	0.01
Age	0.09***	0.02	0.18***	0.02
Male	-0.09**	0.03	-0.10***	0.02
Black[a]	-0.27***	0.05	-0.34***	0.04
Hispanic[a]	-0.08*	0.04	-0.12***	0.03
Other Race[a]	-0.08	0.05	-0.21***	0.04
Good Grades	-0.06***	0.01	-0.04**	0.01
Skipped School	0.06***	0.01	0.04***	0.01
Peer Drug Use	0.27***	0.01	0.37***	0.01
Own Attitudes Toward Drugs	0.27***	0.02	0.31***	0.02
Peer Attitudes Toward Drugs	0.04*	0.02	-0.01	0.02
Low self-control	0.06**	0.02	0.14***	0.01
Parental Approval of Drug Use	0.01	0.01	0.02	0.01
Bonds at School	0.06	0.04	-0.03	0.03
Bonds with Parents	0.03	0.02	0.03*	0.01
Parental Monitoring	-0.09***	0.02	-0.13***	0.02
School Suspension	0.03***	0.01	0.04**	0.01
Family Alcohol/Drug Problems	0.06*	0.03	0.10***	0.02
Variety Index for Ease of Access to Soft Drugs	0.30***	0.02	0.33***	0.02
X^2	4257.73***		6160.99***	
Nagelkerke R^2	0.23		0.27	

Notes. N = 8,652 for Top 25%. N = 26,002 for Bottom 75%. [a] reference group is White; USWP = unstructured socializing with peers; RSE = robust standard error adjusted for clustering within 685 schools; * p < .05 ** p < .01 *** p < .001

b. Hard Drug Use

To examine the moderating effect of neighborhood disorder on the association between unstructured socializing and hard drug use, a split-sample analysis was utilized. Table 9 presents the results for the series of negative binomial regression models of unstructured socializing predicting the variety index of hard drug use by neighborhood disorder.

Model 1 displays the results for the respondents in the sample that reported living in neighborhoods with the top 25% of neighborhood disorder. As shown in Model 1, a one standard deviation increase in unstructured socializing results in a 9% increase [100 x ($e^{0.09x1} - 1$)] in hard drug use for adolescents that live in neighborhoods with greater neighborhood disorder (b = 0.09, $p < .05$). Model 2 displays the results for the respondents in the sample that reported living in neighborhoods with the bottom 75% of neighborhood disorder. As shown in Model 2, the coefficient for unstructured socializing with peers did not reach statistical significance, but suggests a positive, yet weaker association, between unstructured socializing and hard drug use for adolescents that live in neighborhoods with less neighborhood disorder. Therefore, this suggests that the association between unstructured socializing and hard drug use is stronger for those individuals that reported living in neighborhoods with greater neighborhood disorder.

When calculating the equality of the coefficient for the effect (Paternoster et al., 1998) of unstructured socializing on hard drug use, the difference in coefficients is not statistically significant (z = 0.61, $p > .05$). Therefore, it can be concluded that the effect of unstructured socializing on hard drug use does not significantly vary by levels of neighborhood disorder. This does not support the notion that neighborhood disorder

moderates the association between unstructured socializing and hard drug use and does not support the ninth hypothesis.

Table 9: Negative Binomial Regression of Hard Drug Use on Unstructured Socializing by Neighborhood Disorder

Predictors	Model 1: Variety Index for Hard Drug Use (Top 25% of Neighborhood Disorder)		Model 2: Variety Index for Hard Drug Use (Bottom 75% of Neighborhood Disorder)	
	b	RSE	b	RSE
USWP	0.09*	0.04	0.06	0.03
Age	-0.38***	0.05	-0.36***	0.05
Male	-0.14	0.07	-0.27***	0.07
Black[a]	0.21	0.13	0.16	0.11
Hispanic[a]	0.00	0.10	0.09	0.09
Other Race[a]	0.03	0.13	0.16	0.11
Good Grades	-0.03	0.04	-0.05	0.03
Skipped School	0.06*	0.03	0.12***	0.03
Peer Drug Use	0.32***	0.04	0.39***	0.04
Own Attitudes Toward Drugs	0.23***	0.05	0.26***	0.04
Peer Attitudes Toward Drugs	0.21***	0.05	0.22***	0.04
Low self-control	0.31***	0.05	0.46***	0.04
Parental Approval of Drug Use	0.09***	0.02	0.06*	0.03
Bonds at School	-0.22	0.13	-0.17	0.11
Bonds with Parents	-0.13*	0.05	-0.09*	0.04
Parental Monitoring	-0.06	0.06	-0.19***	0.05
School Suspension	0.09***	0.02	0.02	0.02
Family Alcohol/Drug Problems	0.25**	0.09	0.26**	0.07
Variety Index for Ease of Access to Hard Drugs	0.31***	0.08	0.55***	0.09
X^2	1342.33***		2407.46***	
Nagelkerke R^2	0.16		0.18	

Notes. N = 8,652 for Top 25%. N = 26,002 for Bottom 75%. [a] reference group is White; USWP = unstructured socializing with peers; RSE = robust standard error adjusted for clustering within 685 schools; * p < .05 ** p < .01 *** p < .001

c. Handgun Carrying

To examine the moderating effect of neighborhood disorder on the association between unstructured socializing and handgun carrying, a split-sample analysis was again conducted. Table 10 presents the results for the pair of logistic regressions of unstructured socializing predicting handgun carrying by neighborhood disorder.

Model 1 displays the results for the respondents in the sample that reported living in neighborhoods with the top 25% of neighborhood disorder, while Model 2 presents the results for the respondents in the sample that reported living in neighborhoods with the bottom 75% of neighborhood disorder. According to the first model, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of handgun carrying by 21% (OR = 1.21, $p < .001$) for adolescents that live in neighborhoods with greater neighborhood disorder. However, as shown in Model 2, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of handgun carrying by 9% (OR = 1.09, $p < .01$) for adolescents that live in neighborhoods with reduced levels of neighborhood disorder. This suggests that the effect of unstructured socializing on handgun carrying is stronger for youth who reside in neighborhoods with greater levels of neighborhood disorder.

Further, when calculating the equality of the coefficient for the effect of unstructured socializing on handgun carrying, the difference in coefficients ($z = 2.10$, $p < .05$) is statistically significant. Thus, it can be concluded that the effect of unstructured socializing on handgun carrying significantly varies by neighborhood disorder. Therefore, this suggests that neighborhood disorder moderates the association between

unstructured socializing and handgun carrying. These results support hypothesis ten, which assumed that the effect of unstructured socializing on handgun carrying would be greater for individuals that live in neighborhoods with greater neighborhood disorder.

Table 10: Logistic Regression of Handgun Carrying on Unstructured Socializing by Neighborhood Disorder

Predictors	Model 1: Handgun Carrying (Top 25% of Neighborhood Disorder)			Model 2: Handgun Carrying (Bottom 75% of Neighborhood Disorder)		
	b	RSE	OR	b	RSE	OR
USWP	0.18***	0.04	1.21	0.09**	0.03	1.09
Age	-0.15**	0.04	0.86	-0.15***	0.03	0.86
Male	0.78***	0.09	2.19	1.05***	0.07	2.86
Black[a]	-0.40**	0.12	0.67	-0.61***	0.11	0.54
Hispanic[a]	-0.20	0.11	0.82	-0.22**	0.08	0.80
Other Race[a]	-0.10	0.13	0.91	-0.23*	0.10	0.79
Grades	-0.5	0.04	0.96	0.00	0.03	1.00
Skipped School	0.12***	0.03	1.12	0.03	0.03	1.03
Low self-control	0.17***	0.05	1.19	0.21***	0.03	1.23
Bonds at School	-0.08	0.12	0.92	-0.23**	0.09	0.80
Bonds with Parents	0.04	0.05	1.05	0.07*	0.03	1.07
Suspension	0.21***	0.03	1.23	0.14***	0.02	1.15
Parental Monitoring for Gun Carrying	-0.45***	0.04	0.64	-0.25***	0.03	0.78
Own Attitudes of Handgun Carrying	0.16***	0.03	1.17	0.15***	0.02	1.16
Ease of Access to Handguns	1.64***	0.08	5.14	1.94***	0.07	6.97
X^2		1157.23***			2048.47***	
Nagelkerke R^2		0.24			0.19	

Notes. N = 8,652 for Top 25%. N = 26,002 for Bottom 75%. [a] reference group is White; USWP = unstructured socializing with peers; RSE = robust standard error adjusted for clustering within 685 schools; * p < .05 ** p < .01 *** p < .001

IV. Supplemental Analyses

a. Bonds with Parents

To assess if bonds with parents moderates the association between unstructured socializing and each of the individual soft drugs, a split-sample analysis was again conducted for each individual substance. Table 11 presents the results for the series of logistic regressions of unstructured socializing predicting alcohol and cigarette use by levels of bonds with parents.

Model 1 and Model 2 display the results for alcohol consumption. Model 1 displays the results for respondents in the sample that reported being in the bottom twenty-fifth percentile for bonds with parents. According to Model 1, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of alcohol consumption by 20% (OR = 1.20, $p < .001$) for youth that reported being in the bottom twenty-fifth percentile for bonds with parents. As shown in Model 2, which presents the results for the respondents in the sample that reported being in the top seventy-fifth percentile for bonds with parents, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of alcohol consumption by 24% (OR = 1.24, $p < .001$). Therefore, this suggests that the association between unstructured socializing and alcohol consumption is stronger for youth that have greater levels of parental bonds. However, this is contradictory to hypothesis five, which suggested that the effect would be greater for youth that reported having lower levels of parental bonds.

When calculating the equality of the coefficient for the effect of unstructured socializing on alcohol consumption, the difference in coefficients is not statistically significant ($z = -1.06$, $p > .05$). Therefore, it can be concluded that the effect of unstructured socializing on alcohol consumption does not vary statistically by levels of parental bond. Thus, this does not support the idea that lower levels of parental bonds will amplify the effect of unstructured socializing with peers on alcohol use.

Model 3 and Model 4 display the results for cigarette use. Model 3 displays the results for the respondents in the sample that reported being in the bottom twenty-fifth percentile for bonds with parents, and Model 4 show the results for respondents that reported being in the top seventy-fifth percentile for bonds with parents. According to Model 3 and Model 4, the effect of unstructured socializing on cigarette use for both adolescents with greater and lower levels of parental bonds did not reach statistical significance.

When calculating the equality of the coefficient for the effect of unstructured socializing on cigarette usage, the difference in coefficients is not statistically significant ($z = 0.27$, $p > 05$). Therefore, it can be concluded that the effect of unstructured socializing on cigarette use does not significantly vary by bonds with parents. Consequently, this does not support the idea that having lower levels of parental bonds would amplify the association between unstructured socializing and cigarette use.

Table 12 presents the results for the series of logistic regressions of unstructured socializing predicting e-cigarette and marijuana use by level of bonds with parents. Model 5 and Model 6 display the results for e-cigarette use. Model 5 displays the results for the respondents in the sample that reported being in the bottom twenty-fifth percentile

for bonds with parents, while Model 6 shows the results for the respondents in the sample that reported being in the top seventy-fifth percentile for bonds with parents. According to Model 5, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of e-cigarette use by 31% (OR = 1.31, $p < .001$) for youth that reported being in the bottom twenty-fifth percentile for bonds with parents. As shown in Model 6, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of e-cigarette use by 43% (OR = 1.43, $p < .001$) for youth that reported being in the top seventy-fifth percentile for bonds with parents. Therefore, this suggests that the association between unstructured socializing and e-cigarette use may be stronger for youth that have greater bonds with parents.

When calculating the equality of the coefficient for the effect of unstructured socializing on e-cigarette use, the difference in coefficients is statistically significant ($z = -2.51$, $p < .05$). Therefore, it can be concluded that the effect of unstructured socializing on e-cigarette use significantly varies by bonds with parents. Thus, the argument that bonds with parents moderates the association between unstructured socializing and e-cigarette use is supported. However, the results shown here are contradictory to hypothesis five, which predicted that the effect would be stronger for those adolescents with lower levels of parental bonds.

Model 7 and Model 8 display the results for marijuana use. Model 7 displays the results for adolescents that reported being in bottom twenty-fifth percentile for bonds with parents. According to Model 7, while controlling for the other independent variables

included in the model, a one standard deviation increase in unstructured socializing increases the odds of marijuana usage by 26% (OR = 1.26, $p < .001$) for adolescents that reported having lower levels of bonds with parents. As shown in Model 8, which displays the results for the adolescents that reported being in the top seventy-fifth percentile for bonds with parents, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of marijuana usage by 34% (OR = 1.34, $p < .001$). Therefore, this suggests that the association between unstructured socializing and marijuana usage may be stronger for adolescents that reported having greater bonds with parents.

However, when calculating the equality of the coefficient for the effect of unstructured socializing marijuana use, the difference in coefficients is not statistically significant ($z = -0.41$, $p > .05$). Thus, it can be concluded that the effect of unstructured socializing on marijuana use does not significantly vary by bonds with parents. Overall, this does not support the idea that bonds with parents moderates the association between unstructured socializing and marijuana use.

Table 11: Logistic Regressions of Individual Soft Drug Use on Unstructured Socializing by Bonds with Parents

	Model 1: Alcohol (Bottom 25% of Bonds with Parents)			Model 2: Alcohol (Top 75% of Bonds with Parents)			Model 3: Cigarettes (Bottom 25% of Bonds with Parents)			Model 4: Cigarettes (Top 75% of Bonds with Parents)		
	b	RSE	OR	*b*	RSE	OR	*b*	RSE	OR	*b*	RSE	OR
USWP	0.18***	0.03	1.20	0.22***	0.02	1.24	0.06	0.05	1.06	0.04	0.05	1.04

Notes. N = 8,027 for Top 25%. N = 26,627 for Bottom 75%. All models account for age, sex, race, grades, skipping school, peer substance use, attitudes favorable of substance use, peer approval of substance use, low self-control, parental approval of substance use, neighborhood disorder, parental monitoring, suspension, bonds at school, ease of access, and family drug problems; [a] reference group is White; *b* = unstandardized logistic regression coefficient; RSE = robust standard error adjusted for clustering within 685 schools; OR = odds ratio; * p < .05 ** p < .01 *** p < .001

Table 12: Logistic Regressions of Individual Soft Drug Use on Unstructured Socializing by Bonds with Parents Part 2

	Model 5: E-Cigarettes (Bottom 25% of Bonds with Parents)			Model 6: E-Cigarettes (Top 75% of Bonds with Parents)			Model 7: Marijuana (Bottom 25% of Bonds with Parents)			Model 8: Marijuana (Top 75% of Bonds with Parents)		
	b	RSE	OR	*b*	RSE	OR	*b*	RSE	OR	*b*	RSE	OR
USWP	0.27***	0.03	1.31	0.36***	0.02	1.43	0.23***	0.03	1.26	0.29***	0.03	1.34

Notes. N = 8,027 for Bottom 25%. N = 26,627 for Top 75%. All models account for age, sex, race, grades, skipping school, peer substance use, attitudes favorable of substance use, peer approval of substance use, low self-control, parental approval of substance use, neighborhood disorder, parental monitoring, suspension, bonds at school, ease of access, and family drug problems; [a] reference group is White; *b* = unstandardized logistic regression coefficient; RSE = robust standard error adjusted for clustering within 685 schools; OR = odds ratio; * p < .05 ** p < .01 *** p < .001

b. Bonds at School

To assess if bonds at school moderates the association between unstructured socializing and the use of individual soft drugs, a split-sample analysis was again conducted. Table 13 presents the results for the series of logistic regressions of unstructured socializing predicting alcohol and cigarette use by bonds at school.

Model 1 and Model 2 display the results for alcohol consumption. Model 1 displays the results for respondents in the sample that reported being in the bottom twenty-fifth percentile for bonds at school. According to Model 1, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of alcohol consumption by 19% (OR = 1.19, $p < .001$) for youth that reported having lower levels of bonds at school. As shown in Model 2, which presents the results for the respondents in the sample that reported being in the top seventy-fifth percentile for bonds at school, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of alcohol consumption by 25% (OR = 1.25, $p < .001$) for youth that reported having greater levels of bonds at school. Therefore, this suggests that the association between unstructured socializing and alcohol consumption is stronger for youth that have greater levels of school bonds. However, this is contradictory to hypothesis seven, which suggested that the effect would be greater for youth that reported having lower levels of school bonds.

When calculating the equality of the coefficient for the effect of unstructured socializing on alcohol consumption, the difference in coefficients is not statistically significant ($z = -1.47$, $p > .05$). Therefore, it can be concluded that the effect of

unstructured socializing on alcohol consumption does not vary statistically by levels of school bond. Thus, this does not support the idea that lower levels of school bonds will amplify the effect of unstructured socializing with peers on alcohol use.

Model 3 and Model 4 display the results for cigarette use. Model 3 displays the results for the respondents in the sample that reported being in the bottom twenty-fifth percentile for bonds at school, and Model 4 show the results for respondents that reported being in the top seventy-fifth percentile for bonds at school. According to Model 3 and Model 4, the effect of unstructured socializing on cigarette use for both adolescents with greater and lower levels of school bonds did not reach statistical significance.

When calculating the equality of the coefficient for the effect of unstructured socializing on cigarette use, the difference in coefficients is not statistically significant ($z = -0.94$, $p > .05$). Therefore, it can be concluded that the effect of unstructured socializing on cigarette use does not significantly vary by bonds at school. Consequently, this does not support the idea that having lower levels of school bonds would amplify the association between unstructured socializing and cigarette use.

Table 14 presents the results for the series of logistic regressions of unstructured socializing predicting e-cigarette and marijuana use by bonds at school. Model 5 and Model 6 display the results for e-cigarette use. Model 5 displays the results for the respondents in the sample that reported being in the bottom twenty-fifth percentile for bonds at school, while Model 6 show the results for the respondents in the sample that reported being in the top seventy-fifth percentile for bonds at school. According to Model 5, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of e-cigarette

use by 33% (OR = 1.33, $p < .001$) for youth that reported being in the bottom twenty-fifth percentile for bonds at school. As shown in Model 6, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of e-cigarette use by 42% (OR = 1.42, $p < .001$) for youth that reported being in the top seventy-fifth percentile for bonds at school. Therefore, this suggests that the association between unstructured socializing and e-cigarette use may be stronger for youth that have greater bonds at school.

When calculating the equality of the coefficient for the effect of unstructured socializing on e-cigarette use, the difference in coefficients is not statistically significant ($z = -1.84$, $p > .05$). Therefore, it can be concluded that the effect of unstructured socializing on e-cigarette use does not significantly vary by bonds at school. Thus, the argument that bonds at school moderates the association between unstructured socializing and e-cigarette use is not supported.

Model 7 and Model 8 display the results for marijuana use. Model 7 displays the results for adolescents that reported being in bottom twenty-fifth percentile for bonds at school. According to Model 7, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of marijuana usage by 32% (OR = 1.32, $p < .001$) for adolescents that reported being in the bottom twenty-fifth percentile for bonds at school. As shown in Model 8, which displays the results for the adolescents that reported being in the top seventy-fifth percentile for bonds at school, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of marijuana usage by 30% (OR = 1.30, $p < .001$).

Therefore, this suggests that the association between unstructured socializing and marijuana use may be stronger for adolescents that reported having lower bonds at school, which supports hypothesis seven.

However, when calculating the equality of the coefficient for the effect of unstructured socializing marijuana use, the difference in coefficients is not statistically significant ($z = 0.48$, $p > .05$). Thus, it can be concluded that the effect of unstructured socializing on marijuana use does not significantly vary by bonds at school. Overall, this does not support the idea that bonds at school moderates the association between unstructured socializing and marijuana use.

Table 13: Logistic Regressions of Individual Soft Drug Use on Unstructured Socializing by Bonds at School

	Model 1: Alcohol (Bottom 25% of Bonds at School)			Model 2: Alcohol (Top 75% of Bonds at School)			Model 3: Cigarettes (Bottom 25% of Bonds at School)			Model 4: Cigarettes (Top 75% of Bonds at School)		
	b	RSE	OR	*b*	RSE	OR	*b*	RSE	OR	*b*	RSE	OR
USWP	0.17***	0.03	1.19	0.22***	0.02	1.25	0.01	0.05	1.01	0.08	0.05	1.08

Notes. N = 8,669 for Top 25%. N = 25,985 for Bottom 75%. All models account for age, sex, race, grades, skipping school, peer substance use, attitudes favorable of substance use, peer approval of substance use, low self-control, parental approval of substance use, neighborhood disorder, parental monitoring, suspension, bonds with parents, ease of access, and family drug problems; [a] reference group is White; *b* = unstandardized logistic regression coefficient; RSE = robust standard error adjusted for clustering within 685 schools; OR = odds ratio; * p < .05 ** p < .01 *** p < .001

Table 14: Logistic Regressions of Individual Soft Drug Use on Unstructured Socializing by Bonds at School Part 2

	Model 5: E-Cigarettes (Bottom 25% of Bonds at School)			Model 6: E-Cigarettes (Top 75% of Bonds at School)			Model 7: Marijuana (Bottom 25% of Bonds at School)			Model 8: Marijuana (Top 75% of Bonds at School)		
	b	RSE	OR	*b*	RSE	OR	*b*	RSE	OR	*b*	RSE	OR
USWP	0.28***	0.03	1.33	0.35***	0.02	1.42	0.28***	0.03	1.32	0.26***	0.03	1.30

Notes. N = 8,669 for Bottom 25%. N = 25,985 for Top 75%. All models account for age, sex, race, grades, skipping school, peer substance use, attitudes favorable of substance use, peer approval of substance use, low self-control, parental approval of substance use, neighborhood disorder, parental monitoring, suspension, bonds with parents, ease of access ease of access, and family drug problems; [a] reference group is White; *b* = unstandardized logistic regression coefficient; RSE = robust standard error adjusted for clustering within 685 schools; OR = odds ratio; * p < .05 ** p < .01 *** p < .001

c. Neighborhood Disorder

A split-sample analysis was again conducted to examine the moderating effect of neighborhood disorder on the association between unstructured socializing and each of the individual soft drugs. Table 15 presents the results for the series of logistic regressions of unstructured socializing predicting alcohol and cigarette use by neighborhood disorder.

Model 1 and Model 2 display the results for alcohol consumption. Model 1 displays the results for the respondents in the sample that reported living in neighborhoods with the top 25% of neighborhood disorder. According to Model 1, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of alcohol consumption by 18% (OR = 1.18, $p < .001$) for youth that live in neighborhoods with greater neighborhood disorder. As shown in Model 2, which presents the results for the respondents in the sample that reported living in neighborhoods with the bottom 75% of neighborhood disorder, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of alcohol consumption by 25% (OR = 1.25, $p < .001$) for youth that live in neighborhoods with lower neighborhood disorder. Therefore, this suggests that the association between unstructured socializing and alcohol consumption is stronger for youth that live in neighborhoods with lower neighborhood disorder. This is contradictory to hypothesis nine, which suggested that the effect would be greater for youth that live in neighborhoods with greater neighborhood disorder.

When calculating the equality of the coefficient for the effect of unstructured socializing on alcohol consumption, the difference in coefficients is not statistically significant ($z = -1.46$, $p > .05$). Therefore, it can be concluded that the effect of unstructured socializing on alcohol consumption does not vary statistically by levels of neighborhood disorder. Thus, this does not support the idea that greater levels of neighborhood disorder will amplify the effect of unstructured socializing with peers on substance use.

Model 3 and Model 4 display the results for cigarette use. Model 3 displays the results for the respondents in the sample that reported living in neighborhoods with the top 25% of neighborhood disorder, and Model 4 shows the results for the respondents in the sample that reported living in neighborhoods with the bottom 75% of neighborhood disorder. According to Model 3, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of cigarette use by 10% (OR = 1.10, $p < .05$) for adolescents that reside in neighborhoods with greater neighborhood disorder. As shown in Model 4, the effect for adolescents that reside in neighborhoods with lower neighborhood disorder is non-significant. Therefore, this suggests that the association between unstructured socializing and cigarette use may be stronger for adolescents that reside in neighborhoods with greater neighborhood disorder.

When calculating the equality of the coefficient for the effect of unstructured socializing on cigarette use, the difference in coefficients is not statistically significant. Therefore, it can be concluded that the effect of unstructured socializing on cigarette use does not significantly vary by neighborhood disorder ($z = 1.44$, $p > .05$). Consequently,

this does not support the idea that residing in neighborhoods plagued with disorder amplifies the association between unstructured socializing and cigarette use.

Table 16 presents the results for the series of logistic regressions of unstructured socializing predicting e-cigarette and marijuana use by neighborhood disorder. Model 5 and Model 6 display the results for e-cigarette use. Model 5 displays the results for the respondents in the sample that reported living in neighborhoods with the top 25% of neighborhood disorder, while Model 6 show the results for the respondents in the sample that reported living in neighborhoods with the bottom 75% of neighborhood disorder. According to Model 5, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of e-cigarette use by 37% (OR = 1.37, $p < .001$) for youth that live in neighborhoods with greater neighborhood disorder. As shown in Model 6, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of e-cigarette use by 39% (OR = 1.39, $p < .001$) for youth that live in neighborhoods with lower neighborhood disorder. Therefore, this suggests that the association between unstructured socializing and e-cigarette use may be stronger for youth that live in neighborhoods with less neighborhood disorder.

However, when calculating the equality of the coefficient for the effect of unstructured socializing on e-cigarette use, the difference in coefficients is not statistically significant ($z = -0.45$, $p > .05$). Therefore, it can be concluded that the effect of unstructured socializing on e-cigarette use does not significantly vary by neighborhood disorder. Thus, the argument that neighborhood disorder moderates the association between unstructured socializing and e-cigarette use is not supported.

Model 7 and Model 8 display the results for marijuana use. Model 7 displays the results for adolescents that reside in neighborhoods with greater neighborhood disorder. According to Model 7, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of marijuana use by 31% (OR = 1.31, $p < .001$) for adolescents that reside in neighborhoods with greater neighborhood disorder. As shown in Model 8, which displays the results for the adolescents that reside in neighborhoods with less neighborhood disorder, while controlling for the other independent variables included in the model, a one standard deviation increase in unstructured socializing increases the odds of marijuana usage by 30% (OR = 1.30, $p < .001$) for adolescents that reside in neighborhoods with less neighborhood disorder. Therefore, this suggests that the association between unstructured socializing and marijuana usage may be stronger for adolescents that reside in neighborhoods with greater neighborhood disorder.

However, when calculating the equality of the coefficient for the effect of unstructured socializing marijuana use, it can be seen that the difference in coefficients is not statistically significant. Thus, it can be concluded that the effect of unstructured socializing on marijuana use does not significantly vary by neighborhood disorder ($z = 0.16$, $p > .05$). Overall, this does not support the idea that neighborhood disorder moderates the association between unstructured socializing and marijuana use.

Table 15: Logistic Regressions of Individual Soft Drug Use on Unstructured Socializing by Neighborhood Disorder

	Model 1: Alcohol (Top 25% of Neighborhood Disorder)			Model 2: Alcohol (Bottom 75% of Neighborhood Disorder)			Model 3: Cigarettes (Top 25% of Neighborhood Disorder)			Model 4: Cigarettes (Bottom 75% of Neighborhood Disorder)		
	b	RSE	OR	*b*	RSE	OR	*b*	RSE	OR	*b*	RSE	OR
USWP	0.17***	0.03	1.18	0.22***	0.02	1.25	0.10*	0.05	1.10	0.00	0.04	1.00

Notes. N = 8,652 for Top 25%. N = 26,002 for Bottom 75%. All models account for age, sex, race, grades, skipping school, peer substance use, attitudes favorable of substance use, peer approval of substance use, low self-control, parental approval of substance use, parental monitoring, suspension, bonds at school, bonds with parents, ease of access, and family drug problems; [a] reference group is White; *b* = unstandardized logistic regression coefficient; RSE = robust standard error adjusted for clustering within 685 schools; OR = odds ratio; * p < .05 ** p < .01 *** p < .001

Table 16: Logistic Regressions of Individual Soft Drug Use on Unstructured Socializing by Neighborhood Disorder Part 2

	Model 5: E-Cigarettes (Top 25% of Neighborhood Disorder)			Model 6: E-Cigarettes (Bottom 75% of Neighborhood Disorder)			Model 7: Marijuana (Top 25% of Neighborhood Disorder)			Model 8: Marijuana (Bottom 75% of Neighborhood Disorder)		
	b	RSE	OR	*b*	RSE	OR	*b*	RSE	OR	*b*	RSE	OR
USWP	0.31***	0.03	1.37	0.33***	0.02	1.39	0.27***	0.03	1.31	0.26***	0.03	1.30

Notes. N = 8,652 for Top 25%. N = 26,002 for Bottom 75%. All models account for age, sex, race, grades, skipping school, peer substance use, attitudes favorable of substance use, peer approval of substance use, low self-control, parental approval of substance use, parental monitoring, suspension, bonds at school, bonds with parents, ease of access, and family drug problems; [a] reference group is White; *b* = unstandardized logistic regression coefficient; RSE = robust standard error adjusted for clustering within 685 schools; OR = odds ratio; * p < .05 ** p < .01 *** p < .001

CHAPTER 8

VIII. DISCUSSION, IMPLICATIONS, LIMITATIONS, AND SUGGESTIONS FOR FUTURE RESEARCH

This dissertation aimed to provide an important addition to previous research on unstructured socializing with peers, adolescent substance use, and handgun carrying. Investigating the mediating effects of ease of access and the moderating effects of gender, bonds with parents, bonds at school, and neighborhood disorder on the unstructured socializing – substance use and unstructured socializing – handgun carrying relationships revealed noteworthy results and implications.

This chapter will summarize the results from Chapters five, six, and seven, discuss the policy and theory-relevant implications of this research, review the limitations of this research, and suggest avenues for future research on unstructured socializing with peers, substance use, and handgun carrying among adolescents.

8.1 The Mediating Role of Ease of Access

In Chapter five, Osgood et al.'s (1996) routine activity theory was used to examine the complex relationships between unstructured socializing, substance use, and gun carrying. Specifically, this chapter sought to examine how the ease of access to substances and handguns mediates the association between (1) unstructured socializing with peers and drug use, and (2) unstructured socializing with peers and handgun carrying. The results from the chapter are summarized below.

I. Results from Chapter Five

Chapter five tested the first and second hypotheses. The first hypothesis tests the effect of unstructured socializing with peers (IV) on substance use (DV) while being mediated by the easiness of access to different substances (MeV). It is anticipated that unstructured socializing with peers will have a positive effect on easiness of access to different substances and easiness of access to different substances will have a positive effect on substance use. The second hypothesis tests the effect of unstructured socializing with peers (IV) on handgun carrying (DV) while being mediated by the easiness of access to handguns (MeV). It is anticipated that unstructured socializing with peers will have a positive effect on easiness of access to handguns and easiness of access to handguns will have a positive effect on handgun carrying.

Chapter 5 revealed that unstructured socializing has a positive effect on the use of soft drugs, unstructured socializing has a positive effect on the ease of access to soft drugs, and the ease of access to soft drugs has a positive association with soft drug use. The first main finding in Chapter 5 is that the effect of unstructured socializing with peers on soft drug use is partially mediated by ease of access. Approximately 18% mediation is observed.

Additionally, it was determined that unstructured socializing has a positive effect on hard drug use, unstructured socializing has a positive effect on the ease of access to hard drugs, and the ease of access to hard drugs has a positive association with hard drug use. The second main finding from Chapter 5 is that the effect of unstructured socializing with peers on hard drug use is partially mediated by ease of access, with roughly 25% mediation observed. Thus, these first two findings are partially consistent with the first

hypothesis as a higher percent of mediation would need to be found to fully support the hypothesis.

The third main finding in Chapter 5 found evidence to support the second hypothesis. It was observed that unstructured socializing has a positive effect on handgun carrying, unstructured socializing has a positive effect on the ease of access to handguns, and the ease of access to handguns has a positive effect on handgun carrying. Furthermore, it was found that the effect of unstructured socializing with peers on handgun carrying is partially mediated by ease of access to handguns. There was 28% mediation observed

Moreover, when investigating the effect of ease of access on the relationship between unstructured socializing and individual soft substances, it can be seen that the effect of unstructured socializing with peers on alcohol consumption is partially mediated by ease of access to alcohol; approximately 13% mediation is observed. Second, it can be seen that the effect of unstructured socializing with peers on the use of cigarettes is partially mediated by ease of access to cigarettes; approximately 38% mediation is observed. Third, the findings suggest that the effect of unstructured socializing with peers on the use of e-cigarettes is minimally mediated by ease of access to e-cigarettes; only 3% mediation is observed. Fourth, the effect of unstructured socializing with peers on smoking marijuana is partially mediated by ease of access to marijuana; approximately 16% mediation is observed.

However, when investigating the effect of ease of access on the relationship between unstructured socializing and individual hard substances only a few firm conclusions can be made. The ease of access to hard drugs mediates the relationship

between unstructured socializing and LSD use by 31%. Second, the ease of access to hard drugs mediates the relationship between unstructured socializing and cocaine and crack use by 20%. Last, the ease of access to hard drugs mediates the relationship between unstructured socializing and steroid use by 6%. For several of the other hard drugs there was no evidence of mediation and/or no association between USWP and the particular hard drug to begin with, which resulted in limited conclusions on hard drug use. This may be due to the fact that so few respondents reported hard drug usage. The following section will discuss the policy and theory-relevant implications of these results from Chapter 5.

II. Implications

These findings reveal several important theoretical and policy-relevant implications. First, this study supports prior research that the ease of access to various drugs and handguns increases the likelihood of drug use and handgun carrying (Alter et al., 2006; Barret, 1999; Doubeni et al., 2008; Keyes et al., 2011; Komro et al., 2007; Kuntsche and Jordan, 2006; Lowry et al., 1999; Swaim, 2003; Williams et al., 2002). Additionally, this research may support the idea that unstructured settings can expose adolescents to delinquent peers (Hoeben and Weerman, 2016), which in turn, establishes easier access to substances and handguns, and creates the risk for substance use and carrying (Fletcher et al. 2009).

Furthermore, consistent with previous research, this study reveals that a positive association exists between access and usage and carrying (Alter et al., 2006; Keyes et al., 2011; Williams et al., 2002). Therefore, from a policy standpoint, it is of great importance to limit and restrict access to drugs and handguns in order to reduce drug

usage and handgun carrying. Additionally, since access may stem from within the home (Ertas, 2006; Forrester et al., 2007; Komro et al., 2007; Nichols et al., 2006; Wagenaar et al., 1996; O'Hearst et al., 2007), it is also crucial for parents to examine the availability of substances and guns at home and how this can increase the rate of use and carrying among adolescents. This will require parents to invest in proper storage devices for drugs and firearms within the home, which usually include locked storage cases. Furthermore, other avenues of exposure to drugs and handguns are through opportunities with friends, which has been considered a risk factor strongly supported in within this dissertation and previous literature (Ragan, Osgood, and Feinberg, 2014; Osgood et al., 2013). This will require parents to limit their children's time in unstructured settings with peers and to increase parental supervision, as previous research has determined that higher levels of parental monitoring results in intervention and prevention of substance use and handgun carrying (Guo, Reeder, McGee, and Darling, 2011).

Second, this research establishes that ease of access partially mediates the unstructured socializing – substance use and unstructured socializing – handgun carrying relationships. This is a pathway that, to the authors' knowledge, has not been investigated before. While some attention has been directed at investigating potential mediators of the relationship between unstructured socializing with peers and general delinquency (Barnes et al., 2007; Flannery et al., 1999; Wong, 2005), less attention has specifically focused on substance use and handgun carrying as outcomes of unstructured socializing with peers. Thus, this study highlights the importance of the examination of relevant theoretical mediating variables that have not been sufficiently examined in previous research

pertaining to the mechanisms through which unstructured socializing with peers increases the risk of antisocial behaviors.

Third, this research provides theoretical support for Osgood and colleagues (1996) in the way that unstructured socializing is positively associated with various delinquent behaviors, including substance use and handgun carrying. Additionally, these results extend the theory and suggest that unstructured socializing not only poses a risk for deviant behavior, but it also presents adolescents with the access to substance use and handguns, which then presents the opportunity for them to engage in delinquent behavior. Fifth, these findings reveal patterns that can inform innovative intervention programming strategies that are implemented at the school-level as well as federally.

To date, many states have set the minimum legal age to purchase a firearm at 18-years-old. Since young adults are known to engage in more gun-related behaviors than older adults, raising the restrictions to purchase guns to the age of 21 may decrease gun activities among young adults (Vittes, Vernick, and Webster, 2013). Since adolescents typically socialize in peer groups of similar ages, this would prevent middle-school and high-school youth from being able to purchase or gain access to firearms during unstructured activities. In addition, school- and community-based initiatives for gun violence should be implemented, especially for those most at risk for committing violent acts (Astor et al., 2013). This would involve strengthened attention to mental health needs in the community and increased efforts to limit the access to guns in the community (Astor et al., 2013; Vittes, Vernick, and Webster, 2013).

Likewise, the availability of this type of research will help the legal, public health, public safety, community, and health systems gain more knowledge about these issues,

which can result in increased awareness and the development of social policy to dealing with adolescents getting hurt, being violent, and getting caught up in the justice system. The attention to reduce substance use and handgun carrying may decrease rates of offending, especially with violent offenses, such as school shootings.

III. Limitations and Suggestions for Future Research

Despite the importance of the results identified in Chapter 5 and their relevance for theoretical and policy implications, certain limitations should be addressed. First, while the Baron and Kenny (1986) method of mediation analysis has been used successfully in previous research, there are other more contemporary options to assess mediation. Future research should utilize structural equation modeling to confirm similar results pertaining to the mediating role of ease of access in the unstructured socializing – substance use and unstructured socializing – handgun carrying relationships. Similarly, while more advanced methods for handling missing data could have been employed, for this dissertation, I elected to use listwise deletion without any imputation procedures, since the sample remained large after the removal of cases with missing data. However, this is still a limitation worth noting.

Second, the design of this study was cross-sectional, and even though the recall period for the substance use outcomes was the past 30 days and handgun carrying outcomes was past 12-months, correct temporal-ordering is not assured. Additionally, the temporal ordering of the unstructured socializing and ease of access association might be a bit problematic. The unstructured socializing variable measure hours per week but does not specify which week, and the ease of access variable measures ease of access to substances and handguns in present time. It would be important to determine if the

findings in this study would hold up within a longitudinal framework. Third, this study controlled for an array of variables that could potentially predict substance use and handgun carrying, and render spurious the effects of unstructured socializing with peers, but it cannot be ruled out that some omitted variable bias does exist given that the study is correlational and non-experimental. Fourth, since this study utilized data from the FYSAS, it is somewhat questionable how generalizable the results are to the national population of middle-school and high-school students.

Fifth, the ease of access measure is heavily weighted toward soft drug use. Since the study also focused on hard drugs, the lack of a measure available that focuses on this may result in bias. Specifically, there was an ease of access variable that measured the ease of access to all the soft substances used in this study, but the ease of access to hard drug variable only reflected LSD, cocaine, and amphetamines. Sixth, the author is unaware of where the unstructured socializing took place given the data used. This would require space-time budget data (e.g., Hoeben & Weerman, 2014), another avenue for future research to consider when investigating the mediating role of ease of access for the relationships between unstructured socializing, substance use, and handgun carrying.

In addition to the above limitations, it would be instructive for future research to refine and broaden measures of unstructured socializing with peers for more precise results, by utilizing dichotomized variables for each hourly increment in order to assess where the risk of substance use and handgun carrying begins as a result of time spent engaged in unstructured socializing, from an hourly standpoint. Additionally, future research should consider the associations between unstructured socializing with peers and ease of access to substances and handguns as they change over time. Ultimately, future

research should investigate ways to decrease both the perceptions of access, and actual access to substances and handguns in order to prevent use and abuse as well as carrying and possession. This would better identify if policy changes to address ease of access, substance use, and handgun carrying among adolescents are effective and provide additional insight into what other aspects of substance use and weapon carrying need to be tackled in the future.

8.2 The Moderating Role of Gender

Chapter six employed Osgood et al.'s (1996) routine activity theory to further examine the relationships between unstructured socializing, substance use, and gun carrying. Specifically, this chapter sought to examine how gender moderated the association between unstructured socializing with peers and drug use, and unstructured socializing with peers and handgun carrying. The results from the chapter are summarized below.

I. Results from Chapter Six

Chapter six tested the third and fourth hypotheses. The third hypothesis tests the effect of unstructured socializing with peers (IV) on substance use (DV) when moderated by gender (MoV). It is anticipated that being male will amplify the effect of unstructured socializing with peers on substance use. The fourth hypothesis tests the effect of unstructured socializing with peers (IV) on handgun carrying (DV) when moderated by gender (MoV). It is anticipated that being male will amplify the effect of unstructured socializing with peers on handgun carrying.

The first main finding in Chapter 6 is that the effect of unstructured socializing on soft drug use significantly varies by gender. Specifically, it was found that the effect of

unstructured socializing on soft drug use is stronger for females than it is for males. This supports the assumption that gender moderates the association between unstructured socializing and soft drug use, but does not support the third hypothesis, which suggested the effect would be stronger for males.

The second main finding in Chapter 6 is that the effect of unstructured socializing on hard drug use does not significantly vary by gender. Thus, gender does not moderate the association between unstructured socializing and hard drug use. This finding does not support the assumption made in the third hypothesis, which predicted that gender would moderate the association between unstructured socializing and hard drug use, and that being male will amplify the effect of unstructured socializing with peers on hard drug use.

The third main finding in Chapter 6 is that the effect of unstructured socializing on handgun carrying does not significantly vary by gender. Thus, gender does not moderate the association between unstructured socializing and handgun carrying, which is inconsistent with the assumption made in the fourth hypothesis.

Furthermore, when investigating gender differences among the relationship between unstructured socializing and individual soft substances, it can be seen that the effect of unstructured socializing with peers on alcohol consumption does significantly vary by gender. First, the association between unstructured socializing and alcohol consumption is stronger for females. Thus, this supports the idea that there are gender differences in the effect of unstructured socializing on alcohol consumption, but is contradictory to hypothesis three, which suggested that the effect would be greater for males. Second, it was found that the effect of unstructured socializing with peers on the

use of cigarettes does not significantly vary by gender. There is some evidence that suggests that the association between unstructured socializing and cigarette use may be stronger for males, but not enough to support the third hypothesis.

Third, it was found that the effect of unstructured socializing with peers on the use of e-cigarettes does not significantly vary by gender. Last, it was found that the effect of unstructured socializing with peers on the use of marijuana does not significantly vary by gender. Overall, these findings do not support the idea that gender moderates the association between unstructured socializing and e-cigarette use and unstructured socializing and marijuana use. The following section will discuss the policy and theory-relevant implications pertaining to these results.

II. Implications

Through this research, the following important implications arise. First, while Osgood et al. (1996) acknowledged that some adolescents were more susceptible to the situational incentives offered by leisure time than others, at the same time, the researchers concluded that all adolescents were susceptible to such incentives. However, the variability in the risk that unstructured socializing might pose has gone unnoticed in previous research. Specifically, research is limited and inconclusive on the variability in the effect that unstructured socializing poses for antisocial behavior according to individual characteristics such as gender (Augustyn & McGloin, 2013; Moffitt et al., 2001; Piquero et al., 2005). This research is important because it explores the ways in which gender differentiates the influence of unstructured socializing with peers on substance use and handgun carrying.

As previously mentioned in Chapter six, there are vast differences between the characteristics and circumstances of leisure time for boys and girls (Athenstaedt, Mikola, & Bredt, 2009; Eder & Parker, 1987; Hilbrecht, Zizanek, & Mannell, 2008). Furthermore, previous research suggest that girls and boys are socialized differently, which results in a wide-range of varying behaviors among genders (Augustyn & McGloin, 2013). While boys tend to act more aggressively and are often given more freedom with their extracurricular activities than girls, it is often assumed that boys will act more deviant than girls given that they are allowed more freedom and are taught to be tough and dominant (Leaper & Friedman, 2007; Pleck, Sonenstein, & Ku, 1994; Perry & Pauletti, 2011; Wearing, Wearing, & Kelly, 1994).

However, given the results of this study, that found gender to moderate the association between the variety index of soft drug use and the specific drug use of alcohol, it can be concluded that the effect of unstructured socializing on the variety index of hard drugs, other various individual substances, and handgun carrying are not moderated by gender, which is a finding that is inconsistent with previous research (Augustyn & McGloin, 2013; Hemenway et al., 1996; Lizotte et al., 2000; Meldrum et al., 2020; Vaughn et al., 2012). Specifically, these findings reveal that girls are just as, and if not more susceptible, to delinquent behavior as boys. This can result for two reasons. First, girls are expected to be non-violent and are discouraged from engaging in crime as this is not consistent with the female identity. They are also required to abide by greater levels of control and parental monitoring during their adolescents. This level of control and parental monitoring, which differs from the level of parental monitoring that

boys tend to be scrutinized to, may result in girls wanting to act out (Pettit et al., 2001; Yoo, 2017).

Furthermore, since the results suggest that gender does not moderate the association between unstructured socializing and hard drugs, and handgun carrying, cigarette, e-cigarette, and marijuana use, it can be assumed that differing socialization and parenting strategies between female and male adolescents do not work to prevent adolescents from engaging in certain delinquent behavior. Thus, from a strategic standpoint, it might be advantageous for parents to engage in the same practices when socializing both boys and girls and helping them discover their unique identities. These practices may go against what is acceptable and deemed standard by society, but it could assist parents in preventing more serious delinquent behaviors from both girls and boys during their adolescent years.

III. Limitations and Suggestions for Future Research

Osgood et al.'s (1996) study suggested that crime among adolescents results from situational motivation. During these situations, peer induced temptations are likely experienced by both adolescent males and females. However, these induced temptations in the presence of opportunity will likely translate differently depending on the qualities and characteristics that adolescents are taught during socialization. With that said, the type of unstructured activity that an adolescent is engaged in may present different opportunities for deviance based on gender. Unfortunately, this is not something that could be examined in this study as the data does not allow for the investigation of type of unstructured activity. Future research should consider investigating gender differences in the association between specific unstructured socializing activities and various delinquent

behavior. From a policy standpoint, if we know which unstructured activities are more detrimental to boys and girls, this could refine future policy on socializing. This would also provide schools, parents, and communities with the information needed in terms of gender differences to prevent gender specific deviant behavior, such as substance use and handgun carrying.

Furthermore, as previously explained, this study used list-wise deletion to deal with missing data. Considering that using listwise deletion resulted in males being more likely to be excluded from my analysis, this could result in the contradictory findings that suggest females are more likely to use drugs and carry handguns. Future research should employ imputation procedures to deal with missing data to avoid case loss, which could lead to result bias.

Moreover, since the data used in this study represents only Florida youth, it is not nationally representative of the gender differences in the effects of unstructured socializing on substance use and handgun carrying. Additionally, the measure of unstructured socializing used in this study also does not specify when the unstructured activities are occurring. It would be beneficial for future research to measure when adolescents are spending their unstructured time, such as whether it is on the weekend or spread out during the week. This type of information could also benefit future policy and parental monitoring techniques.

8.3 The Moderating Role of Bonds with Parents, Bonds at School, and Neighborhood Disorder

Chapter seven sought to examine how bonds with parents, bonds at school, and neighborhood disorder moderate the association between unstructured socializing with

peers and drug use, and unstructured socializing with peers and handgun carrying. This chapter utilized Osgood et al.'s (1996) routine activity theory to further examine the relationships between unstructured socializing, substance use, and gun carrying. The results from the chapter are summarized below.

I. Results from Chapter Seven

Chapter seven tested hypotheses five through ten. The fifth hypothesis tests the effect of unstructured socializing with peers (IV) on substance use (DV) while being moderated by social bonds with parents (MoV). It is anticipated that greater bonds and social support from parents will diminish the effect of unstructured socializing with peers on substance use. The sixth hypothesis tests the effect of unstructured socializing with peers (IV) on handgun carrying (DV) while being moderated by social bonds with parents (MoV). It is anticipated that greater bonds and social support from parents will diminish the effect of unstructured socializing with peers on handgun carrying.

The seventh hypothesis tests the effect of unstructured socializing with peers (IV) on substance use (DV) while being moderated by bonds at school (MoV). It is anticipated that greater bonds at school will diminish the effect of unstructured socializing with peers on substance use. The eighth hypothesis tests the effect of unstructured socializing with peers (IV) on handgun carrying (DV) while being moderated by bonds at school (MoV). It is anticipated that greater bonds at school will diminish the effect of unstructured socializing with peers on handgun carrying. The ninth hypothesis tests the effect of unstructured socializing with peers (IV) on substance use (DV) while being moderated by neighborhood disorder (MoV). It is anticipated that greater levels of neighborhood disorder will amplify the effect of

unstructured socializing with peers on substance use. The tenth hypothesis tests the effect of unstructured socializing with peers (IV) on handgun carrying (DV) while being moderated by neighborhood disorder (MoV). It is anticipated that greater levels of neighborhood disorder will amplify the effect of unstructured socializing with peers on handgun carrying.

a. Bonds with Parents

The first main finding from Chapter 7 is that that the effect of unstructured socializing on soft drug use significantly varies by level of adolescent bonds with parents. Specifically, the results suggests that the association between unstructured socializing and soft drug use is amplified for those individuals that reported stronger bonds with parents. While this supports the idea that bonds with parents moderate the association between unstructured socializing and soft drug use, this contradicts the fifth hypothesis, which predicted that the effect of unstructured socializing on substance use would be diminished among those with stronger bonds to parents.

Second, the study in Chapter 7 indicated that the effect of unstructured socializing on hard drug use does not significantly vary by levels of parental bonds. This in no way suggests that bonds with parents moderates the associations between unstructured socializing and hard drug use and does not support the fifth hypothesis.

The third research finding in Chapter 7 found that the impact of unstructured socializing on handgun carrying does not significantly vary by levels of parental bonds. This does not support the idea that bonds with parents moderates the association between unstructured socializing and handgun carrying and does not support the sixth hypothesis.

b. Bonds at School

The fourth key finding in Chapter 7 states that the effect of unstructured socializing on soft drug use significantly varies by levels of school bonds. Specifically, the results indicate that the association between unstructured socializing and soft drug use is stronger for those individuals that reported stronger bonds at school. While this supports the idea that bonds at school moderate the association between unstructured socializing and soft drug use, this contradicts the seventh hypothesis, which predicted that the effect of unstructured socializing on substance use would be diminished among those with stronger bonding.

The fifth major finding in Chapter 7 is that the effect of unstructured socializing on hard drug use does not significantly vary by levels of school bonds. Additionally, this does not support the idea that bonds at school moderate the association between unstructured socializing and hard drug use and does not support the seventh hypothesis.

In Chapter 7, the sixth important takeaway is that the effect of unstructured socializing on handgun carrying does not significantly vary by levels of school bonds. This finding does not support the idea that bonds at school moderate the association between unstructured socializing and handgun carrying and does not support the eighth hypothesis.

c. Neighborhood Disorder

The seventh main finding in Chapter 7 indicates that the effect of unstructured socializing on soft drug use does not significantly vary depending on the level of neighborhood disorder. This does not support the notion that neighborhood disorder

moderates the association between unstructured socializing and soft drug use and does not support the ninth hypothesis.

The eighth significant conclusion in Chapter 8 is that the effect of unstructured socializing on hard drug use does not significantly vary by levels of neighborhood disorder. This does not support the notion that neighborhood disorder moderates the association between unstructured socializing and hard drug use and does not support the ninth hypothesis.

In Chapter 7, the ninth major finding suggests the effect of unstructured socializing on handgun carrying significantly varies by neighborhood disorder. This finding indicates that the effect of unstructured socializing on handgun carrying is stronger for youth who reside in neighborhoods with greater levels of neighborhood disorder. This result supports the tenth hypothesis, which was that the effect of unstructured socializing on handgun carrying would be greater for individuals that live in neighborhoods with greater neighborhood disorder.

Lastly, when investigating if bonds with parents, bonds at school, and neighborhood disorder moderated the relationship between unstructured socializing and individual soft substances, it can be seen that the effect of unstructured socializing on alcohol consumption, cigarette use, e-cigarette use, and marijuana does not significantly vary by bonds with parents, bonds at school, and neighborhood disorder. The below section will discuss the policy and theory-relevant implications that can arise from these results.

II. Implications

Previous research established that the effect of unstructured socializing on drug use is amplified for youth that have weaker bonds with parents (Bernburg and Thorlindsson, 2001; Bernburg and Thorlindsson, 2007; Gage et al., 2005; Galambos and Maggs, 1991; Pettit et al., 1999). However, the results found in this study are contradictory to previous research. The results suggest that stronger bonds with parents result in an amplified effect of unstructured socializing on drug use. Thus, those adolescents that have better relationships with their parents may be more inclined to engage in drug use when presented with the opportunity in unstructured settings. This may be due to the dynamic of the relationship that these adolescents have with their parents. Those adolescents that have better relationships with their parents may have a higher-level of trust and lower levels of monitoring. This would allow for greater permitted time to hang out with peers in unstructured settings since parents who have a closer bond with their children tend to have better levels of communication, openness, and involvement (Fergus & Zimmerman, 2005). This allowed time to hang out with friends in unstructured settings can create the opportunity to engage in substance use even though the parental bonding element is still present.

Furthermore, previous studies demonstrate a strong pattern of protective effects from parental ties, involvement, and supervision on reducing the odds of handgun carrying (Vaughn et al., 2012). However, the results in this study are inconsistent with previous research, in that the effect of unstructured socializing on handgun carrying does not vary by the level of parental bonds. Nonetheless, from a strategic standpoint, this may

still suggest the need for parents to make it a priority to build better relationships with their children to protect them from exposure to deviant behavior.

Moreover, the results in this study also suggest that the effect of unstructured socializing on soft drug use is amplified for those who have a stronger bond at school. This finding is inconsistent with previous research as the effect of unstructured socializing with peers on general delinquency was found to be weaker for adolescents who felt stronger bonds to their teachers and school work, did not experience school strain, and participated in extracurricular activities (Bernburg & Thorlindsson, 2001; Gage et al., 2005). This inconsistent finding may be the result of more exposure to peers at school. Those adolescents who feel bonded at school and actively participate in the learning experience might simultaneously be making friends who will later expose them and present them with the opportunity to engage in substance use and other delinquent behavior.

Additionally, the results suggest that the effect of unstructured socializing on gun carrying does not vary by levels of school bonds. However, previous research suggests that students who feel appreciated for their activity at school and are bonded to their school tend to have a decreased risk of engaging in minor and serious delinquency (Chung et al., 2002; Loeber et al., 2004; Parcel et al., 2010). This premise extended to the idea that lower levels of school bonding increases youth handgun carrying as a result of the influence from time spent in unstructured socializing because the lack of attachment to school would encourage adolescents to engage in delinquent behavior, such as handgun carrying.

Ideally, schools should make a priority to keep students interested, appreciated, and engaged to prevent not only unstructured activities, but also handgun carrying, and violent acts that may result from handgun carrying. Adolescents who do not feel bonded at school may be inclined to seek attachment and friendships from other peers who also do not feel bonded. This could result in association with delinquent peers that introduce others to gang membership. The introduction to gangs could result in the exposure to weapons, and especially guns (Huebner et al., 2007; Skiba et al., 2004). Further, since these adolescents do not feel bonded at school, they may be susceptible to the risk of peer pressure, which could also result in carrying guns (May, 1999). This could be detrimental to those adolescents who would not seek advice or counseling from school personnel since they feel detached. Schools should make an effort to offer help and counseling, especially for those at higher risk for exposure due to their lack of bonding to school activities and personnel.

Lastly, previous literature suggests that the effect of unstructured socializing with peers on general delinquency was stronger for adolescents who resided in neighborhoods with lower levels of collective efficacy and in neighborhoods rated as unsafe (Bernburg & Thorlindsson, 2007; Gage et al., 2005; Maimon & Browning, 2010; Pettit et al., 1999). However, the results from Chapter 7 do not support the idea that high levels of neighborhood disorder amplify the relationship between unstructured socializing and hard drug use. This research does suggest, however, that neighborhood disorder amplified the relationship between unstructured socializing and gun carrying among youth. Another finding that supported the efforts of previous research (Johnson, Jang, Li, & Larson, 2000; Meldrum et al., 2020; Vowell & Howell, 1998). These results imply that families

should do their research on where they decide to live and have their children go to school as this could have negative consequences on their child's behavior, influence delinquency, and decline their overall experience as they navigate through young adulthood.

III. Limitations and Suggestions for Future Research

While the findings in this study only minimally supported various aspects of previous literature, there are several limitations that merit discussion in addition to the ones previously mentioned, which are also relevant here. For this study, a split-sample analysis was utilized for each moderating variable to assess whether the effect of unstructured socializing on each of the outcomes is significantly different across the split-samples. However, it is worth noting that that split-sample was estimated based on the risk groups that were assumed by the author to be the bottom 25% of scores and the top 75% of scores for parental and school bond, and top 25% of scores and the bottom 75% of scores for neighborhood disorder. It would be interesting for future research to consider if the result would hold up in a different split-sampling approach, such as a 50% split for bottom and top measures or a 30% and 70% split. Additionally, future research should investigate other moderating variables, such as individual traits, genetic composition, socioeconomic status, and the dynamic of the peer groups with whom adolescents spend their unstructured time.

8.4 Conclusion

This dissertation sought to provide an important addition to previous research on unstructured socializing with peers, adolescent substance use, and handgun carrying

while also adding to future policy by providing new avenues by which to better identify the predictors of drug use and handgun carrying.

The study makes three important contributions. First, identifying variables that moderate and/or mediate the association between unstructured socializing and substance use and handgun carrying has theoretically relevant implications. This research finds support for Osgood and colleagues (1996) in the way that unstructured socializing is positively associated with various delinquent behaviors, including substance use and handgun carrying. The findings also have the potential to reduce substance use, handgun carrying, and violence, by focusing on the reduction of access to substances and handguns, promoting less time in unstructured socializing, and accounting for external factors and their effects on delinquency. Thus, reducing substances and handguns within the home, limiting unsupervised adolescent time with friends, and taking into consideration bonds at school and to parents, and neighborhood disorder may aid in reducing adolescent delinquent behaviors and potentially violence, such as school shootings.

Second, this research brings public awareness to the issues surrounding substance use and handgun carrying, provides a means to further understand the issue, and aids in future opportunities to remedy the problem. By better understanding what influences substance use and handgun carrying, communities, schools, and parents can work together to advocate for strategic innovative programs to discourage these behaviors. Last, understanding the relationship between unstructured socializing and substance use and handgun carrying results in policy-relevant implications at both the federal and community levels, and can lead to intervention and prevention strategies that will

decrease substance use, handgun carrying, and possibly even gun violence among adolescents.

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VITA

ANNA LEIMBERG

	Born, Moscow, Russia
2010 – 2013	Associate of Arts in Humanities and Social Sciences
	Rockland Community College
	Suffern, New York
2013 – 2015	Bachelor of Science in Sociology
	Barry University
	Miami, FL
2015 – 2017	Master of Science in Criminal Justice
	Florida International University
	Miami, Florida
2017 – 2021	Ph.D. in International Crime and Justice
	Florida International University
	Miami, Florida
2015 – 2018	Teaching Assistant
	Florida International University
	Miami, Florida
2015 – 2018	Research Assistant
	Florida International University
	Miami, Florida
2018	Provost's Hybrid Pilot Program
	Florida International University

	Miami, Florida
2020	Dissertation Year Fellowship Award
	Florida International University
	Miami, Florida
2018 – present	Adjunct Instructor
	Florida International University
	Miami, Florida
2021 – present	Adjunct Instructor
	Barry University
	Miami, Florida

SELECTED PUBLICATIONS AND PRESENTATIONS

Leimberg, A., & Lehmann, P. S. Forthcoming. Unstructured socializing with peers, low self-control, and substance use. *International Journal of Offender Therapy and Comparative Criminology.*

Kutateladze, B. L., & Leimberg, A. (2019). The influence of type of defense counsel on prosecutorial and judicial decision making in domestic violence cases. *Crime & Delinquency*, *65*(12), 1623-1647.

Meldrum, R. C., & Leimberg, A. (2018). Unstructured socializing with peers and risk of substance use: Where does the risk begin? *Journal of Drug Issues*, *48*(3), 452-471.

"Unstructured Socializing with Peers, Ease of Access, Substance Use, and Handgun Carrying" presented at the annual meeting of the *American Society of Criminology* (San Francisco, 2019).

"Unstructured Socializing with Peers, Low Self-Control, and Substance Use," presented at the annual meeting of the *American Society of Criminology* (Atlanta, 2018).

"The Influence of Type of Defense Counsel on Prosecutorial and Judicial Decision Making in Domestic Violence Cases," presented at the annual meeting of the *American Society of Criminology* (Philadelphia, 2017).