Advancing General Strain Theory: Three Empirical Studies

by

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A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

Approved July 2018 by the
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ARIZONA STATE UNIVERSITY
August 2018
ABSTRACT

The main premise of general strain theory (GST) is that strains and stressors increase negative emotions, such as anger and depression, which ultimately influence coping—criminal and otherwise (Agnew, 1992). Though there is a lot of research in support of the core arguments of GST, gaps in the knowledge base remain. For example, most researchers have focused on particular types of strains, overlooking nontraditional forms. And though the negative impact of deviant peers on delinquency is well documented, the influence of such peers in terms of coping with negative emotionality is not well understood. This dissertation investigates the relationship between unconventional strains—teenage pregnancy and low social support—on negative outcomes. In addition, this project also examines friendship networks to see whether peer victimization increases personal involvement in violent offending. Additionally, the impact of deviant peers within the GST framework is also tested.

This dissertation uses existing data from Waves I (1994-1995) and II (1996) of the National Longitudinal Study of Adolescent to Adult Health (Add Health). The Add Health is a longitudinal, nationally representative sample of over 20,000 American adolescents who were in grades 7 through 12 during the 1994-1995 school year. Data were drawn from two sources—the in-home interview data and the social network data. Multivariate regression models are used to examine the effects of strain on a number of outcomes of theoretical interest.

The findings indicate that teenage pregnancy, peer victimization, and low social support were all associated with depressive symptoms and deviant coping. More specifically, the results from study one showed that adolescents who had experienced
pregnancy were more likely to experience depressive symptoms and engage in substance use behaviors. Depression failed to mediate the relationship between pregnancy and substance use. Teenage pregnancy, depression, and deviant peers interact to amplify alcohol-related problems and marijuana use. In study two the findings revealed that peer victimization was positively related to depression and violent offending. Furthermore, the relationship between peer victimization was partially mediated by depression. Lastly, the findings from study three showed that low social support was associated with depression and delinquency. Consistent with GST, the relationship between low social support and delinquency was fully mediated by depression. Implications for practice and directions future research are discussed.
ACKNOWLEDGMENT

I would like to express my sincere gratitude and appreciation to my dissertation chair and mentor, Dr. Michael Reisig, for his patience, guidance, and detailed feedback. I am very blessed to have been given the opportunity to work under your leadership. I would also like to thank my committee members, Drs. Kristy Holtfreter and Jacob Young, for their constructive feedback throughout this process. This dissertation would have been nearly impossible without the collaborative effort from you all.

Secondly, I would like to thank my peers and colleagues for their support, feedback, and friendship during my time here at Arizona State University.

Finally, I would like to extend my deepest gratitude to my family and friends for their love and encouragement. This journey would have been much more difficult without their support. Thank you all.

This research uses data from Add Health, a program project directed by Kathleen Mullan Harris and designed by J. Richard Udry, Peter S. Bearman, and Kathleen Mullan Harris at the University of North Carolina at Chapel Hill, and funded by grant P01-HD31921 from the Eunice Kennedy Shriver National Institute of Child Health and Human Development, with cooperative funding from 23 other federal agencies and foundations. Special acknowledgment is due Ronald R. Rindfuss and Barbara Entwisle for assistance in the original design. Information on how to obtain the Add Health data files is available on the Add Health website (http://www.cpc.unc.edu/addhealth). No direct support was received from grant P01-HD31921 for this analysis.
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CHAPTER 1
INTRODUCTION

A central question in the field of criminology is why individuals break the law. Indeed, the scientific study of criminal offending is prominently featured in Sutherland’s (1947) definition of criminology, which has guided the direction of the discipline for several decades. Alternative definitions established by other pioneers in the field, such as Wolfgang (1963), also include the scientific study of crime (also see Jeffery, 1959). In short, regardless of the definition one prefers, it is safe to say that testing theories of crime causation has and remains an integral part of the criminological enterprise.

Empirically testing of crime theories is not purely an intellectual exercise. This undertaking has identified several key factors that cause crime and delinquency, all of which serves to inform public policy regarding the effective prevention, reversal, and suppression of crime.

Since the early 1900s, criminologists have worked to develop and test explanations of criminal behavior. These theories highlight the effects of individual traits (Glueck & Glueck, 1950; Gottfredson & Hirschi, 1990), social learning (Akers, 1973; Sutherland, 1947), social control (Hirschi, 1969; Sampson & Laub, 1993), features of the urban environment (Sampson & Groves, 1989; Shaw & McKay, 1942), and strain (Agnew, 1992; Merton, 1938). Many of these theories hold that deviant peers play an important role—sometimes direct and other times indirect—in facilitating crime and delinquency (Agnew, 1991; Augustyn & McGloin, 2013).

Social control and learning theories have dedicated a significant amount of attention to examining deviant peer effects. The scope of influence that delinquent peers...
have on friends’ behavior transcends breaking the law. Indeed, antisocial peers are associated with substance use and a variety of crime-analogous behaviors (e.g., risky sexual practices) during adolescence and early adulthood (Agnew & White, 1992; Barnes, Hoffman, Welte, Farrell, & Dintcheff, 2006; Dishion, Ha, & Véronneau, 2012).

In a comparative sense, the amount of attention scholars working in the general strain tradition have paid to the role of deviant peers is very modest. The main premise of Agnew’s (1992) general strain theory (GST) is that stressful life events increase the risk of negative emotions, like anger and frustration. Consequently, these emotions create pressure for corrective action, crime being one of the possible ways to cope. Although GST enjoys considerable empirical support (see Agnew & White, 1992; Daniels & Holtfreter, 2018; Hay & Meldrum, 2010; Mazerolle & Piquero, 1997; Moon, Morash, McCluskey, & Hwang, 2009; Patchin & Hinduja, 2011; Piquero & Sealock, 2010; Rebellon, Manasse, Van Gundy, & Cohn, 2012; Thraxton & Agnew, 2017), few studies have considered the role of deviant peers. For example, Agnew and White (1992) found that delinquency and drug use increases among individuals who experience strain and associate with deviant peers (also see Mazerolle & Maahs, 2000). Agnew and colleagues (2002) found that juveniles who are high in negative emotionality and low in constraint were more likely to cope with strain in a deviant manner. Associating with delinquent peers potentially increases deviant and criminal coping response among those who experience strain. To date, deviant/delinquent peers in a GST framework has been limited. This leaves questions unanswered, such as whether deviant peer association moderates the influence of strain on negative emotions, and whether peers condition the relationship between negative emotions and maladaptive behavior.
In light of these gaps in literature, this dissertation seeks to investigate the influence of deviant peers on negative emotionality and coping behaviors within a GST framework. The primary research question of this dissertation is as follows: Do deviant peers moderate the relationship between strain and negative outcomes? For example, are individuals who experience strain and associate with deviant peer groups more likely to experience negative emotionality? Are individuals who experience negative emotions more likely to cope in a maladaptive fashion (e.g., use illegal drugs and violate the law) if their friends engage in deviant behavior? To answer these and related questions, several waves of data from the National Longitudinal Study of Adolescent to Adult Health (Add Health) are used. Add Health is a rich source of longitudinal data on social, behavioral, environmental, and biological factors.

The next section identifies and discusses the core arguments of several prominent theories of crime causation. Along the way, the weight of the empirical support is considered, as are the weaknesses of each theory. The primary objective of the following section is to highlight and demonstrate why GST is an appealing theoretical framework for understanding crime causation.

Theories of Crime Causation

Criminologists have long been interested in the etiology of crime. Over the past several decades, numerous theories that explain such behavior have been advanced. This section reviews some of the important theories in the field and the empirical support that each of them enjoys. Various limitations and shortcomings associated with each theory will also be highlighted and considered.
**Social Control Theory**

Among the most well-known theories of crime is Travis Hirschi’s (1969) social control theory, which was first presented in his classic book, *Causes of Delinquency*. Although most criminological theories focus on why people commit crime, social control theory attempts to explain why people *do not* commit crime. Hirschi argues that adequate socialization among individuals leads to strong bonds between individuals and society. These strong bonds prevent individuals from engaging in criminal behavior. But when bonds to conventional society are weakened or broken, individuals are more likely to commit crime.

The theory identifies four elements of the bond, the first of which is attachment. This aspect of the bond is defined as the sensitivity to and interest in others (Hirschi, 1969). Arguably, when individuals are insensitive to the opinion of others, then they are more likely to commit crime. In contrast, strong attachment to parents and prosocial institutions are beneficial as they serve as a source of social control, ultimately deterring youth from wayward behavior. A second element, commitment, refers to an individual’s investment in conventional lines of actions, such as their formal education. Those who are committed to conventional lines of action typically weigh the risks of engaging in criminal behavior, which could include jeopardizing their reputation and social status. In short, individuals are less likely to engage in crime when they have something of value to lose. Hirschi describes the third element, involvement, as the time and energy spent participating in conventional activities. He argues that the more time and energy individuals spend being involved in conventional activities (e.g., doing homework, working, and playing sports), the less time they have to engage in lawbreaking behavior.
Conventional activities serve as a form of informal social control. The final element, belief, refers to the degree of respect individuals have for moral order and law of conventional society. Individuals are less likely to engage in delinquency when they believe that they should obey societal rules.

There is a significant amount of empirical support for Hirschi’s (1969) theory (see, e.g., Agnew, 1985; Hindelang, 1973; Johnson, 1979; Krohn & Massey, 1980; Wiatrowski, Griswold & Roberts, 1981). However, the theory was originally developed to explain delinquency, thus limiting its explanatory scope to misbehavior at a single stage in the life course. More recently, however, scholars working in the social control tradition have turned their attention to the task of explaining crime over the life course.

Sampson and Laub’s (1993) age-graded theory of social control builds on Hirschi’s (1969) theoretical framework and attempts to explain offending into and throughout adulthood. Their theory asserts that some delinquent individuals will continue offending throughout their life. However, they also contend that some criminally-involved individuals will experience “turning points,” such as meaningful employment, military service, and supportive marriages, which will result in a law abiding lifestyle. These institutions serve as sources of informal social control (King, Massoglia, & MacMillan, 2007; Laub, Nagin, & Sampson, 1993; Sampson, Laub, & Wimer, 2006; Uggen, 2000; Warr, 1998). Laub and Sampson (2003) argue that turning points allow individuals to “knife off” their past from the present, change their routine activities, provide opportunities for identity transformation, and serve as a source of supervision and social support—all of which promote desistance from crime.
Social control theory has laid the foundation for delinquency research for several decades. Prior research assessing the theory excluded strain variables (e.g., discrimination and emotional/physical abuse) or paid minimal attention to them (see Agnew, 1991). According to Agnew (1992), GST is distinct from social control theory in two ways: (1) the various types of relationships that cause delinquency, and (2) the motivation for delinquency. Social control theory is concerned with the absence of significant relationships with conventional others and institutions. In contrast, GST focuses on hostile relationships that are often the result of negative emotions brought about by stressful events. Emotion is a key factor in strain theory. Social control theory attributes delinquency primarily to the absence of strong social ties.

Although social control theory has enjoyed much attention, some criminologists argue that the establishment of strong social bonds is dependent on a host of factors, including individual variations in self-control, which also directly influence crime and delinquency (see Hay, 2001; Wright, Caspi, Moffitt, & Silva, 1999).

Low Self-Control Theory

Gottfredson and Hirschi’s (1990) self-control theory was introduced in their book, *A General Theory of Crime*. Their explanation has been one of the most tested criminological theories over the past quarter century. The theory holds that low self-control is the main source of crime and crime-analogous behaviors. According to Gottfredson and Hirschi, individuals who lack self-control tend to be physical, insensitive, risk-taking, shortsighted, and non-verbal. In addition, those who lack self-control also have the tendency to pursue their self-interest at the expense of others, and are more likely to behave in a manner that they believe will yield immediate gratification.
Gottfredson and Hirschi claim that self-control is developed in early childhood (i.e., between the age of 8 and 10), primarily through socialization by parents and caregivers, and after that it remains relatively stable throughout the life course.\(^1\) In short, the authors argue that self-control is the result of lackluster parenting, which includes the failure to properly supervise/monitor youth, recognize and punish wayward behavior, and the like. The failure to develop adequate levels of self-control is consequential at later stages of the life course.

A large and growing roster of studies show that low self-control is a robust predictor of criminal behaviors (Pratt & Cullen, 2000; Schoepfer & Piquero, 2006; Vazsonyi & Crosswhite, 2004) delinquency (Chapple, 2005; Hay, 2001), imprudent behavior (Arneklev, Grasmick, Tittle, & Bursik, 1993; Reisig & Pratt, 2011), violence (Piquero, MacDonald, Dobrin, Daigle, & Cullen, 2005), victimization (Holtfreter, Reisig, & Pratt, 2008; Pratt, Turanovic, Fox, & Wright, 2014; Schreck, 1999; Turanovic, Reisig, & Pratt, 2015), and the victim-offender overlap (Holtfreter, Reisig, Piquero, & Piquero, 2010; Reisig & Holtfreter, 2018). In short, available theory and research indicate that people with low self-control are not only more likely to commit crime and engage other forms of deviance, but they are also more likely to experience criminal harm.

GST differs from trait theories, like low self-control theory, in that it is concerned with the social environment. Nevertheless, GST is compatible with the concept of self-control (see Agnew, 2006; Agnew, Brezina, Wright, & Cullen, 2002). As previously mentioned, individuals with low self-control are seen as impulsive, risk-taking, and insensitive to the feelings of others. Those with negative emotional traits tend to be easily

\(^1\) Gottfredson and Hirschi’s assumption regarding the stability of self-control has been challenged (see Agnew, Scheurman, Grosholz, Isom, Watson, & Thaxton, 2011; Burt, Simons, & Simons, 2006; Burt, Sweeten, & Simons, 2014; Hay & Forrest, 2006).
upset and angered, blame others for their problems, and interact with people in an aggressive or antagonistic manner. Consequently, individuals with these specific personality traits are less likely to cope with strain in a healthy manner, as they usually act impulsively without thinking, lack the necessary social skills needed for legal coping, not aware of or concerned about the consequences of their criminal acts, and are generally more inclined to crime (see Agnew, 2006). Arguably, individual levels of self-control condition key GST variables (i.e., strain and negative emotions) in a manner that elevates the likelihood of expected outcomes (i.e., negative emotions and criminal outcomes). Though important differences exist, the two theories are compatible with one another.

Routine Activity Theory

Cohen and Felson (1979) introduced routine activity theory to the field of criminology. The theory initially focused on aggregate level changes in crime rates, holding that the latter are influenced by structural changes in routine activities that allow three elements to converge in time and space. These three elements are: (1) the presence of a motivated offender (e.g., teenage boys), (2) a suitable target (e.g., easily transportable goods), and (3) the absence of a capable guardian (e.g., home owners and police officers). These elements have been referred to as the chemistry for crime (Felson and Boba, 2010). According to Cohen and Felson, the increase in crime rates after World War II was the result of changing routine activities throughout society. More specifically, as the routine activities of the public increasingly shifted away from their homes, criminal opportunities increased dramatically.
Routine activity theory has also been used to predict individual-level criminal behavior. In particular, Osgood and colleagues (1996) extended routine activity theory by arguing that unstructured socializing with peers in the absence of capable guardians creates opportunities for crime and other deviant behavior. Their argument is threefold: (1) the presence of peers makes deviant acts easy and more rewarding; (2) the absence of capable guardians (e.g., authority figures) reduces the possibility of social control responses to crime; and (3) the lack of structure in activities leaves time for criminal behavior. Findings from empirical research examining unstructured socializing and its effect on individual–level criminal behavior suggests that the relationship exists and is robust in nature (see Bernburg & Thorlindsson, 2001; Osgood & Anderson, 2004; Miller, 2013).

Routine activity theory is a theory of criminal offending and victimization. Studies show that routine activities increase the risk of being a victim of cybercrime (Holt & Bossler, 2008; Reyns, 2013; Reyns, Henson, & Fisher, 2011), fraud (Pratt, Holtfreter, & Reisig, 2010), and violent crime (Groff, 2007; Schwartz & Pitts, 1995, Schreck & Fisher, 2004). Nevertheless, routine activity theory provides little insight on the consequences of suffering criminal harm. From a GST perspective, criminal victimization is a key type of strain that is likely to promote criminal and deviant coping (see Hay & Evans, 2006; Hay & Meldrum, 2010; Reisig, Holtfreter, & Turanovic, 2018; Turanovic & Pratt, 2013). More specifically, studies have shown criminal victimization can lead to criminal offending (Jennings, Piquero & Reinge, 2012), violent delinquency (Moon, Morash, McCluskey & Hwang, 2009), property delinquency (Moon et al., 2009), and drug use (Carson Sullivan, Cochran & Lersch, 2008). Moreover, motivation is a key
factor in determining whether an individual responds to victimization in a criminal manner. A shortcoming of routine activity theory is that it fails to consider criminal motivation, often relying on other theories—such as GST—to fill the gap.

**Structural Strain Theory**

Structural strain theory was first introduced by Robert Merton (1938) to explain variation in aggregate level crime rates. Merton argues that cultural goals and blocked opportunities lead to anomie, especially among lower class populations. It is a common belief that citizens of the United States have a common goal of achieving materialistic well-being, but their methods of obtaining this goal are not the same due to differences in opportunity structures. Consequently, anomic conditions, a state where social norms lose power, arise when individuals do not possess the legitimate means to pursue cultural goals resulting in the use of alternative means, such as crime. For example, lack of adequate resources, such as the attainment of higher education or gainful employment, are barriers that ultimately affect one’s ability to accomplish financial goals. The disjunction between goals and means promotes anomie, thereby increasing the risk of criminal involvement.

A more recent version of structural strain was introduced by Messner and Rosenfeld (1994) in their book, *Crime and the American Dream*. Similar to Merton, institutional anomie theory was designed to explain crime rates in the United States. Messner and Rosenfeld argue that crime in America, for the most part, is the result of highly valued cultural and social conditions. More specifically, the goal of material success is highly valued in American culture, and individuals will succeed by any means necessary, even if that requires engaging in criminal behavior. Institutional anomie theory
is less concerned about why people engage in crime and more focused on why institutions lose their social control capacity. Messner and Rosenfeld contend that high crime rates are the result of institutional imbalance of power that ultimately weakens the social control functions of other non-economic social institutions (e.g., education). Once social control functions are weakened, individuals are free to engage in crime. Those who feel that they do not have equal access or are deprived of legitimate economic opportunities may rely on criminal behavior (e.g., theft, robbery, pimping, and pandering) to achieve the American Dream.

There are two major limitations of structural strain theory: (1) only one source of strain is identified, which is inability to achieve materialistic goals, and (2) the materialist fallacy, specifically assuming that everyone is motivated by material goods. Aware of the shortcomings of structural strain theories, Robert Agnew (1992, 2006) developed GST to address these two shortcomings and other limitations associated with structural strain theory. It is toward the task of more formally outlining GST that this chapter now turns.

**General Strain Theory**

The basic causal sequence of GST is as follows: experiencing strain causes one to feel negative emotions (e.g., anger, frustration, and depression), which in turn increases the likelihood of maladaptive coping (e.g., criminal offending). In other words, individuals are pressured into crime. There are three sources of strain: (1) the failure to achieve positive valued goals (e.g., not graduating from secondary school or receiving bad grades); (2) the removal of positive stimuli (e.g., death of a close family member or friend); and (3) the presentation of negative stimuli (e.g., criminal victimization). According to Agnew (2001), strains are most conducive to crime when they are seen as
unjust, high in magnitude, associated with low social control, and create pressure to engage in criminal coping. With regard to low social control, strong social bonds are important during the coping process because they can help alleviate some of the pressure that results from strain.

There are two types of strains: objective and subjective. Agnew (2001) describes objective strains as “events or conditions that are disliked by most members of a given group” (p. 320), while subjective strains pertain to events or conditions that are disliked by individuals who are experiencing or have experienced them. Most empirical research examining the strain-crime relationship focuses on objective strains, like victimization (see Agnew & White, 1992; Hay & Meldrum, 2012; Turanovic & Pratt, 2013). When it comes to crime, Froggio and Agnew (2007) found that subjective strains are more strongly associated with breaking the law than objective strains.

Strains can take on three forms: experienced, vicarious, or anticipated (Agnew, 2002). Experienced strain refers to personal experiences, like the presentation of negative stimuli (e.g., criminal victimization). The experienced strain hypothesis is the most tested component of GST (see, e.g., Agnew & Brezina, 1997; Agnew & White, 1992; Daniels & Holtfreter, 2018; Eitle, 2002; Ostrowsky & Messner, 2005; Piquero & Sealock, 2004). Vicarious strain refers to the witnessing or knowing of real life strains experienced by other people (e.g., family members, close friends, or neighbors; Broidy & Agnew, 1997). Strain experienced by an individual within a particular group or network can vicariously affect others within that network; this is especially true for networks where there is a high concern for the welfare of others. Lastly, anticipated strain occurs when there is an expectation for strain to continue and/or occur in the future. This type of strain is
typically associated with an individual’s negative outlook or expectations for the future. Comparatively little research has tested the effects of anticipated and vicarious strains (see Agnew, 2002; Baron, 2009; Eitle & Turner, 2002; Kort-Butler, 2010; Lin, Cochran, & Mieczkowski, 2011). Empirical tests of Agnew’s vicarious strain hypothesis tend to rely on vicarious victimization measures (e.g., asking respondents about victimization experienced by family, friends, and neighbors). Agnew’s vicarious strain argument has yet to be empirically evaluated using social network data. This is a significant limitation as it is well documented in literature that victimization is a key strain that frequently results in maladaptive behavior, and peers play a critical role in facilitating such behavior. The coping process is complex as there are many potential ways individuals may cope with experienced, anticipated, and vicarious strain.

Coping Responses

Agnew (2001) argues that negative affective states (e.g., anger, depression, and frustration) may arise in individuals who are faced with strains. The chances of delinquent outcomes increase when anger occurs as a response to strain. Agnew states that “crime may be a method for reducing strain (e.g., stealing the money you desire), seeking revenge, or alleviating negative emotions (e.g., through illicit drug use)” (p. 319). Coping is fundamental when handling strains and stressors. But not all reactions to strain and anger are deviant in nature. There are also behavioral, emotional, or cognitive coping responses to strain that do not involve breaking the law (Agnew, 2006). For example, some individuals may cope with strain by way of a support group (e.g., bereavement, alcoholics anonymous, or debtors anonymous), religion (e.g., attending church services
and praying), or extracurricular activities (e.g., involvement in sports or participation in social clubs).

There are certain internal and external influences that also promote criminal reactions to strain. The presence of certain internal factors can elevate the likelihood of delinquent responses when they interact with negative emotions. For example, self-esteem, social support, self-efficacy, self-control, and moral beliefs may act as moderators. External influences, such as affiliation with deviant peers, may also condition responses to strain (Agnew, 1992, 2006). For example, Mazerolle and Maahs (2000) argue that individuals who associate with delinquents are likely to model their behavior patterns, be exposed to their beliefs about deviance, and to receive support and reinforcement for delinquency. Finally, criminal outcomes are more common when individuals have a disposition towards delinquency; this includes individual-level characteristics such as low self-control, impulsivity, and antisocial personality tendencies, all of which have been shown to be related to crime and analogous acts (Gottfredson & Hirschi, 1990; Moffitt, 1993; Patterson, DeBaryshe, & Ramsey, 1989; Pratt & Cullen, 2000). Individuals with these particular personality traits are seen to be more physical, impulsive, and easily provoked, and according to GST, they are likely to engage in criminal coping. Although deviant peers can be conceptualized as a significant factor in responding to strain and dealing with negative emotions, the role of deviant peers has received minimal empirical scrutiny by researchers working in the GST tradition.

**Deviant Peer Affiliation and GST**

Deviant peer association is a robust predictor of criminal and deviant behavior. The risk of associating with deviant peers is influenced by internal and external factors.
Fergusson and Horwood (1999) found that social, family, parental, and individual factors are all predictors of deviant peer association. Furthermore, individuals who have low self-control (Chapple, 2005; McGloin & Shermer, 2009), are from low socioeconomic areas (Fergusson & Horwood, 1999; Lacourse, Nagin & Vitaro, 2006), raised in adverse family environments (Fergusson & Horwood, 1999), and those with conduct problems (Fergusson & Horwood, 1999) are at greater risk of engaging in deviant peer groups. This body of research implies that individuals may cope with life stressors (e.g., bad neighborhoods and abusive families) by associating with deviant peers. Moreover, deviant peer association potentially serves as a form of social support for individuals who experience strain. Deviant peer association has been argued to be a significant factor in the coping process in that it increases criminal and deviant responses to strain (see Mazerolle & Maahs, 2000). A significant amount of scholarship has been devoted to assessing the influence of peers in the involvement of crime and delinquency (Augustyn & McGloin, 2013; Barnes, Hoffman, Welte, Farrell, & Dintcheff, 2006; Fergusson, Swain-Campbell & Horwood, 2002; Haynie, 2002; Lacourse, Nagin, & Vitaro, 2006; Patterson & Dishion, 1985), gang activity (Frauenglass, Routh, Pantin, & Mason, 1997), alcohol use (Barnes et al., 2006), substance use (Agnew & White, 1992; Augustyn & McGloin, 2013; Barnes et al., 2006; Dishion et al., 1999; Fergusson et al., 2002; Frauenglass et al., 1997; Fujimoto, Unger, & Valente, 2012), and risky sexual behavior (Metzler, Noell, Biglan, Ary & Smolkowski, 1994). In short, there is a strong positive relationship between deviant peers association and criminal and deviant outcomes. While that is the case, there has been little empirical testing of the moderating effect of deviant peers on the strain and delinquency relationship, specifically examining if deviant peers
increase the effect of strain on negative emotions, and if deviant peers moderate the effect of negative emotions on crime. Therefore, the current dissertation seeks to fill this void in literature by assessing this relationship using various strains, specifically teenage pregnancy, low social support, and vicarious victimization. In the following section, each study is introduced.

**Three Empirical Studies**

GST suggests that strain causes individuals to experience negative emotions, which in turn increases the likelihood of criminal coping. Agnew (1992, 2006) argues that strains are likely to result in crime when they are viewed as unjust, high in magnitude, associated with low social control, and create some pressure or incentive to cope in a criminal manner. In addition, he asserts that criminal victimization is a key strain that fosters criminal coping as it satisfies the criteria previously mentioned. Individuals who experience such strain may respond in a maladaptive manner, especially when they have deviant peer affiliates. Deviant peers have been found to influence a host of negative outcomes (e.g., substance abuse and delinquency; Toro et al., 2004; Vitaro, Brendgen, & Tremblay, 2000). Although deviant peer association is a robust predictor of crime, its role in the coping process is underdeveloped in strain literature. In other words, there has been significant amount of scholarship examining the effects of peer deviance on crime and the effects of strain and negative emotions on crime (and other maladaptive behaviors), but not much energy has been devoted to integrating these factors.

The purpose of this dissertation is to incorporate the role of peers into the GST tradition. More specifically, this research investigates whether deviant peers moderates the relationship between strain and negative well-being outcomes. This dissertation
includes three empirical studies. The first study examines the relationship between teenage pregnancy (strain), negative emotions and maladaptive behaviors. Specifically this study investigates whether deviant peer association moderates the relationship between teenage pregnancy and negative emotions. It will also test whether deviant peers condition the link between negative emotions and maladaptive behaviors. The second study uses network data to test the vicarious strain hypothesis. More specifically, this study tests whether the victimization of a friend increases personal involvement in criminal offending. In addition, this study examines whether the effect of peer victimization on personal coping depends on peer deviance. The third study examines the relationship between low social support support (strain) and maladaptive behavior. The main research question of this study is whether deviant peer association moderates the relationship between low social support and maladaptive behavior. The following sections provide a more in-depth discussion of each study.

Study 1. Teenage Pregnancy, Negative Emotionality, and Maladaptive Coping: An Examination of the Interaction Effect of Peer Deviance

Teenage pregnancy is a serious social problem. Although the teenage pregnancy rate has declined overtime, the United States is still ranked highest among industrialized nations (Sedgh et al., 2015). A large body of literature has examined the risk factors associated with teenage pregnancy, suggesting that deviant peer association (Woodward & Fergusson, 1999), early conduct problems (Woodward, Fergusson, & Horwood, 2001), low attachment and performance in school (Bonell et al., 2003), and residing in socially disorganized neighborhoods and poverty (Bonell et al., 2003; Harding, 2003) are all factors that increase the risk of teenage pregnancy. With regards to pregnancy outcomes,
motherhood has been found to promote desistance as it is negatively related to delinquent and other criminal behavior (see Kreager, Matsueda, & Erosheva, 2010; Pyrooz, McGloin, & Decker, 2017; Walker & Holtfreter, 2016). Although this work is certainly helpful, two important questions remain. First, while scholars have focused heavily on the causes of teenage pregnancy, little research has considered the consequences, such as negative emotionality and maladaptive coping (e.g., property crime and substance use). Second, limited attention has been paid to factors that moderate the relationship between teenage pregnancy and outcome variables. More specifically, the moderating impact of deviant peers in promoting negative outcomes remains largely uninvestigated.

This study uses data from the National Longitudinal Survey of Adolescent to Adult Health (Add Health), specifically waves I and II. The Add Health study is an ongoing and longitudinal project of a nationally representative, school-based sample of approximately 20,000 adolescents in the United States who were in grades 7 through 12 between September 1994 and December 1995. Recruitment efforts yielded a total of 132 schools for the core study, 80 of which were high schools and 52 were middle schools (see Harris, 2009). Students attending the participating schools were able to take part in an in-school questionnaire, in-home survey, and in-home interview. Information obtained from these three sources of data includes, but is not limited to, the respondent’s social and demographic characteristics, education and occupation of parents, household structure, risky behaviors, criminal activities, substance use, sexual history, employment history, health status, and self-esteem. From a school roster, students were also asked to nominate five male and five female friends to create an approximate census of school social network. Wave II data collection, consisting of 15,000 students who participated in
wave I, was conducted between April and August of 1996, a one year follow-up to the initial data collection process. Here, data collection included in-home interviews with young adults and follow-up school administrator interviews. The questions between the first two waves were consistent.

There are various measures used to capture maladaptive behavior. Some key dependent variables of interest include: alcohol problems, marijuana use, and hard drug use. The main independent variables of interest in this study are teenage pregnancy (strain), depression (negative emotions), and deviant peer association (moderator). A series of multivariate negative binomial regression models and binary logistic regression models will be estimated to test the relationships of interest.

The findings from this study may assist health practitioners and researchers to become more aware of the mental health and social needs of females who become pregnant as teenagers. Early intervention may potentially buffer against criminal and deviant behavior. In terms of theory, deviant peer association is an important variable to consider in future test of GST as it provides insight on the pathways to delinquency for those who experience strain.

**Study 2. Vicarious Victimization, Negative Emotions, and Maladaptive Coping: Investigating the Moderating Effect of Deviant Peers**

Criminal victimization is one of the most severe types of strain (Agnew, 2001). There are a host of negative outcomes that result from violent victimization, such as delinquency (Agnew, 2002; Chang, Chen, & Brownson, 2003; Hay & Evans, 2006; Manasse & Ganem, 2009), depression (Barchia & Bussey, 2010; Manasse & Ganem, 2009), academic maladjustment, peer rejection, and being viewed as physically weak
(Card & Hodges, 2008). Arguably, victimization may cause one to seek out deviant friends. More specifically, those who are victimized may adopt deviant peers as a way to cope with victimization, and as a form of protection from future acts of victimization. To date, however, little scholarly attention has examined the effect of vicarious victimization on maladaptive behavior, such as violent/property crime and drug use (see Lin et al., 2011). This study investigates the moderating impact of deviant peers.

Most existing studies testing GST have explored the relationship between experienced strain and negative outcomes (both negative emotions and criminal coping), while minimal scholarly attention has been devoted to examining the role of anticipated or vicarious strain on negative outcomes (Agnew, 2006). The few studies examining the vicarious strain hypothesis found support (Agnew, 2002; Baron, 2009; Kurt-Butler, 2010; Lin et al., 2011). However, existing studies rely exclusively on indirect vicarious strain measures, such as using respondents’ reports of victimization within their network of friends and whether they have personally witnessed violence. To date, social network data has not been used to study the impact of vicarious strain on criminal behavior. Using network data to examine Agnew’s vicarious strain hypothesis will be beneficial for two primary reasons. First, it provides a more direct measure of the actual victimization experienced by one’s friends, versus relying on self-report data. Second, by examining an individual’s network structure may provide clues as to why they respond to strain in a particular manner.

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2 Gottfredson and Hirschi (1987) argue that the only way respondents could adequately know and report on their friends’ delinquency is by: (1) their joint involvement in the delinquent acts, (2) the imputation of their personal behavior to their friends, (3) the imitation of friendship to people like themselves, or (4) by “hearsay.”
The dearth of strain-oriented research using social network data may be due to data limitations and/or lack of theoretical clarity. Broidy and Agnew (1997) describe vicarious strain as the real life strain experienced by those around the individual, particularly close family members, friends, and even neighbors. People may directly witness the strain experienced by others (e.g., robbery or assault), may hear others experiencing strain (e.g., screaming or crying), or they may hear about the strain of others from a secondary source (e.g., from victims, witnesses, or news stories; Agnew, 2002). This broad description of vicarious strain does not differentiate the impact of strain based on relationship or closeness of a person and strained individual. Arguably vicarious strain will have a stronger impact on someone when there is some personal connection or relationship. Therefore, using network data from Add Health, this study will employ structural equation modeling to examine how the victimization of one’s friends can influence personal involvement in maladaptive behaviors. More specifically, the research questions that this study seeks to address include: (1) Does victimization of one’s friends increases personal involvement in maladaptive behavior? (2) Do deviant peers moderate the relationship between peer victimization and maladaptive behavior?

In this study, the key variables of interest include: peer victimization (vicarious strain), deviant peer association (moderator), and violent offending (maladaptive coping). Findings from this study may provide additional context for the cycle of violence. Given that violence can be cyclical, school officials, criminal justice agents, and health care providers should be aware of the effects of vicarious violent victimization as it potentially impacts the lives of those who are connected to the victimized individual. This study also serves as a demonstration regarding the utility of network data. Studies testing the
vicarious strain hypothesis should consider using network data, as it provides an improved measure of vicarious strain.

*Study 3. Low Social Support and Crime: The Conditioning Impact of Deviant Peers*

Over the past couple of decades, interest in the link between social support (or lack thereof) and criminal behavior has increased (Colvin, Cullen, & Ven, 2002; Cullen, 1994). Social support refers to tasks performed for individuals by people within their network, such as romantic partners, family members, friends, and coworkers, in an attempt to reduce stress (Thoits, 1995). Social support is hypothesized to buffer individuals from becoming involved in criminal behavior (Robbers, 2004).

GST focuses on negative relationships with others, specifically relationships where others do not treat the individual as he or she desires (Agnew, 1992). GST posits that there are three sources of strain. Through the lens of GST, insufficient social support may then be conceptualized as a strain as it reflects the removal of positive stimuli. When social support is low, individuals may be at an increased risk of experiencing negative emotions, and in turn engage in antisocial behavior.

Low social support has received minimal empirical attention by GST researchers. This represents a major gap in research as low social support may promote conditions where associations with deviant peers are more likely to take root and develop. Hawkins and Weis’s (1985) social development model, an integration of social control theory and social learning theory, contends that behavior is influenced by positive socialization with family, schools, peers, and community. Decreased attachments in positive relationships with prosocial agents (e.g., parents and teachers) lead to an increase in associating with deviant peers, consequently undermining prosocial behavior. This implies that bonds to
conventional society serve as a protective factor from associating with deviant peers, thus preventing deviant behavior. There is ample literature investigating social support on a variety of outcomes ultimately suggesting that social support is a buffer to major stressors. In other words, there is a negative relationship between social support and criminal behavior. Less is known on the absence of or low social support.

Using Add Health data, this study investigates the conditioning effect of deviant peer affiliation on the relationship between low social support and crime. The key variables in this study include: maladaptive coping (operationalized as delinquency), low social support (strain), and deviant peer association (moderator). Low social support is measured using Wight and colleagues (2006) 7-item validated scale (e.g., “that adults care about you” and “your teachers care about you”).

Findings from this study will prove useful to policymakers and practitioners by demonstrating that providing adequate social support to youth buffers against criminal behavior. Moreover, with regards to theory testing, supportive results would indicate that low social support should be investigated as a strain in future tests of GST.

**Organization of Dissertation**

The remainder of this dissertation is organized as follows: Chapter Two (study 1) focuses on the relationship between teenage pregnancy, negative emotions, and maladaptive behavior. The primary interest is on the moderating role of deviant peer groups. Does one’s association with deviant peers moderate the link between teenage pregnancy and negative emotions? Do deviant peers impact the connection between negative emotions and substance use behaviors? Chapter Three (study 2) examines the vicarious strain hypothesis, especially its effects on violent offending. This chapter uses a
direct measure of victimization of peers to operationalize vicarious strain to gain a better understanding of how the victimization of one’s friends affect personal behavior, which emphasis on the potential moderating role of deviant peers. Chapter Four (study 3) focuses on the relationship between low social support and crime. It is well-known that social support serves as a buffer to criminal and deviant behavior. Although that is the case, low social support may be a strain that provokes a criminal or deviant response. Arguably, individuals may cope with low social support by associating with deviant peers, which may increase the risk of criminal coping. Finally, Chapter Five discusses the theoretical, empirical, and practical implications of these three studies.
References


CHAPTER 2
TEENAGE PREGNANCY, NEGATIVE EMOTIONALITY, AND MALADAPTIVE COPING: AN EXAMINATION OF THE INTERACTION EFFECT OF PEER DEVIANCE

Introduction

Teenage pregnancy is undoubtedly a social ill that significantly impacts society. While the rate of teen pregnancy has declined in recent decades, it remains high in the United States, relative to other developed countries (McDonnell et al., 2007). According to data from the Centers for Disease Control and Prevention (CDC), in 2014 the birth rate was 24.2 per 1,000 females aged 15-19, representing a 9 percent decline from 2013 (Hamilton et al., 2015). In 2014, a total of 249,078 babies were born to women aged 15-19 in the U.S. Despite the fact that there are a significant amount of children born to teenage mothers, it is important to note that not all pregnancies end in a live birth. Data suggest that nearly 40 percent of all unplanned pregnancies are terminated (Finer & Zolna, 2016). With regard to adolescent pregnancies, the 2011 teenage pregnancy rate was 53.3 per 1,000 women under the age of 20, translating to approximately 562,000 pregnancies that year (Kost & Maddow-Zimet, 2016).

There are a variety of negative consequences associated with unplanned teen pregnancies. The economic impact of teenage pregnancy is significant. Data from the National Campaign to Prevent Teen and Unplanned Pregnancy show that teenage pregnancy and childbearing cost American taxpayers nearly $9.4 billion in 2010 alone (Shugar, 2012). Research has shown that teenage mothers are typically undereducated, and their children tend to underperform in school and exhibit a substantial amount of
problem behaviors (Letourneau, Stewart, & Barnfather, 2004). Furthermore, young mothers are more likely to live in poverty and rely on public assistance (Borkowski et al., 2016). While the economic and societal costs of teen pregnancy are well documented, less is known about the ways teens themselves cope with the strains of pregnancy.

Teen pregnancy clearly fits the definition of a life stressor, or strain. According to Agnew’s (1992) general strain theory (GST), strains and stressors increase negative emotions (e.g., anger, depression and frustration), and, in turn, maladaptive coping (e.g., crime). A main assumption of GST is that individuals are “pressured” into crime (see Agnew, 2006). Past research exploring the relationship between teenage pregnancy and delinquency revealed that those who become pregnant during adolescence have higher levels of involvement in delinquency than never pregnant teenagers (see Hope, Wilder, & Watt, 2003). However, one limitation of previous studies is the use of a general delinquency measure as the primary dependent variable, resulting in a failure to examine involvement in specific maladaptive coping behaviors, such as substance use. Also, past research has not thoroughly investigated the role of negative emotionality or the conditioning impact that deviant peers may have in explaining the links between teen pregnancy and delinquency. There is a robust relationship between deviant peers and deviant behavior (Hoeben, Meldrum, Walker, & Young, 2016). More specifically, Hoeben and colleagues’ (2016) review suggests that deviant peers are significantly related to delinquent and substance use behaviors. Individuals who associate with deviant peers are likely to become involved in crime and delinquency (Fergusson, Swain-Cambell, & Horwood, 2002; Haynie, 2002) and substance use (Fergusson et al., 2002).
Less is known about the effect of deviant peers in the coping process, specifically whether deviant peers moderate the relationship between strain and maladaptive coping.

In sum, there are gaps in the literature on teenage pregnancy and maladaptive coping. Scholars have focused heavily on the causes of teenage pregnancy and less on the consequences, such as negative emotionality and maladaptive coping. Additionally, the role of deviant peers in facilitating offending behavior among those who experience strain has remained unexplored. Using data from the National Longitudinal Study of Adolescent to Adult Health (Add Health), the current study relies on GST to address this void by investigating the relationship between teenage pregnancy and maladaptive coping. Drawing from Agnew’s (1992, 2006) theoretical framework, it is anticipated that teenage pregnancy will contribute to depression and create pressure for corrective action, in the form of substance use, deviant peers will moderate the relationship between teenage pregnancy and maladaptive outcomes, and those who experience teenage pregnancy, depression, and associate with deviant peers will be more likely to engage in substance use behaviors.

**Literature Review**

*Risks of Teenage Pregnancy*

Despite the reduction in teenage childbearing rates, teenage pregnancy remains a significant social and public health concern capturing the attention of academics, policy makers, and the public. Compared to other developed nations, the teenage pregnancy rate in the U.S. remains considerably higher (McDonell et al., 2007; Sheftall et al., 2010). Accordingly, scholars have long been interested in teenage pregnancy, and have
identified a variety of biological, individual, and situational risk factors associated with increased likelihood of teen pregnancy.

Findings from previous research suggest that the risk of teenage pregnancy is influenced by biological factors. For example, predictors of initiation of sexual intercourse, such as pubertal timing, hormone levels, and genes have been associated with increased risk of teenage pregnancy (see Miller, Benson, & Galbraith, 2001; Scaramella, Conger, Simons, & Whitbeck, 1998; Woodward & Fergusson, 2001). These biological factors have also been shown to be correlated with early sexual intercourse, increasing the possibility of females becoming pregnant as a teen. Although there are biological influences that contribute to the social problem, the risk of teenage pregnancy is also influenced by various individual and situational factors.

Research shows that susceptibility to teenage pregnancy is heavily influenced by personal and situational context. For example, studies have found that associating with deviant peers (Woodward & Fergusson, 1999), early conduct problems (Woodward, Fergusson, & Horwood, 2001), substance use (Connery, Albright, & Rodolico, 2014), depression (Hall, Richards, & Harris, 2017), low attachment and performance in school (Bonell et al., 2003), low level of literacy (Bennett et al., 2013), residing in socially disorganized neighborhoods and poverty (Harding, 2003; Miller, 2002), having older sexually active siblings or parent/parenting teenage sisters (East & Jacobson, 2001), father’s absence (Ellis et al., 2003), being born into a single parent family (Woodward & Fergusson, 1999), exposure to sexual content on television (Chandra et al., 2008), history of abuse (Garwood, Gerassi, Jonson-Reid, Plax, & Drake, 2015; Roosa, Tein, Reinholtz,
& Angelini, 1997), and childhood exposure to sexual abuse (Woodward & Fergusson, 1999) are all situational factors that increase the risk of teenage pregnancy.

Research has also revealed that abusive relationships increase the risk of teenage pregnancy (see Garwood et al., 2015; Roosa et al., 1997). More specifically, Roosa and associates’ study examining the relationship between childhood sexual abuse and teenage pregnancy showed that sexual abuse by a boyfriend was a significant predictor of teenage pregnancy. Moreover, Garwood and colleagues used a sample of children from impoverished neighborhoods to examine the effect of child maltreatment (i.e., abuse and neglect) on teenage pregnancy risk. Their results demonstrated that child maltreatment increased the risk of teenage pregnancy even after controlling for neighborhood disadvantage.

Family context has also been found to impact involvement in sexual activity. Residing in a single parent-household is another predictor of early sexual activity and teenage pregnancy. Specifically, growing up in a fatherless household can be detrimental for young females. Ellis and associates (2003) used longitudinal data on girls from the United States and New Zealand to explore the relationship between father absence and risk for early sexual activity and teenage pregnancy. After controlling for relevant covariates, they found that father absence exerted a strong and significant effect on early sexual activity and teenage pregnancy, regardless of behavior and mental health problems or academic achievement. This shows that having a father in the household who is actively taking part in the childrearing process may reduce the risk of teen pregnancy. In two-parent households, there arguably may be higher levels of social support and social control than in single-parent households. Effective parenting is important in reducing the
risk of teenage pregnancy. East and colleagues (2006) studied risk and protective factors for adolescent pregnancy. Their results indicated that parental involvement and strictness during early adolescence safeguarded against early pregnancy. While family context is influential on pregnancy during adolescence, academic performance also plays a role.

School interest and involvement have been argued to have an effect on teenage pregnancy. Prior research shows that low attachment and performance in school increases the risk of early pregnancy. Bonell and colleagues (2005) found that dislike of school was significantly associated with risk of pregnancy. Similarly, low levels of literacy in the pre-teen years increased the risk of pregnancy. Bennett et al. (2013) used a sample of girls from Philadelphia to assess the relationship between pre-teen literacy and subsequent teenage childbearing. They found that literacy, specifically less than average reading skills, strongly predicted teenage childbearing. This suggests that education may serve as a buffer against teenage pregnancy.

To sum up, there are several documented risk factors for teenage pregnancy. Such factors can be categorized as either biological, individual, or situational. Research shows that pubertal development, depression, early conduct problems, low school attachment and commitment, living in low socially disorganized neighborhoods, being exposed to sexually active others, and/or having negative and abusive relationships are factors predicted to increase the risk of teenage pregnancy. A significant amount of research investigating teenage pregnancy focuses on its causes. However, just as there are risk factors of teenage pregnancy, there are also consequences. That said, the next section provides a brief overview of the consequences of teenage pregnancy.
Consequences of Teenage Pregnancy

A variety of potentially severe consequences of teenage pregnancy have been documented. For example, pregnant adolescents are at risk for being stigmatized, experiencing social isolation and abuse, and having their educational journey truncated (see Weimann, Rickert, Berenson, & Volk, 2005). Females who become pregnant as teens may be stigmatized by family, peers, and teachers, thus leading to increased levels of social isolation and peer rejection. Indeed, it is important to acknowledge that there are potential collateral consequences of stigmatization. Individuals may become hesitant, or even discouraged by prosocial others, to associate with individuals who are stigmatized by early pregnancy. Weimann and associates (2005) found that the majority of females who became pregnant as an adolescent reported feeling stigmatized. In addition, they were at an increased risk for social isolation and abuse. While teenage pregnancy increases stigmatization, it also has the potential for hindering an individual’s educational attainment.

The educational journey of teenage females may be thwarted as a result of pregnancy. According to data from the National Campaign to Prevent Teen and Unplanned Pregnancy, nearly one-third of teenage girls who dropped out of high school cite pregnancy or parenthood as a primary reason (Shuger, 2012). Dropping out of high school could be detrimental as it potentially limits young women’s access to prosocial others, as well as their ability to obtain adequate employment in the future. Given these negative consequences of teenage pregnancy, it is clear that teenage pregnancy is a major life event and potential turning point that leads to stress and strain in the lives of adolescents. Although numerous studies have highlighted the risks and consequences of
teenage pregnancy, they have not been well organized around a theoretical framework to provide information on how and why such relationships exist. GST sheds light on the relationship between teenage pregnancy and negative outcomes. The next section discusses teenage pregnancy within the GST context.

*Teenage Pregnancy as a Strain*

Teen pregnancy may operate as strain in lives of young women. Studies that have examined consequences of teenage pregnancy have found it to be associated with stigmatization, social isolation, truncated education, and subsequent abuse. Past research is limited as it fails to investigate involvement maladaptive behaviors (e.g., substance use). Agnew’s GST provides a theoretical framework for why females who become pregnant as teens may engage in maladaptive coping.

According to Agnew (1992), strain and stress causes one to develop negative emotional states (e.g., anger, frustration, and depression). Ultimately, these negative emotions foster maladaptive coping (i.e., criminal and deviant behavior). Agnew argues that there are three sources of strain: (1) the failure to achieve positively valued goals, (2) the removal of positive stimuli, and (3) the presentation of negative stimuli. In addition, strains argued to foster a criminal response are those that are seen as unjust, high in magnitude, associated with low social control, and create pressure or incentive to cope in a criminal manner (Agnew, 2001). Based on empirical research examining the causes and consequences of teenage pregnancy, it is logical to conclude that these sources of strain are prominent in the lives of females who become pregnant during their teenage years. For example, teenage pregnancy may hinder one’s ability to achieve positively valued goals, such as not graduating from secondary school or receiving bad grades. Findings
from prior empirical research investigating the consequences of teenage pregnancy show that a significant amount (approximately 30 percent) of females who dropout of high school report teenage pregnancy or parenthood as a key reason. Teenage pregnancy thus serves as a barrier in one’s effort to achieve positively valued goals in the form of obtaining an education.

Girls who become pregnant during their teenage years may experience the removal of positive stimuli, in the form of diminished relationships with friends or close family members. As previously mentioned, teenage pregnancy may result in stigmatization from family, peers, and others (e.g., teachers). As a result, relational ties may be damaged, forcing pregnant teens to associate with deviant peers (e.g., through rejection by prosocial peers or limited access to prosocial peers due to dropping out of high school). Similarly, due to stigma and fear, parents may be reluctant to let their children associate with pregnant peers. The adoption of deviant peers leads to additional negative consequences given that deviant peer association is a robust predictor of delinquency and substance use (see Fergusson, Swain-Campbell, & Horwood, 2002; Hoeben et al., 2016).

The final source of strain, the presentation of negative stimuli, is also apparent in the lives of those who become pregnant as teens. Some common examples of negative stimuli are abuse and victimization (see Agnew, 2006). Prior research documents that females who become pregnant during their teen years are subjected to abuse (Weimann et al., 2005). Furthermore, research shows that sexual abuse and childhood maltreatment is a precursor of teenage pregnancy (see Garwood et al., 2015; Roosa et al., 1997). In sum,
consistent with GST, those who experience teenage pregnancy are subjected to the presentation of negative stimuli.

Teenage pregnancy produces several barriers. These barriers may operate as strains and stressors in the lives of young women as they are more likely to fail to achieve positively valued goals, are presented with negative stimuli, and have positive stimuli removed. Agnew (1992) argues that those who experience strain are likely to develop negative emotions, which ultimately increases their risk of maladaptive coping in the form of crime and deviance. These findings demonstrate the importance of the need to empirically investigate the relationship between teenage pregnancy and maladaptive coping. Moreover, it is also critical to explore the role of peers in teenage pregnancy.

Deviant Peers, Crime, and Delinquency

A known fact in criminology is that deviant peer association is a key predictor of criminal and deviant behavior. Empirical research has linked deviant peer affiliations to an increase involvement in a host of negative outcomes, such as crime and delinquency (Fergusson et al., 2002), alcohol use (Barnes et al., 2006), substance use (Dishion & Loeber, 1985; Simons-Morton et al., 2001), and risky sexual behavior (French & Dishion, 2003; Miller, 2002). While deviant peers are responsible for facilitating criminal and deviant behavior, less is known about the moderating effect of deviant peers on the strain and delinquency relationship. More specifically, there is a lack of research assessing if deviant peers increase the effect of strain on negative emotions, and if deviant peers elevate the effect of negative emotions on crime. For example, individuals who experience strain, negative emotions, and associate with deviant peers may be more likely to cope with strain in a maladaptive manner. Arguably, individuals who experience
strain may depend on deviant peers as a form of social support, consequently increasing their involvement in criminal and deviant behavior. Regarding teenage pregnancy, females who become pregnant as teens are at risk of dropping out of high school and facing social isolation. These consequences potentially limit access to prosocial others forcing individuals to associate with deviant individuals.

*Teenage Pregnancy and Offending*

To date, very few studies have examined the relationship between teenage pregnancy and offending. In one exception, Hope et al. (2003) assessed the relationship between adolescent pregnancy, pregnancy resolution, and juvenile delinquency. They found that those who reported a pregnancy were significantly more likely to engage in delinquency than their “never pregnant” counterparts. While there was a strong and significant relationship between teenage pregnancy and delinquency, a limitation of this research is the use of a general delinquency measure, preventing any investigation of the relationship between teenage pregnancy and individual maladaptive behaviors, such as drug use and alcohol problems. In addition, the Hope et al. study included females who were older than the age of 18 to predict delinquency. Some of the behaviors in their scale included running away from home and smoking cigarettes. Walker and Holtfreter (2016) built on prior research by examining the relationship between adolescent motherhood and delinquency. Contrary to the theoretical expectations advanced by GST, they found that adolescent motherhood was negatively associated with delinquency, even after controlling for known correlates of crime. Their study suggests that having a child as an adolescent served as a protective factor against engaging in delinquency, which they attributed at least in part to restricted opportunity. Thomas and Petrovic’s (2011) study
investigating changes in illicit drug use for women found that having children was associated with an increase in illicit use. While these studies have contributed to scholarship on teenage pregnancy and childbearing, they are limited in three important ways: (1) the use of a general measure of delinquency; (2) a focus on offending as the sole maladaptive coping outcome; and (3) the potential moderating role of delinquent peers was not considered. As a result, there is still more to learn about the ways in which teens cope with the stress of pregnancy.

**Current Focus**

This study uses data from the National Longitudinal Survey of Adolescent to Adult Health (Add Health) to assess whether becoming pregnant as a teenager influences negative coping, in the form of alcohol problems, marijuana use, and illicit drug use. The analyses will address the following questions: (1) Are females who become pregnant as teens more likely to experience depression? (2) Are those who experience teenage pregnancy and associate with deviant peers at increased risk of experiencing depression? (3) Does teenage pregnancy increase involvement in substance use behaviors (i.e., alcohol problems, marijuana use, and hard drug use)? (4) Does depression mediate the relationship between teenage pregnancy and substance use behaviors? (5) Do deviant peers moderate the relationship between teenage pregnancy and substance use behaviors? And finally, (6) Are individuals who experience teenage pregnancy, associate with deviant peers, and experience symptoms of depression more likely to cope in a maladaptive manner?
Data and Methods

The current study uses data from Waves I and II of the National Longitudinal Study of Adolescent to Adult Health (Add Health). Add Health is a nationally representative, school-based sample of approximately 20,000 adolescents in the United States who were in grades 7 through 12 between September 1994 and December 1995. The initial sampling frame consisted of 26,666 schools which were stratified by level of urbanization, school type, school size, ethnicity, and census region. Participating high schools were requested to identify feeder schools (also referred to as middle schools), which are schools that included a 7th grade and sent a minimum of five students to that particular high school. The top feeder school for each high school was selected for participation in the study. If the feeder school declined to participate in the study, a replacement school was selected. Recruitment efforts yielded a total of 132 schools for the core study, 80 of which were high schools and 52 were middle schools. Students attending the participating schools were eligible to take part in an in-school questionnaire, in-home survey, and an in-home interview. Information obtained from these three sources of data includes, but is not limited to, the respondent’s social and demographic characteristics, education and occupation of parents, household structure, risky behaviors, criminal activities, substance use, sexual history, employment history, health status, and self-esteem.

In addition to baseline measures at wave I, behavioral measures from wave II were used to investigate the relationship between teenage pregnancy and substance use involvement. Wave II data collection was conducted in 1996 consisting of follow-up in-home interviews with young adults and follow-up school administrator interview. There
were nearly 15,000 adolescents surveyed in Wave I who were also surveyed in Wave II. Because the main focus is on adolescents and teenage pregnancy, the sample was limited to those participants aged 17 years and younger. After excluding cases of respondents who identified as males, and cases where there were missing data, the final sample size is 5,236 female respondents.

**Dependent Variables**

The three dependent variables are from wave II of the in-home survey. Following previous research (Turanovic, 2015), *alcohol problems* were assessed using a 7-item summated scale asking respondents to report how often during the past 12 months: “you got into trouble with your parents because you had been drinking”, “you had problems at school or with school work because you had been drinking”, “you had problems with your friends because you had been drinking”, “you had problems with someone you were dating because you had been drinking”, “you did something you later regretted because you had been drinking”, “you were hungover”, and “you were sick your stomach or threw up after drinking.” Items were coded as 0 = never, 1 = once, 2 = twice, 3 = three of four time, and 4 = five or more times. The items were then summed to create the alcohol problems scale (mean = 1.08, SD = 2.58). The scale shows a good level of internal consistency (α = 0.81).

During wave II data collection, *marijuana use* was assessed using a single item that asked respondents during the past 30 days, “how many times have you used marijuana?” The item was originally coded as a count variable (M = 1.09, SD = 5.14), with the majority of respondents reporting no marijuana use. Accordingly, to capture any
marijuana use, the item was coded dichotomously (1 = yes, 0 = no). Approximately 14 percent (n = 746) of respondents reported using marijuana in the past 30 days.

Like marijuana use, *hard drug use* was originally a count variable (M = 0.16, SD = 2.46). Respondents were asked during the past 30 days how many times they used illicit drugs (e.g., crack cocaine, cocaine, glue or solvents, inhalants, LSD, PCP, and ecstasy). The item was coded dichotomously (1 = yes, 0 = no). The coding strategies for both substance use measures are consistent with prior research (see Turanovic, 2015).

**Independent Variables**

*Teenage pregnancy* was captured by asking respondents “have you ever been pregnant?” Data for the teenage pregnancy variable was taken from waves I (42% or n = 111) and II (58% or n = 154) of data collection (n = 265). The pregnancy measure was combined into a single item for respondents reporting a pregnancy at either wave I or wave II of data collection (1 = yes, 0 = no).

Studies show that teenage pregnancy (Hall et al., 2017) and childbearing is associated with depression (Mollborn & Morningstar, 2009; Whitworth, 2016). Depression was operationalized as a 16-item summated scale consisting of measures adapted from the CES-D (Radloff, 1977). Specifically, participants were asked during the past seven days how often: (1) “you were bothered by things that usually don’t bother you”; (2) “you didn’t feel like eating, or your appetite was poor”; (3) “you felt that you could not shake off the blues, even with help from your family and your friends”; (4) “you felt that you were just as good as other people”; (5) “you had trouble keeping your mind on what you were doing”; (6) “you felt depressed”; (7) “you felt hopeful about the future”; (8) “you thought your life had been a failure”; (9) “you felt fearful”; (10) “you
were happy”; (11) “you talked less than usual”; (12) “you felt lonely”; (13) “people were unfriendly to you”; (14) “you enjoyed life”; (15) “you felt sad”; and (16) “you felt that people disliked you.” Responses to each question ranged from 0 (never or rarely) to 3 (most of time or all of the time). Items 4, 7, 10, and 14 were recoded so that higher values indicated greater levels of depression. A summated scale using the 16-items was constructed where higher values reflect greater levels of depression ($\alpha = 0.86$).

**Moderating Variable**

*Deviant peer association* is a 3-item additive scale using information from wave II. Respondents were asked of your three best friends, how many “smoke at least one cigarette a day”, “drink alcohol at least once a month”, and “use marijuana at least once a month” (0 = no friends, 1 = one friend, 2 = two friends, 3 = three friends). The items were averaged with greater values indicating higher levels of association with deviant peers ($\alpha = 0.77$). This coding strategy is consistent with prior research (Tillyer & Tillyer, 2016).

**Control Variables**

*Low self-control* is a 6-item summated scale using data from wave 1 (see McGloin & Shermer, 2009). Respondents were asked, during the past week (1) “when you have a problem to solve, one of the first things you do is get as many facts about the problem as possible,” (2) “when you are attempting to find a solution to a problem, you usually try to think of as many different ways to approach the problem as possible,” (3) “when making decisions, you generally use a systematic method for judging comparing alternatives,” and (4) “after carrying out a solution to a problem, you usually try to analyze what went right and what went wrong” (1 = strongly agree, 2 = agree, 3 = neither agree nor disagree, 4 = disagree, 5 = strongly disagree). The last two items asked
respondents during “getting your homework done” (0 = never to 4 everyday), and “paying attention in school” (0 = never to 4 = everyday). Being that the response sets varied between questions, the items were standardized prior to creating a summated scale, with higher values reflecting lower levels of self-control (α = 0.70).

*Low self-esteem* is assessed using 6-items from Rosenberg’s (1965) low self-esteem scale. Respondents were asked how much did they agreed with the following statements: “you have a lot of good qualities,” “you have a lot to be proud of,” “you like yourself the way that you are,” “you feel like you are doing everything just about right,” “you feel socially accepted,” and “you feel loved and wanted.” Participants responded to the statements using a 5-point scale: strongly agree (1), agree (2), neither agree nor disagree (3), disagree (4), and strongly disagree (5). The items were then summed to create a low self-esteem index (α = 0.86).

Consistent with prior research (Wight, Botticello, & Aneshensel, 2006), *social support* was measured using a 7-item index asking respondents how much respondents felt “that adults care about you,” “your teachers care about you,” “your parents care about you,” “your friends care about you,” “people in your family understand you,” “your family pays attention to you,” and “you and your family have fun together” (0 = not at all, 1 = very little, 2 = somewhat, 3 = quite a bit, and 4 = very much). The items were summed, so that higher values indicate greater levels of social support (α = 0.78).

Similar to Demuth and Brown (2004), *parental attachment* was operationalized using 4-items from wave II that asked respondents about their relationships with their mother and father. More specifically, respondents were asked how much did they agree with the following statements: “Most of the time, {mom/dad} is warm and loving
towards you,” “you are satisfied with the way {mom/dad} and you communicate with each other,” “Overall, you are satisfied with your relationship with {mom/dad},” and “how close do you feel to {mom/dad}.” The first three items were coded as strongly agree (1), agree (2), neither agree nor disagree (3), disagree (4), and strongly disagree (5), while the latter was coded as not close at all (1), not very close (2), somewhat close (3), quite close (4), extremely close (5). The first three items were recoded so that the higher values indicated greater levels of parental attachment. For adolescents residing in two-parent households, the higher score between maternal and paternal attachment was used to indicate parental attachment (α = 0.87).

Low school attachment was assessed using a 3-item index adopted from McGloin and Shermer (2009). On a five-point scale (1 = strongly agree, 2 = agree, 3 = neither agree nor disagree, 4 = disagree, 5 = strongly disagree), respondents were asked how much they agreed with the following statements: “you feel close to people at your school,” “you feel like you are part of your school,” and “you are happy to be at your school.” Responses were summed so that higher values represented lower levels of school attachment (α = 0.80).

In an effort to guard against spuriousness, age and race/ethnicity are included as statistical controls in the multivariate analysis. Age was measured in years at wave II (M = 15.47, SD = 1.25). Race/ethnicity was controlled for using a host of dichotomous variables, specifically Black, Asian, Latina, and Other (1 = yes, 0 = no) with non-Hispanic Whites as the reference group. Respondents who were currently pregnant at the time of wave II interview (n = 67) were also controlled for in the analyses. Baseline (or wave I) measures of depression (α = 0.86) and substance use behaviors, specifically
alcohol problems ($\alpha = 0.78$), marijuana use (10% reported involvement), and illicit drug use (3% reported involvement) were controlled for in multivariate analyses.

Analytic Strategy

The analysis proceeds in several stages. First, a test for multicollinearity was conducted. Results indicated that there is no evidence of harmful multicollinearity (VIF range = 1.04 to 1.70, mean VIF = 1.29). Second, after presenting descriptive statistics, a series of negative binomial regression models were estimated examining the relationship between teenage pregnancy and depression, net of control variables. Third, a series of negative binomial regression models were estimated examining the relationship between teenage pregnancy and alcohol problems. This particular statistical model is warranted due to the overdispersion in the depression (mean = 1.08, variance = 6.68) and alcohol measures (mean = 13.96, variance = 46.96). Fourth, to check for heteroscedasticity in the negative binomial regression models, the Bruesch-Pagan test was used. The results indicated the presence of heteroscedasticity; therefore, robust standard errors were estimated. Next, due to the dichotomous nature of other dependent variables, a series of logistic regression models were estimated investigating the relationship between teenage pregnancy and other maladaptive behaviors (i.e., marijuana use and hard drug use).

The research questions call for the investigation of moderation effects when it comes to deviant peers. Therefore, a host of interaction terms were created. Initial two-way interactions were created between teenage pregnancy and deviant peers, as well as teenage pregnancy and depression. A three-way interaction term (Teenage Pregnancy $\times$ Depression $\times$ Deviant Peers) was also created to test the hypothesis that those who experience strain, negative emotions, and associate with deviant peers are more inclined
to engage in deviant behavior. It is believed that the effect of teenage pregnancy on substance use outcomes will increase as both association with deviant peers and depression increases. Analysis of three-way interaction requires the inclusion of various two-way interactions between the variables that make up the three-way interaction term (see Baron, 2011; Figlio, 2006). To reduce issues related to multicollinearity, variables were mean-centered prior to creating interaction terms (see Aiken & West, 1991). All analyses were estimated in STATA 13 (StataCorp, College Station, TX).

Results

Table 2.1 summarizes the descriptive statistics for the study variables included in the analyses. Keep in mind that the sample is comprised solely of female adolescents. The average age is 15.47 years. Approximately 60 percent of the sample is white, while the remaining 40 percent is composed of other races and ethnicities. Approximately 5 percent of the sample reported having ever been pregnant ($n = 265$). With regards to the binary dependent variables, nearly 14 percent reported marijuana use ($n = 746$), and 3 percent reported hard drug use ($n = 153$).
Agnew (1992) argues that that strain leads to negative emotions. Model 1 in Table 2.2 provides results of a negative binomial regression used to test this hypothesis. Teenage pregnancy is statistically significant and positively associated with an increase in depression ($b = 0.07, p < .001$), consistent with the predictions of GST.

To assess the moderating effect of deviant peers, model 2 in Table 2.2 includes the two-way interaction term (i.e., deviant peers $\times$ teenage pregnancy). The interaction effect between deviant peers and teenage pregnancy was not significantly associated with depression. Turning to the control variables, across both models, low self-control, low

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent Variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
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</tr>
<tr>
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</tr>
<tr>
<td>Hard Drug Use</td>
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</tr>
<tr>
<td><strong>Independent Variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
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</tr>
<tr>
<td>Depression</td>
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<td>6.85</td>
</tr>
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</tr>
<tr>
<td>Latina</td>
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<td>--</td>
</tr>
<tr>
<td>Other</td>
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<td>--</td>
</tr>
<tr>
<td>Age</td>
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</tr>
<tr>
<td>Currently Pregnant</td>
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</tr>
<tr>
<td>Depression (Wave I)</td>
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<td>6.90</td>
</tr>
<tr>
<td>Alcohol Problems (wave I)</td>
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<tr>
<td>Marijuana Use (wave I)</td>
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<td>--</td>
</tr>
<tr>
<td>Hard Drug Use (wave I)</td>
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<td>--</td>
</tr>
</tbody>
</table>

Source: National Longitudinal Study of Adolescent to Adult Health.
Note: N = 5,236; SD = Standard Deviation.
self-esteem, low school attachment, social support, and race/ethnicity were significant predictors of depression.
Table 2.2
Effect of Teenage Pregnancy on Depression (N = 5,236)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th></th>
<th>Model 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$b$</td>
<td>SE</td>
<td>$b$</td>
<td>SE</td>
</tr>
<tr>
<td>Teenage Pregnancy</td>
<td>0.07</td>
<td>0.02***</td>
<td>0.07</td>
<td>0.03*</td>
</tr>
<tr>
<td>Low Self-Control</td>
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<td>0.00**</td>
<td>-0.005</td>
<td>0.00***</td>
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<td>0.00***</td>
<td>0.03</td>
<td>0.00***</td>
</tr>
<tr>
<td>Parental Attachment</td>
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<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Low School Attachment</td>
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<td>0.00***</td>
<td>0.01</td>
<td>0.00***</td>
</tr>
<tr>
<td>Social Support</td>
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<td>0.00***</td>
<td>-0.01</td>
<td>0.00***</td>
</tr>
<tr>
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<td>0.02***</td>
</tr>
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<td>0.09</td>
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</tr>
<tr>
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<td>0.02**</td>
<td>0.05</td>
<td>0.02**</td>
</tr>
<tr>
<td>Other</td>
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<td>0.03**</td>
<td>0.08</td>
<td>0.03**</td>
</tr>
<tr>
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<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Depression (wave 1)</td>
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<td>0.03</td>
<td>0.00***</td>
</tr>
<tr>
<td>Deviant Peers</td>
<td>--</td>
<td>--</td>
<td>0.04</td>
<td>0.01***</td>
</tr>
<tr>
<td>Deviant Peers × Teenage Pregnancy</td>
<td>--</td>
<td>--</td>
<td>-0.02</td>
<td>0.03</td>
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<table>
<thead>
<tr>
<th></th>
<th>LR test of $\alpha$=0</th>
<th>Wald $\chi^2$</th>
<th>McFadden R²</th>
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<tbody>
<tr>
<td></td>
<td>3053.60***</td>
<td>3036.19***</td>
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</tr>
<tr>
<td></td>
<td>3102.76***</td>
<td>3073.10***</td>
<td>0.09</td>
</tr>
</tbody>
</table>

Note: LR = likelihood ratio chi-square statistic; SE = robust standard errors; $b$ = negative binomial regression coefficients. *$p < .05$, **$p < .01$, ***$p < .001$. 
Table 2.3 displays the results of negative binomial regression models investigating the relationship between teenage pregnancy and alcohol problems. In model 1, the effect of teenage pregnancy is positive and significant \((b = 0.44, p < .05)\). In other words, those who reported being pregnant were more likely to report having alcohol problems when compared to those who did not report a pregnancy. Low self-control, social support, race/ethnicity, currently pregnant, and age were all significant predictors of alcohol problems. For example, consistent with Gottfredson and Hirschi’s (1990) theory, low self-control was a significant and positive predictor of alcohol problems \((b = 0.04, p < .001)\). Regarding social support, females with higher levels of social support were less likely to engage in alcohol related behaviors \((b = -0.05, p < .001)\). As for race/ethnicity, Blacks \((b = -0.93, p < .001)\), Asians \((b = -0.73, p < .001)\), and Latinas \((b = -0.36, p < .001)\) were all significantly less likely to report alcohol problems when compared to their white female counterparts. The prevalence of alcohol problems decreased as age increased.

According to Agnew, negative emotions should mediate the relationship between strain and coping. In model 2 depression is added into the equation (see Table 2.3). However, it does not mediate the relationship between teenage pregnancy and alcohol problems. More specifically, teenage pregnancy estimate remains significant, but is reduced from 0.44 to 0.38. After testing the equality of regression coefficients (see Paternoster, Brame, Mazerolle, & Piquero, 1998), the \(z\)-test revealed that there is no significant difference between coefficients \((z = 0.25; p > .05, \text{ one-tailed test})\).³

³To assess the slope invariance between two unstandardized regression slope coefficients, the \(z\)-test was used (Paternoster et al., 1998:862):

\[
Z = \frac{b_1 - b_2}{\sqrt{SEb_1^2 + SEb_2^2}}
\]
The third model investigates the moderating effect of deviant peers and teenage pregnancy on alcohol problems. After controlling for other theoretically relevant factors, no significant two-way interaction effect was observed. Consistent with prior research, deviant peers, however, is significantly associated with alcohol problems (see Dishion & Loeber, 1985). More specifically, individuals who associate with deviant peers are more likely to report having alcohol related problems ($b = 0.88, p < .001$). Model 4 adds the three-way interaction term between teenage pregnancy, depression, and deviant peers. Similar to past research, this model controls for the other two-way interaction effects that make up the three-way interaction term (see Baron, 2011). The three-way interaction term is positively and significantly associated with alcohol problems ($b = 0.05, p < .05$), suggesting that adolescents who experienced teenage pregnancy, depression, and associated with deviant peers were likely to report higher levels of alcohol problems (see figure 2.1).
Table 2.3
Effect of Teenage Pregnancy on Alcohol Problems (N = 5,236)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
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<td></td>
<td>b</td>
<td>SE</td>
<td>b</td>
<td>SE</td>
</tr>
<tr>
<td>Teenage Pregnancy</td>
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<td>0.18*</td>
<td>0.38</td>
<td>0.17*</td>
</tr>
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<td>0.01***</td>
<td>0.04</td>
<td>0.01***</td>
</tr>
<tr>
<td>Low Self-Esteem</td>
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<td>0.01</td>
<td>-0.01</td>
<td>0.01</td>
</tr>
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<td>0.01</td>
<td>-0.02</td>
<td>0.01</td>
</tr>
<tr>
<td>Low School Attachment</td>
<td>-0.01</td>
<td>0.02</td>
<td>-0.03</td>
<td>0.01</td>
</tr>
<tr>
<td>Social Support</td>
<td>-0.05</td>
<td>0.01***</td>
<td>-0.03</td>
<td>0.01*</td>
</tr>
<tr>
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<td>-0.98</td>
<td>0.11***</td>
</tr>
<tr>
<td>Asian</td>
<td>-0.73</td>
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<td>-0.78</td>
<td>0.18***</td>
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<tr>
<td>Latina</td>
<td>-0.36</td>
<td>0.12**</td>
<td>-0.41</td>
<td>0.14**</td>
</tr>
<tr>
<td>Other</td>
<td>0.19</td>
<td>0.19</td>
<td>-0.23</td>
<td>0.19</td>
</tr>
<tr>
<td>Age</td>
<td>-0.09</td>
<td>0.03**</td>
<td>0.09</td>
<td>0.03***</td>
</tr>
<tr>
<td>Currently Pregnant</td>
<td>-0.26</td>
<td>0.33</td>
<td>-0.30</td>
<td>0.31</td>
</tr>
<tr>
<td>Alcohol Problems (wave 1)</td>
<td>0.30</td>
<td>0.02***</td>
<td>0.29</td>
<td>0.02***</td>
</tr>
<tr>
<td>Depression</td>
<td>--</td>
<td>--</td>
<td>0.04</td>
<td>0.01***</td>
</tr>
<tr>
<td>Deviant Peers</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Deviant Peers × Teenage Pregnancy</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Deviant Peers × Depression</td>
<td>--</td>
<td>--</td>
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<td>--</td>
</tr>
<tr>
<td>Teenage Pregnancy × Depression</td>
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<tr>
<td>Teenage Pregnancy × Depression × Deviant Peers</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>LR test of α=0</td>
<td>768.22***</td>
<td>821.12***</td>
<td>1286.81***</td>
</tr>
<tr>
<td></td>
<td>Wald χ²</td>
<td>700.94***</td>
<td>688.96***</td>
<td>896.89***</td>
</tr>
<tr>
<td></td>
<td>McFadden R²</td>
<td>0.06</td>
<td>0.07</td>
<td>0.10</td>
</tr>
</tbody>
</table>

Note: LR = likelihood ratio chi-square statistic; SE = robust standard errors; b = negative binomial regression coefficients.  
* p < .05, ** p < .01, *** p < .001.
Due to the dichotomous nature of the dependent variables, the next two tables present results from a series of logistic regression models to test the hypotheses. Model 1 in Table 2.4 examines the relationship between teenage pregnancy and marijuana use. The effect of teenage pregnancy is positive and significantly associated with smoking marijuana ($b = 0.47$, $p < .05$). Other predictors of marijuana use include: low self-control, low self-esteem, low school attachment, social support, being black, and being currently pregnant. These findings are largely consistent with theoretical expectations and previous research.

Model 2 in Table 2.4 examines the mediating impact of depression on the relationship between teenage pregnancy and marijuana use. Depression fails to mediate the relationship between teenage pregnancy and marijuana use. Results from the z-test
indicate that there is no significant difference between regression coefficients \( (z = 0.14, p > .05) \). In model 3, the interactive effects of teenage pregnancy and deviant peers on marijuana use are tested. No moderating effects were observed for the two-way interaction term. While that is the case, it is important note that the relationship between teenage pregnancy and marijuana use is fully mediated after the inclusion of depression, deviant peers, and the two-way interaction term into the equation. Finally, model 4 examines a three-way interaction between teenage pregnancy, depression, and deviant peers. Individuals who experience pregnancy as a teen, have high levels of depressive symptoms, and associate with deviant peers were likely to report using marijuana \( (b = 0.07, p < .05; \text{see figure 2.2}) \).
Table 2.4
Effect of Teenage Pregnancy on Marijuana Use (N = 5,236)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b</td>
<td>SE</td>
<td>b</td>
<td>SE</td>
</tr>
<tr>
<td>Teenage Pregnancy</td>
<td>0.47</td>
<td>0.21</td>
<td>0.43</td>
<td>0.21</td>
</tr>
<tr>
<td>Low Self-Control</td>
<td>0.05</td>
<td>0.01***</td>
<td>0.05</td>
<td>0.01***</td>
</tr>
<tr>
<td>Low Self-Esteem</td>
<td>0.03</td>
<td>0.01*</td>
<td>0.00</td>
<td>0.02</td>
</tr>
<tr>
<td>Parental Attachment</td>
<td>-0.01</td>
<td>0.02</td>
<td>-0.01</td>
<td>0.02</td>
</tr>
<tr>
<td>Low School Attachment</td>
<td>0.06</td>
<td>0.02***</td>
<td>0.06</td>
<td>0.02***</td>
</tr>
<tr>
<td>Social Support</td>
<td>-0.06</td>
<td>0.01***</td>
<td>-0.05</td>
<td>0.01***</td>
</tr>
<tr>
<td>Black</td>
<td>-0.48</td>
<td>0.13***</td>
<td>-0.53</td>
<td>0.13***</td>
</tr>
<tr>
<td>Asian</td>
<td>-0.16</td>
<td>0.23</td>
<td>-0.22</td>
<td>0.22</td>
</tr>
<tr>
<td>Latina</td>
<td>0.07</td>
<td>0.13</td>
<td>0.02</td>
<td>0.13</td>
</tr>
<tr>
<td>Other</td>
<td>0.29</td>
<td>0.18</td>
<td>0.23</td>
<td>0.19</td>
</tr>
<tr>
<td>Age</td>
<td>-0.01</td>
<td>0.04</td>
<td>-0.01</td>
<td>0.04</td>
</tr>
<tr>
<td>Currently Pregnant</td>
<td>-2.06</td>
<td>0.58***</td>
<td>-2.15</td>
<td>0.58***</td>
</tr>
<tr>
<td>Marijuana Use (wave 1)</td>
<td>2.46</td>
<td>0.10***</td>
<td>2.44</td>
<td>0.10***</td>
</tr>
<tr>
<td>Depression</td>
<td>--</td>
<td>--</td>
<td>0.04</td>
<td>0.01***</td>
</tr>
<tr>
<td>Deviant Peers</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Deviant Peers × Teenage Pregnancy</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Deviant Peers × Depression</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Teenage Pregnancy × Depression</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Teenage Pregnancy × Depression × Deviant Peers</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

Wald $\chi^2$ 938.96*** 1008.90*** 1305.74*** 1390.42***
McFadden $R^2$ 0.21 0.21 0.35 0.35

Note: Entries are unstandardized logistic regression coefficients $(b)$, and robust standard errors (SE).
*p < .05, **p < .01, ***p < .001.
Table 2.5 presents hard drug use models. In model 1 teenage pregnancy is a significant predictor of hard drug use. Put simply, those who reported a pregnancy were more likely to use hard drugs than those who were not pregnant ($b = 0.92$, $p < .01$). There were several predictors of hard drug use, including low self-control, parental attachment, low school attachment, social support, and being Asian. Similar to previous results, model 2 shows that depression is a significant predictor of hard drug use ($b = 0.03$, $p < .01$). However, depression does not have a mediating influence on the relationship between teenage pregnancy and hard drug use. After the inclusion of depression into the model 2, teenage pregnancy coefficient is only reduced from .92 to .89 and remains significant. An assessment of the equality of regression coefficients reveals that there was no significance difference between coefficients across models ($z = 0.14$, $p > .05$). In
model 3 the two-way interaction between deviant peers and teenage pregnancy was not significant. Interestingly, the relationship between teenage pregnancy and hard drug use is no longer significant after including deviant peer association and the two-way interaction term into the model. In model 4, the three-way interaction term (i.e., Teenage Pregnancy × Depression × Deviant Peers) enters the model. There was no significant effect observed.
Table 2.5  
Effect of Teenage Pregnancy on Hard Drug Use ($N = 4,102$)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th></th>
<th>Model 2</th>
<th></th>
<th>Model 3</th>
<th></th>
<th>Model 4</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$b$</td>
<td>SE</td>
<td>$b$</td>
<td>SE</td>
<td>$b$</td>
<td>SE</td>
<td>$b$</td>
<td>SE</td>
</tr>
<tr>
<td>Teenage Pregnancy</td>
<td>0.92</td>
<td><strong>0.30</strong></td>
<td>0.89</td>
<td><strong>0.31</strong></td>
<td>0.56</td>
<td>0.72</td>
<td>0.70</td>
<td>0.82</td>
</tr>
<tr>
<td>Low Self-Control</td>
<td>0.06</td>
<td><strong>0.02</strong></td>
<td>0.05</td>
<td><strong>0.02</strong></td>
<td>0.04</td>
<td><strong>0.02</strong></td>
<td>0.04</td>
<td><strong>0.02</strong></td>
</tr>
<tr>
<td>Low Self-Esteem</td>
<td>0.03</td>
<td>0.02</td>
<td>0.01</td>
<td>0.02</td>
<td>0.02</td>
<td>0.03</td>
<td>0.02</td>
<td>0.03</td>
</tr>
<tr>
<td>Parental Attachment</td>
<td>-0.05</td>
<td><strong>0.02</strong></td>
<td>-0.05</td>
<td><strong>0.02</strong></td>
<td>-0.05</td>
<td><strong>0.02</strong></td>
<td>-0.05</td>
<td><strong>0.02</strong></td>
</tr>
<tr>
<td>Low School Attachment</td>
<td>0.10</td>
<td><strong>0.03</strong></td>
<td>0.10</td>
<td><strong>0.03</strong></td>
<td>0.06</td>
<td>0.03</td>
<td>0.06</td>
<td>0.03</td>
</tr>
<tr>
<td>Social Support</td>
<td>-0.06</td>
<td><strong>0.02</strong></td>
<td>-0.05</td>
<td><strong>0.02</strong></td>
<td>-0.02</td>
<td>0.03</td>
<td>-0.02</td>
<td>0.03</td>
</tr>
<tr>
<td>Asian</td>
<td>-1.86</td>
<td><strong>0.67</strong></td>
<td>-1.90</td>
<td><strong>0.67</strong></td>
<td>-1.61</td>
<td>0.67</td>
<td>-1.61</td>
<td>0.66</td>
</tr>
<tr>
<td>Latina</td>
<td>-0.36</td>
<td>0.23</td>
<td>-0.40</td>
<td>0.23</td>
<td>-0.22</td>
<td>0.29</td>
<td>-0.20</td>
<td>0.28</td>
</tr>
<tr>
<td>Other</td>
<td>-0.38</td>
<td>0.45</td>
<td>-0.42</td>
<td>0.45</td>
<td>-0.57</td>
<td>0.39</td>
<td>-0.57</td>
<td>0.39</td>
</tr>
<tr>
<td>Age</td>
<td>-0.08</td>
<td>0.07</td>
<td>-0.09</td>
<td>0.07</td>
<td>-0.16</td>
<td>0.08</td>
<td>-0.17</td>
<td>0.08</td>
</tr>
<tr>
<td>Currently Pregnant</td>
<td>-1.41</td>
<td>1.00</td>
<td>-1.48</td>
<td>1.00</td>
<td>-0.94</td>
<td>0.86</td>
<td>-0.85</td>
<td>0.84</td>
</tr>
<tr>
<td>Hard Drug Use (wave 1)</td>
<td>2.32</td>
<td><strong>0.22</strong></td>
<td>2.31</td>
<td><strong>0.22</strong></td>
<td>1.88</td>
<td><strong>0.25</strong></td>
<td>1.84</td>
<td><strong>0.25</strong></td>
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<tr>
<td>Depression</td>
<td>--</td>
<td>--</td>
<td>0.03</td>
<td><strong>0.01</strong></td>
<td>0.02</td>
<td>0.01</td>
<td>0.04</td>
<td><strong>0.02</strong></td>
</tr>
<tr>
<td>Deviant Peers</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>1.14</td>
<td><strong>0.09</strong></td>
<td>1.19</td>
<td><strong>0.09</strong></td>
</tr>
<tr>
<td>Deviant Peers × Teenage Pregnancy</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.00</td>
<td>0.46</td>
<td>0.03</td>
<td>0.53</td>
</tr>
<tr>
<td>Deviant Peers × Depression</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>-0.02</td>
<td>0.01</td>
</tr>
<tr>
<td>Teenage Pregnancy × Depression</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>-0.03</td>
<td>0.07</td>
</tr>
<tr>
<td>Teenage Pregnancy × Depression × Deviant Peers</td>
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<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>-0.01</td>
<td>0.04</td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th>Wald $\chi^2$</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>311.24***</td>
<td>324.68***</td>
<td>419.30***</td>
<td>444.24***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>McFadden R²</td>
<td>0.18</td>
<td>0.19</td>
<td>0.28</td>
<td>0.28</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Entries are unstandardized logistic regression coefficients ($b$), and robust standard errors (SE). Blacks were omitted from the analysis.

*p < .05. **p < .01. ***p < .001.
Overall, these findings highlight both the relationship between teenage pregnancy and maladaptive behaviors, and the moderating impact of deviant peers. Put differently, deviant peers facilitate maladaptive behavior, specifically alcohol problems and marijuana use among females who experience pregnancy during adolescence and have symptoms of depression. To investigate the anticipated strain of teenage pregnancy, supplementary analyses (not shown) were conducted. In the discussion that follows, the implications of these results for theory, research, and social programs designed to assist teen parents are discussed.

**Discussion and Conclusions**

This study examined the connections between teen pregnancy and substance use. Building on prior research (see Hope et al., 2003), the analyses were informed by Agnew’s (1992, 2006) general strain theory. Within this theoretical framework, teenage pregnancy reflects a stressful life event for young women that leads to negative emotionality (i.e., depression), and ultimately increases the risk of maladaptive coping in the form of substance use. Criminologists are aware of the consequences of deviant peer associations, specifically their role in facilitating delinquency (see Hoeben et al., 2016). Less is known about the impact of deviant peers in the coping process, especially for individuals who experience the strain of teenage pregnancy. This study investigated the moderating effect of deviant peers on the relationship between strain and substance use outcomes. The findings from this research contribute to the GST literature, identify some

---

4 To further explore the relationship between teenage pregnancy and maladaptive coping, additional analyses investigating Agnew’s (2002) anticipated strain hypothesis were conducted. Respondents were asked whether they agreed or disagreed with the statement that “getting pregnant at this time in your life is one of the worst things that could happen to you.” No significant effects were detected between the anticipated strain of teenage pregnancy and maladaptive coping outcomes. In other words, experienced strain is more important than anticipated strain when it comes to teenage pregnancy.
avenues for future scholarship, and also provide direction for strategies aimed at addressing the needs of females who experience teenage pregnancy.

Agnew (1992) argues that strains and stressors increase the likelihood of experiencing negative emotions, such as anger, frustration, and depression. These emotions create pressure for corrective action, with crime being one possible outcome. In support of the GST hypothesis that strain leads to negative emotions, teenage pregnancy was a significant predictor of depression. Also consistent with GST, teenage pregnancy was a significant predictor of substance use. However, the effect of teen pregnancy on these forms of maladaptive coping was not mediated by negative emotionality. Although Hope and colleagues (2003) found a positive relationship between teen pregnancy and delinquency, they used a general measure of delinquency and did not consider specific forms of maladaptive coping examined here (i.e., drug and alcohol use). Also, they did not assess the role of negative emotions or deviant peers in facilitating criminal behavior among those who experience teenage pregnancy. In addition to lending support to GST, the results also highlight the importance of including unique types of offending and crime analogous behaviors for future research.

In line with decades of research on juvenile delinquency, the analyses revealed that deviant peer association was a consistent predictor of all maladaptive behavioral outcomes. Peer association also played a role in the relationship between teenage pregnancy and substance use. Although there were no significant effects detected for the two-way interaction term (Teenage Pregnancy × Deviant Peers) on substance use outcomes, there were significant effects observed for the three-way interaction term (Teenage Pregnancy × Depression × Deviant peers). The effect of teen pregnancy on
alcohol problems and marijuana use was stronger when respondents reported depressive symptoms and had deviant peers. These findings highlight the importance of deviant peers in the coping process. Strained individuals may seek out deviant peers as a way to cope with strain, in this case teenage pregnancy. Consequently, the combination of strain, negative emotions, and deviant peers increases the risk of maladaptive coping. Future tests of GST should include deviant peers in examining the relationship between strain and maladaptive coping.

Consistent with a host of studies focused on juvenile populations and other offending contexts, the analyses demonstrated that a variety of well-known crime correlates were linked to offending and several crime analogous outcomes. For example, low self-control was a consistent and robust predictor of alcohol problems, marijuana use, and hard drug use. Similarly, that low school attachment is linked to marijuana and hard drug use, while low self-esteem was associated with increased marijuana use. All too often, criminological research takes a “glass half empty” approach to the study of crime and delinquency. It is important, however, to also acknowledge factors and circumstances that decrease offending and other forms of maladaptive coping. Toward that end, the salience of social support and parental attachment in reducing offending and other negative behaviors warrants further attention. Coping with strain is arguably influenced by access to supportive networks. Social programs and related efforts designed to assist young women would be well-advised to help them identify sources of support beyond the family (e.g., teachers, coaches, or community leaders) who are able to promote involvement in positive activities and encourage prosocial ways of coping with the stressors of teenage pregnancy.
As is the case with most research, this study is not without limitations. To be sure, the Add Health data are a rich source of information for testing GST and other theories of offending across a variety of crime contexts. The analyses tested the importance of family, peer, and school factors in facilitating as well as reducing maladaptive coping. However, other key variables germane to the study’s focus on teen pregnancy as a strain were lacking. Available evidence shows that females who become pregnant as teens are likely to be stigmatized, experience social isolation and abuse, and have their educational journey truncated (Weinmann et al., 2005). Based on the findings from this study, surrounding individuals who experience strains with prosocial others seems to be important. That said, counseling programs and support groups may be beneficial in alleviating strain associated with teenage pregnancy. Such resources could provide females the opportunity to express their thoughts and feelings, as well as the opportunity to seek available options for coping with their situation. In addition, to prevent school failure, alternative education programs may benefit females who experience teenage pregnancy. Due to the secondary nature of these data, it is not possible to determine whether the sample had access to such programs, and the extent to which the availability and use of services lessened the impact of teen pregnancy on maladaptive coping. Future empirical efforts relying on original data collection to address teen pregnancy and its consequences should take care to directly measure access to social welfare and alternative education programs.

This study was primarily concerned with teenage pregnancy. However, prenatal depression can be a precursor to postpartum depression, which is depression that occurs
after childbirth (see Mollborn & Morningstar, 2009). Future research should assess the role of postpartum depression on maladaptive coping outcomes.

An additional limitation of the study is causal ordering. More specifically, data for the strain measure (i.e., teenage pregnancy) were drawn from waves I and II, asking females if they have ever been pregnant, and the dependent variables were taken from wave II. A large number of females became pregnant between waves I and II data collection. Although the observed relationships between strain and the outcomes of interest were in the direction predicted by GST, the results are nonetheless somewhat limited. Future research using longitudinal designs will shed light on the complex nature of these relationships and, in doing so, will increase the ability to make casual inferences.

In the end, this study highlights the salience of going beyond the prediction of teen pregnancy itself to the diverse set of consequences associated with this significant social problem. Although this approach has become increasingly common in other crime and victimization contexts, this study is one of just a few efforts to understand teen pregnancy from a GST perspective. In doing so, this study contributes to the extant literature on GST, as well as to parallel research efforts examining various non-offending consequences of teen pregnancy. Deviant peers have an effect on the behavior of individuals who experience strain. This finding suggests that the role of deviant peers is not limited to a social learning framework, but can be incorporated in other

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5 Additional analyses were conducted to assess the relationship between teenage pregnancy and substance use behaviors longitudinally, specifically using wave I teenage pregnancy measure to predict wave II outcomes. Similar findings emerged. Teenage pregnancy was a significant predictor of depression, alcohol problems, and marijuana use. Moreover, the three-way interaction terms remained significant suggesting that the effect of teen pregnancy on alcohol problems and marijuana use is strongest when depression is high and when respondents associate with delinquent peers.
criminological theories to explain criminal and deviant behavior. That said, there is still much to learn to better serve this vulnerable segment of the population.
References


CHAPTER 3
VICARIOUS VICTIMIZATION, NEGATIVE EMOTIONS, AND MALADAPTIVE COPING: INVESTIGATING THE MODERATING EFFECT OF DEVIANT PEERS

Introduction

In the United States, criminal victimization remains a social problem that severely impacts the lives of individuals. As a result, victimization continues to be a concern for researchers, educators, and clinicians. According to recent data from the National Crime Victimization Survey (NCVS), in 2016 there were approximately 5.7 million violent victimizations (e.g., rape, sexual assault, robbery, aggravated and simple assault) experienced by individuals aged 12 and older (Morgan & Kena, 2017). The overall violent victimization rate that year was 21.1 victimizations per 1000 persons age 12 and older. While victimization impacts society as a whole, young people are more likely to be victimized compared to adults. Data from the Office of Juvenile Justice and Delinquency Prevention (OJJDP) shows that most acts of violent victimization were experienced by young people (between the ages of 12 and 24 years old) when compared to their adult counterparts (age 25 and over). There are several negative consequences associated with victimization.

Victimization has detrimental effects on the lives of those who experience it, potentially increasing the risk of maladaptive coping. Studies have found that violent victimization is positively associated with depression (Hawker & Boulton, 2000; Manasse, & Ganem, 2009; Mitchell, Ybarra, & Finkelhon, 2007), substance use behaviors (Luk, Wang, & Simons-Morton, 2010; Tharp-Taylor, Haviland & D’Amico, 2009; Mitchell et al., 2007), and delinquency (Hay & Evans, 2006; Manasse & Hanem,
Criminologists have attempted to provide an explanation for how victimization may increase individuals’ involvement in criminal and deviant behavior. Most research examining the relationship between victimization and crime has focused on the effects of experienced victimization and less on its vicarious effects. This study contributes to GST literature by specifically investigating the relationship between vicarious victimization and violent offending.

Agnew’s (1992) general strain theory (GST) provides insight into the relationship between victimization and crime. The main argument of GST is that strain and stressors lead to negative emotions (e.g., anger, frustration, and depression), ultimately fostering criminal and deviant coping. Agnew (2001) argues that victimization is a key strain that is likely to lead to crime as it is viewed as unjust, high in magnitude, often occurs in areas where social control is low, and creates pressure or incentive to engage in crime.

According to GST, there are three ways that strains can impact someone’s life. Strain can be experienced (e.g., being victimized), anticipated (e.g., expectation of strain to continue or occur in the future), or vicariously experienced (e.g., witnessing strain experienced by others) (see Agnew, 2002). Most GST research investigating the strain-crime link has focused on the experienced variety, providing little scrutiny to the anticipated and vicarious strain hypotheses (see Agnew, 2002, 2006; Baron, 2009; Lin, Cochran, & Mieczkowski, 2011; McGrath, Marcum, & Copes, 2012). This study is primarily concerned with the vicarious strain hypothesis, specifically arguing that the effect of peer victimization negatively impacts the behavior of those within the same network. Arguably, strain experienced by relatives or close friends should have a significant impact on one’s personal behavior.
There are several mechanisms that contribute to the strain-crime relationship, one of which is deviant peers. There is a strong relationship between deviant peer affiliation and criminal and deviant behavior. Associating with deviant peers has been shown to increase personal involvement in negative conduct, such as crime and delinquency (Fergusson, Swain-Campbell, & Horwood, 2002; Haynie, 2002; Haynie & Osgood, 2005), and substance use (Fergusson et al., 2002; Van Ryzin, Foscoa, & Dishion, 2012). These findings remain consistent across perceptual (i.e., individuals perceptions of peer delinquency) and actual measures (i.e., friendship network analysis) of deviant peers (see Hoeben, Meldrum, Walker, & Young, 2016). Being that deviant peers promote criminal and deviant behavior, it is important investigate its role in the coping process. In light of GST, associating with deviant peers has been argued to influence maladaptive coping (see Agnew & White, 1992; Mazerolle & Maahs, 2000). Deviant peers may condition the effect of vicarious victimization on crime.

To date, the vicarious strain hypothesis has received minimal empirical scrutiny. Research assessing GST’s vicarious strain hypothesis has either used a cross-sectional design or relied on individuals’ perceptions of the victimization among those within their network (see Agnew, 2006; Baron, 2009; Lin et al., 2011). Guided by GST and using friendship network data from the National Longitudinal Survey of Adolescent to Adult Health (Add Health), the current study examines the relationship between vicarious strain (i.e., peer victimization) and maladaptive coping. It is anticipated that peer victimization will contribute to both depression and violent offending, depression will mediate the relationship between peer victimization and offending, deviant peers will moderate the relationship between peer victimization and violent offending, victimization of friends
will have a stronger effect on violence among those who are embedded in their network, and having an intense relationship with those peers will make the vicarious effect stronger.

**Literature Review**

*General Strain Theory*

GST is one of many theories that provide an explanation for criminal and deviant behavior. But GST is unique from other theories of crime causation as it is concerned with negative relationships with others. Agnew (1992) defines negative relationships as “relationships in which others are not treating the individual as he or she would like to be treated” (p. 50). GST implies that negative relationships lead to delinquency through negative emotions (e.g., anger, frustration, and depression). Although GST has focused on negative relationships as a primary stressor, there are other sources of strains that can also increase involvement in crime and delinquency.

Agnew (1992) asserts that there are three sources of strain: (1) the failure to achieve positive valued goals (e.g., failing to graduate from college or obtaining employment); (2) the presence of negative stimuli (e.g., experiencing victimization); and (3) the removal/absence of positive stimuli (e.g., death of a family member or close friend, or divorce from a spouse). These sources of strain may ultimately result in the development of negative emotions, thus increasing the likelihood of engaging in deviant coping. While scholars typically focus on illegitimate coping (e.g., delinquency and substance use) when testing GST, it is important to discuss the conditions that are likely to promote criminal coping.
Agnew (2001) claims that there are four conditions that give rise to criminal coping. First, strains that are viewed as unjust are significantly more likely to promote criminal and deviant behavior. These particular strains are likely to result in negative emotions favorable to crime, such as anger. Second, criminal coping is likely to occur when strains are perceived as high in magnitude. Strains that are high in magnitude not only inhibit an individual’s ability to cope with severe strains, but also hinder their ability to minimize the impact of intense strain, thus generating negative emotions. The third factor is the level of social control associated with the strain experienced. Individuals with low social control will be more likely to respond to strain maladaptively, while those with high levels of social control typically cope in a prosocial manner (Agnew, 2001). Social supports and resources needed to facilitate noncriminal coping are scarce among individuals who are low in direct control, conventional attachment, and conventional commitments. Lastly, criminal coping will result from strains that create pressure or incentives for criminal behavior either through lack of legitimate coping resources, or the association with others who model criminal behaviors in response to that strain (e.g., association with deviant peers). When evaluating criminal responses to strain, the type of strain endured must be considered.

The effect of strain on crime is a function of the type of strain experienced by the individual. Agnew (2001) claims that there are two types of strains that are likely to foster criminal and deviant outcomes: objective and subjective strain. Objective strains are events or conditions that are disliked by most members of a group regardless of group membership (e.g., physical assault and lack of adequate food or shelter). In contrast, subjective strain is more person specific as it refers to events or conditions that that are
disliked by the people who are experiencing or have experienced them. The evaluation of and response to strain is dependent on various factors, such as individual traits (e.g., self-control and anti-social personality) and personal and social resources (e.g., self-esteem, social support, and deviant peers). Agnew suggests that subjective strains are more likely to yield criminal behavior as they are more likely to generate negative emotions conducive to crime (i.e., anger). Froggio and Agnew (2007) found that subjective strains (e.g., school failure and romantic breakup) were more strongly associated with crime than objective strains.

Agnew (2002) posits that there are three types of strain, which are experienced, vicarious, and anticipated strain. Experienced strain refers to personal experiences, specifically with the presentation of negative stimuli (e.g., victimization). Agnew (2006) argues that the experience strain hypothesis is the most tested component of GST (see Agnew, Brezina, Wright, & Cullen, 2002; Aseltine, Gore, & Gordon, 2000; Baron, 2004; Broidy, 2001; Hay & Meldrum, 2010; Moon & Morash, 2017). Vicarious strain refers to the witnessing or knowing of actual strains experienced by people either in close proximity or within one’s network, especially family, close friends, or those within the same community (Broidy & Agnew, 1997). Strain experienced by an individual within a particular group may vicariously affect others within that specific network. This is especially true for networks where there is a high concern for the welfare others. Lastly, anticipated strain occurs when there is an expectation for strain to continue and/or occur in the future (Agnew, 2002). This particular type of strain is typically concerned with an individual’s negative outlook or expectations of the future.
A considerable amount of GST research has examined the experienced strain hypothesis while seldom testing the effect of vicarious strains on negative outcomes. This dearth in literature is problematic, especially when considering that the strain of criminal victimization does not only affect those who experience the trauma, but also the lives of others. In light of GST, the next section discusses research examining the vicarious strain hypothesis.

Vicarious Strain

The vicarious strain hypothesis suggests that strain or negative treatment experienced by others may affect the emotions and behavior of individuals who witness it, especially those within the same network (e.g., family members, friends, and community residents). Agnew (2002) asserts that there are multiple ways vicarious strain presents itself to an individual: (1) they may directly witness the strain endured by others, such as an assault, (2) they may hear others experience strain (e.g., gunshots, screams), or (3) they may learn about the strain endured by others, directly (e.g., from victims) and/or indirectly (e.g., media). There are certain characteristics of vicarious strain that are most likely to result in delinquency. More specifically, strains that occur to close others, to the members of groups to which individuals belong or identify with, are in close physical proximity, are not successfully resolved, or strains that are contagious (i.e., strains that have a high probability of affecting the individual) elevates the risk of criminal and deviant behavior (Agnew, 2002). In short, there are several ways vicarious strain promotes maladaptive coping.

There is variation in how vicarious strains have been operationalized. Vicarious strain is usually measured using perceptual measures asking respondents about their
friends’ victimization (see Baron, 2009), or asking respondents if they have witnessed violence (e.g., seeing someone being victimized; see Lin et al., 2011). GST provides little guidance on a desirable approach for measuring vicarious strain. Consequently, most studies have relied on perceptual measures. This may be due to data limitations and lack of theoretical clarity. The current study deviates from the norm by using friendship network data. This source of data provides an actual measure of the victimization experienced by the respondent’s friends. It also allows for testing whether having a more intense relationship with those victimized peers make the vicarious effect stronger.

**Victimization and Vicarious Strain**

Criminal victimization is associated with emotional, social, and behavioral problems, especially among the adolescent population. Victimization increases the risk of depression (Barchia & Bussey, 2010; Hawker & Boulton, 2000; Mitchell, Ybarra, & Finkelhor, 2007), substance use (Carson et al., 2008; Luk et al., 2010; Mitchell et al., 2007; Sullivan, Farell, & Kliewer, 2006; Tharp-Taylor et al., 2009), and crime and delinquency (Baron, 2004; Manasse & Gangem, 2009; Mitchell et al., 2007; Sullivan, Farell, & Kliewer, 2006). Moreover, there are long-term consequences of victimization. Widom and colleagues (2006) found that childhood victimization increases the risk of illicit drug use in middle adulthood. The effects of victimization are not limited to those who experience it, but also impact the lives of those who witness it.

Vicarious strains, like victimization, have been hypothesized to influence maladaptive coping. Agnew (2001) argues that vicarious victimization may upset individuals because people they care about have been harmed, ultimately pressuring them to cope in a delinquent manner. He provides reasons why vicarious strain may promote
delinquency. Specifically, individuals may engage in delinquency to (1) prevent additional harm to those they care about, (2) seek revenge against those they believe are responsible for the harm, and (3) to alleviate negative emotions. Studies testing GST’s vicarious strain hypothesis have found that witnessing victimization is associated with criminal and deviant behavior (e.g., Agnew, 2002; Baron, 2009; Lin et al., 2011; McGrath et al., 2012; Zavala & Spohn, 2012). Agnew’s (2002) study was one of the first to explore the vicarious effects of victimization. He found that vicarious victimization, specifically victimization of friends and family, was associated with an increase in delinquency.

Baron’s (2009) study examined the role of violent personal, vicarious, and anticipated victimization on youths’ violent offending. In this particular study, vicarious strain was measured by asking respondents how many of their friends were a victim of an assault, minor assault, or had threat or force used against them to get things. Baron found that all three types of strains were significantly associated with self-reported violent offending. In addition, the relationship between vicarious strain and violence was moderated by low self-control. Lin and colleagues’ (2011) study tested the vicarious strain hypothesis and its effect on violent/property crime and drug use. Here vicarious strain was operationalized by asking adolescents if they ever saw someone being stabbed with a knife, sexually assaulted/raped, robbed/mugged, threatened with a weapon, being hit or kicked/beaten, or getting shot. They found that violent vicarious strain was significantly related to self-reported delinquency. Similarly, Eitle and Turner (2002) examined the effect of witnessing community violence, learning about the violent victimization of a significant other (e.g., domestic violence), and being exposed to
traumatic news (e.g., hearing about a friend being jumped) on criminal behavior. They found that all sources of vicarious strain increased the risk for criminal behavior, thus lending support to Agnew’s vicarious strain hypothesis. In sum, there are several studies showing that individuals who have witnessed others experience victimization, either indirectly or directly, are more likely to engage in maladaptive coping behavior. However, this is fairly uncommon as most adolescents’ exposure to victimization may be through hearing about things that occurred to their friends especially within networks where levels of involvement is high and there is a high concern for the welfare of others.

It is important to highlight that there are limitations to studies thus far examining the role of vicarious strain on negative outcomes (i.e., negative emotions and deviant behavior). First, research thus far has relied on a cross-sectional design making it difficult to make casual inferences (see Agnew, 2002; Baron, 2009; Lin et al., 2011; Zavala & Spohn, 2013). Second, studies have relied on perceptual measures of deviant behavior by either asking respondents to report on their friends level of victimization (e.g., “how many of their friends had been the victim of a serious assault; a minor assault; and having someone use threats or force against them to get things”) (see Baron, 2009; Eitle & Turner, 2002), or by asking respondents to report on how often they witnessed victimization, such as seeing somebody get shot or stabbed, beat up, or have their property stolen (e.g., Agnew, 2002; Kort-Butler, 2010; McGrath et al., 2012; Zavala & Spohn, 2013). To address these limitations, the current study employs a longitudinal design to assess the relationship between vicarious victimization and violent offending. Agnew argues that strain will have a greater effect on an individual’s behavior when people he or she cares about are harmed. Since vicarious victimization occurs by having
friends who are victimized, the use of friendship network data is beneficial as it allows one to capture the actual victimization taking place within a network. Similarly, it is also possible to assess respondents’ friends’ levels of delinquency.

**Vicarious Strain and Deviant Peers**

Deviant peers are associated with a host of negative outcomes. Research shows that associating with deviant peers increases involvement in substance use, as well as criminal and delinquent behaviors (see Hoeben et al., 2016). GST suggests that deviant peers will promote criminal and deviant behavior among those who experience strain by (1) supplying a form of support for criminal behavior, (2) considering certain acts as an appropriate response to strain, and (3) serving as instigators. Agnew (1992, 2006) argues that those with deviant peers are more likely to have access to deviant coping strategies and view deviance as an attractive or appropriate response to stressful situations.

Arguably, individuals who experience strain, especially physical victimization, may cope by associating with deviant peers, thus increasing their involvement in maladaptive behaviors. Interestingly, this research has primarily focused on experienced strain when examining the role of deviant peers in the coping process, and findings have been mixed. Agnew and White (1992) found that deviant peers moderated the relationship between strain and drug use. Similarly, Mazerolle and Maahs (2000) found the relationship between strain and delinquency was conditioned by delinquent peers. While prior work has examined whether the effect of experienced strain (e.g., personal victimization) depends on peer delinquency, it remains unknown whether the effect of vicarious strain (e.g., peer victimization) on violent offending is conditioned violent peers.
**Vicarious Strain and Network Characteristics**

When assessing the effect of vicarious strain on maladaptive coping, friendship network data can provide a better understanding of the peer victimization and crime relationship. According to McGloin and Shermer (2009), network data provides information on a social group’s cohesion, a person’s position within their group, and the level of social interaction among those within a network. With regards to social cohesion, as the level of density (i.e., the ratio of present social ties compared to all potential social ties) within networks increases, so too does the level of cohesiveness (Wasserman & Faust, 1994). In turn, individuals who are members of dense networks tend to have more direct connections to and interaction with their peers ultimately making them aware of what is happening within their network. In other words, individuals in dense networks should be aware of the behavior and victimization experiences of their friend(s). Arguably, peer victimization would have a greater effect on those who are well embedded within their network, and vicarious effects should be more impactful as denser networks have stronger ties (Granovetter, 1977).

**Current Focus**

The vicarious strain hypothesis is one of the most under studied components of GST. With the limitations of previous research in mind, using friendship network data from the National Longitudinal Survey of Adolescent to Adult Health, the present study will examine the relationship between vicarious strain and maladaptive coping. The current study will test the following hypotheses:

H₁: Peer victimization increases depression.

H₂: Peer victimization increases personal involvement in violent offending.
H3: Depression mediates the relationship between peer victimization and violent offending.

H4: The effect of peer victimization on violent offending is conditioned by deviant peers.

H5: Peer victimization will have a more pronounced effect on violence among those deeply embedded within their network.

H6: Having a strong relationship with peers, specifically spending time with peers, amplifies the vicarious strain effect on violent offending.

Data and Methods

This study uses data from waves I and II of the National Longitudinal Survey of Adolescent to Adult Health (Add Health). Add Health is a nationally representative, school based sample of nearly 20,000 adolescents in the United States from grades 7 through 12 between 1994 and 1995. The survey was administered using a stratified sample design, stratifying schools by region, school size and type, urbanicity, race and ethnicity, and grade level. A total of 132 schools participated in data collection, of which 80 were high schools and the remaining 52 were middle schools. The in-school data were collected from students who were present on the day the surveys were administered. During this time, respondents had the opportunity to elicit friendship nominations from school rosters. Individuals who participated in the in-school survey were selected from the school roster to participate in the in-home data collection, specifically an in-home survey and interview. Participants were surveyed using computer-assisted personal interviews and audio computer-assisted self-interviews for sensitive questions. Information collected includes, but is not limited to, the respondent’s social and
demographic characteristics, risky behaviors, criminal activities, victimization experiences, self-efficacy, education and occupation of parents, and health status. To establish causal ordering, this study uses longitudinal data by also including measures from wave II.

Wave II data collection was conducted between April and August of 1996. All adolescents in grades 7 through 11 at wave I were included in wave II interviews, ultimately yielding a sample of 14,738. Measures were consistent across waves I and II.

The Add Health survey design is unique, allowing researchers to collect data on social networks. This study is limited to a portion of the Add Health data collected from particular schools; these data are referred to as the “saturation sample” ($n = 2,728$). A total of 16 schools were selected from rural and urban areas to take part in the in-home interviews. Individuals within the selected schools were allowed to nominate up to 10 friends, specifically five of their closest male and five of their closest female friends. After excluding cases with missing data using listwise deletion, the current analysis is based on interviews with 1,971 respondents.

**Dependent Variable**

**Violent offending.** While the Add Health study was primarily concerned with assessing the health behaviors, risks, and status of adolescents, four items assessed adolescents’ involvement in violent offending. Items were measured on a three-point scale ($0 = \text{never}, 1 = \text{once}, 2 = \text{more than once}$), respondents were asked during the past 12 months, how often did they get into a serious physical fight, hurt someone badly enough to need bandages or care from a doctor or nurse, pulled a knife or gun on someone, or shot or stabbed someone ($\alpha = 0.70$). Each item was recoded dichotomously,
indicating whether the respondent had engaged in that activity. Similar to Haynie and Payne (2004) the final violent offending scale, captured at wave II, is a binary response (0 = no violence and 1 = engaged in violence) indicating of whether the respondent participated in one or more of the four acts (M = 0.20).

Independent Variables

Peer victimization. Using in-school friendship network data that allows respondents to nominate up to ten friends, adolescents’ friendship networks are determined by all individuals the respondent identifies and nominates as a close friend. Defining each participant’s network enables researchers to identify the portion of friends in the network who have been violently victimized. To assess peer victimization, the current study uses a common 4-item violent victimization scale (see Guterman, Hahm, & Cameron, 2002; Schreck & Fisher, 2004). Respondents were asked during the past 12 months, how often have “someone pulled a knife or gun on you,” “someone shot you,” “someone cut or stabbed you,” or “you were jumped.” Responses ranged from 0 (never) to 2 (more than once). Each item was recoded dichotomously where 0 = no and 1 = at least once. The items are then summed with higher values representing higher levels of victimization (M = 0.29). To capture the absolute level of victimization occurring in the network, the victimization index is calculated for each network member and summed across all members. For each respondent, peer victimization was measured averaging the amount of victimization experienced by those within respondents’ network.

Intervening Variable

Depression. One of the most commonly used scales by social scientists to measure depressive symptoms in the general population is the Center for Epidemiological
Studies Depression (CES-D). This scale has been deemed reliable and valid (Radloff, 1977). The current study uses a 16-item scale consisting of measure adapted from CES-D to assess respondent’s levels of depression. Respondents were asked within the past seven days how often: (1) “you were bothered by things that usually don’t bother you”; (2) “you didn’t feel like eating, or your appetite was poor”; (3) “you felt that you could not shake off the blues, even with help from your family and your friends”; (4) “you felt that you were just as good as other people”; (5) “you had trouble keeping your mind on what you were doing”; (6) “you felt depressed”; (7) “you felt hopeful about the future”; (8) “you thought your life had been a failure”; (9) “you felt fearful”; (10) “you were happy”; (11) “you talked less than usual”; (12) “you felt lonely”; (13) “people were unfriendly to you”; (14) “you enjoyed life”; (15) “you felt sad”; and (16) “you felt that people disliked you.” Responses to each question ranged from 0 (never or rarely) to 3 (most of the time or all of the time). Items 4, 7, 10, and 14 were recoded so that higher values indicated greater levels of depression. A summated scale using the 16-items was constructed where higher values reflect greater levels of depression. The scale has high internal consistency in the study sample ($\alpha = 0.84$).

Moderating Variables

Deviant peers. During wave I data collection the deviant peers measure was operationalized using the same 4-items used to measure violent offending. Items were measured on a three-point scale (0 = never, 1 = once, 2 = more than once), respondents were asked during the past 12 months, how often did they “get into a serious physical fight,” “hurt someone badly enough to need bandages or care from a doctor or nurse,” “pulled a knife or gun on someone,” or “shot or stabbed someone.” Each item was
recoded dichotomously, indicating whether the respondent had engaged in that activity. The final violent offending scale is a binary response of whether the respondent participated in any of the four acts (0 = no violence, 1 = engaged in violence). Similar to previous research (see McGloin, 2009; McGloin & Shermer, 2009), deviant peers was measured by taking the mean value of offending items for the respondent’s friendship send network (M = 0.33).

Involvement. To assess respondent involvement with peers, for each friend nominated the respondent was asked two questions: (1) whether he or she had met the friend after school to hang out during the past week, and (2) whether the respondent spent time with the friend during the past weekend. Each item was coded dichotomously (0 = no, 1 = yes). Similar to previous research (e.g., Haynie & Osgood, 2005; McGloin & Shermer, 2009), involvement was measured by summing the two responses across friends and dividing this sum by the square root of the number of friends (M = 3.40, SD = 3.51). Higher values reflect greater levels of involvement with peers.

Density. This measure captures how embedded one is in a network. For conceptual consistency, similar to the deviant peer measure respondent’s send networks (i.e., the individuals that were nominated by respondents) were used. Values ranged from 0 to 1, where 0 reflected a network in which no one was connected, and 1 represented a network where all members where connected to each other (M = 0.21).

Control Variables

Personal victimization. Violent victimization is assessed using the same 4-items used to capture peer victimization measure. Respondents were asked during the past 12 months, how often have “someone pulled a knife or gun on you,” “someone shot you,”
“someone cut or stabbed you,” or “you were jumped.” Responses ranged from 0 (never) to 2 (more than once). Each item was recoded dichotomously where 0 = no and 1 = at least once. The items are then summed with higher values representing higher levels of victimization (M = 0.29).

In an attempt to guard against spuriousness, age, sex, and race/ethnicity are statistically controlled for in the multivariate analyses. Age was measured in years at wave II (M = 16.59, SD = 1.50). Regarding sex, male was a binary measure where 0 = female and 1 = male (M = 0.50). Race/ethnicity was controlled for using a dichotomous variable where 0 = non-white and 1 = White. Lastly, a baseline measure (i.e., from wave I) of violent offending (M = 0.35) was controlled for.

**Analytic Strategy**

To empirically assess the role of peer victimization on individuals’ self-reported violent offending, the analysis proceeds in three steps. First, descriptive statistics and bivariate correlations for study variables are calculated. Bivariate correlations are presented to detect any significant relationships between the dependent variable and the key independent variables, and to detect issues of multicollinearity. Second, to assess the relationship between peer victimization and violent offending, path analysis with maximum likelihood estimation is used. Path analysis allows for the assessment of all predicted pathways in a single model, including direct, indirect, and total effects. Being that the dependent variable is binary, logistic regressions were estimated. When examining moderating effects, variables were mean centered prior to creating interaction terms to alleviate problems associated with multicollinearity (Aiken & West, 1991). All models were estimated using Mplus 7.
Results

Table 1 summarizes descriptive statistics and presents Pearson’s correlation coefficients for each of the variables included in the study. Regarding descriptive statistics, the average age is 16.59 years. Approximately, 52 percent of the sample is white. Regarding the dependent variable, approximately 20 percent of the sample reported involvement in violent offending at wave II.

There are several significant correlations between the variables of interest. All of the Pearson’s coefficients are less than an absolute value of 0.50 indicating that there are no problems of collinearity. The correlation between the peer victimization and violent offending was positive ($r = .12, p < .01$). Violent offending was also correlated with depression ($r = .11, p < .01$), deviant peers ($r = .15, p < .01$), and involvement ($r = .11, p < .01$), all in the expected direction. Compared to prior research, the correlation between deviant peers and violent offending in the current study is fairly weak (see Henry, Tolan, & Gorman-Smith, 2001; Nofziger & Kurtz, 2005). One possible explanation for this could be the use of friendship network data, which arguably provides a more accurate amount of violence taking place within a network, rather than relying on respondents’ perceptions of peer behavior. Depression and moderating variables were also positively correlated with peer victimization ($p < .01$). Regarding the control variables, personal victimization, male, and prior violent behavior were significantly and positively correlated with violent offending and peer victimization at the .01 level.
Table 3.1
Descriptive Statistics and Bivariate Correlations for Study Variables ($N = 1,971$)

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<th></th>
<th>M</th>
<th>SD</th>
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<td>0.09*</td>
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<td>Deviant peers</td>
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<td>0.44*</td>
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<td>0.09*</td>
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<td>1.51</td>
<td>0.02</td>
<td>0.14*</td>
<td>0.20*</td>
<td>0.02</td>
<td>0.01</td>
<td>0.30*</td>
<td>0.11*</td>
<td>-0.21*</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Male</td>
<td>0.50</td>
<td>--</td>
<td>0.20*</td>
<td>0.13*</td>
<td>-0.13*</td>
<td>0.18*</td>
<td>-0.04</td>
<td>0.01</td>
<td>0.22*</td>
<td>0.01</td>
<td>0.09*</td>
<td>1.00</td>
</tr>
<tr>
<td>11.</td>
<td>Violent offending (WI)</td>
<td>0.35</td>
<td>--</td>
<td>0.40*</td>
<td>0.14*</td>
<td>0.12*</td>
<td>0.20*</td>
<td>0.01</td>
<td>0.08*</td>
<td>0.39*</td>
<td>-0.10*</td>
<td>0.01</td>
<td>0.24*</td>
</tr>
</tbody>
</table>

Source: National Longitudinal Study of Adolescent to Adult Health.
Note: Entries are Pearson’s correlation coefficients.
*p < .01 (two-tailed test)
To assess whether the associations between variables of interest persist net of other variables, multivariate analyses were conducted. First, the model in Table 3.2 assesses whether peer victimization is associated with depression. In support of hypothesis 1, results indicate that peer victimization is related to depression (OR = 1.61, \( p < .001 \)). Regarding the control variables, age, male, personal victimization and violent offending were all associated with depression in the expected direction. Moving forward, the focus shifts to examine the direct and indirect effects of peer victimization on violent offending.

**Table 3.2**  
Direct Effect of Peer Victimization on Depression (\( N = 1,971 \))

<table>
<thead>
<tr>
<th>Variable</th>
<th>( b )</th>
<th>SE</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peer victimization</td>
<td>0.47</td>
<td>0.08***</td>
<td>1.61</td>
</tr>
<tr>
<td>Age</td>
<td>0.75</td>
<td>0.08***</td>
<td>2.11</td>
</tr>
<tr>
<td>Male</td>
<td>-2.55</td>
<td>0.49***</td>
<td>0.08</td>
</tr>
<tr>
<td>White</td>
<td>-1.48</td>
<td>0.40***</td>
<td>0.23</td>
</tr>
<tr>
<td>Personal victimization</td>
<td>0.83</td>
<td>0.11***</td>
<td>2.29</td>
</tr>
<tr>
<td>Violent offending (W1)</td>
<td>1.51</td>
<td>0.25***</td>
<td>4.53</td>
</tr>
</tbody>
</table>

AIC 14293.98  
BIC 14383.64  
\( R^2 \) 0.11

Note: Entries are unstandardized logistic regression coefficients (\( b \)), odds ratios (OR), and robust standard errors (SE). Akaike (AIC), Bayesian (BIC), and McFadden’s R-square (\( R^2 \)).  
* \( p < .05 \), ** \( p < .01 \), *** \( p < .001 \). (two-tailed test)

Table 3.3 presents two models that assess the direct and indirect effects of peer victimization on violent offending. Model 1 presents a logistic regression examining the direct relationship between peer victimization and violent offending without the inclusion of the mediating variable. Here, the interest is in whether vicarious strain occurs through
having friends who are victimized. As expected, net of personal behavior, peer victimization does have an effect on violent offending. Specifically, every one-unit increase in peer victimization is associated with an 18 percent increase in violent offending (OR = 1.18, p < .05). This finding supports hypothesis 2. This model also shows that personal victimization is a predictor of violent offending, which is consistent with prior victimization research (see Nofziger & Kurtz, 2005; Turanovic, Reisig, & Pratt, 2015). For example, every one-unit increase in personal victimization is associated with a 64 percent increase in violent offending. Model 2 tests the mediating effect of depression on the relationship between peer victimization and violent offending. The model shows that higher levels of depression are associated with violent offending (OR = 1.03, p < 0.01). Interestingly, the direct effect of peer victimization does not change much after adding depression into the model. Path analyses were conducted to test the indirect effect of peer victimization on violent offending through depression (see Figure 3.1). Findings suggest that there is a significant indirect effect for peer victimization on violent offending via depression (OR = 1.01, p < .05). Although the effect is small, it can be concluded that there is only partial mediation as the relationship between peer victimization and violent offending remains significant. Overall, these observations fail to support hypothesis 3.
Table 3.3
Direct and Indirect Effect of Peer Victimization on Violent Offending (N= 1,971)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b</td>
<td>SE</td>
</tr>
<tr>
<td>Direct effects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peer victimization</td>
<td>0.16</td>
<td>0.07*</td>
</tr>
<tr>
<td>Age</td>
<td>-0.06</td>
<td>0.49</td>
</tr>
<tr>
<td>Male</td>
<td>0.57</td>
<td>0.16***</td>
</tr>
<tr>
<td>White</td>
<td>-0.29</td>
<td>0.09***</td>
</tr>
<tr>
<td>Personal victimization</td>
<td>0.49</td>
<td>0.11***</td>
</tr>
<tr>
<td>Violent offending (W1)</td>
<td>1.63</td>
<td>0.14***</td>
</tr>
<tr>
<td>Depression</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Indirect effect</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peer victimization via Depression</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

AIC          | 1602.14 | 14293.98 |
BIC          | 1641.24 | 14383.36 |
R²           | 0.28    | 0.28    |

Note: Entries are unstandardized logistic regression coefficients (b), odds ratios (OR), and robust standard errors (SE), Akaike (AIC), Bayesian (BIC), and McFadden’s R-square (R²).
*p < .05, **p < .01, ***p < .001 (two-tailed test).
Table 3.4 presents a series of logistic regressions examining moderating effects of peer victimization on violent offending. While no moderation effects were detected, failing to support hypotheses H4-H6, significant direct effects for deviant peers and involvement with peers on violent offending were observed. For example, every one-unit increase in deviant peers was associated with a 47 percent increase in involvement in violent offending (OR = 1.47, \(p < .05\)). Concerning involvement, every one-unit increase in involvement with peers was associated with a 9 percent increase in violent offending (OR = 1.09, \(p < .001\)). Furthermore, across all models personal victimization was significantly related to violent offending.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th></th>
<th></th>
<th>Model 2</th>
<th></th>
<th></th>
<th>Model 3</th>
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<tr>
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<td>b</td>
<td>SE</td>
<td>OR</td>
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<td>SE</td>
<td>OR</td>
<td>b</td>
<td>SE</td>
<td>OR</td>
</tr>
<tr>
<td>Peer victimization</td>
<td>-0.07</td>
<td>0.05</td>
<td>0.94</td>
<td>0.15</td>
<td>0.05**</td>
<td>1.16</td>
<td>0.17</td>
<td>0.09</td>
<td>1.19</td>
</tr>
<tr>
<td>Age</td>
<td>-0.08</td>
<td>0.14</td>
<td>0.92</td>
<td>-0.08</td>
<td>0.05</td>
<td>0.92</td>
<td>-0.13</td>
<td>0.04**</td>
<td>0.89</td>
</tr>
<tr>
<td>Male</td>
<td>0.63</td>
<td>0.10***</td>
<td>1.88</td>
<td>0.65</td>
<td>0.14***</td>
<td>1.92</td>
<td>0.69</td>
<td>0.13***</td>
<td>1.99</td>
</tr>
<tr>
<td>White</td>
<td>-0.26</td>
<td>0.12**</td>
<td>0.77</td>
<td>-0.26</td>
<td>0.09**</td>
<td>0.77</td>
<td>-0.25</td>
<td>0.10*</td>
<td>0.78</td>
</tr>
<tr>
<td>Personal victimization</td>
<td>0.47</td>
<td>0.11***</td>
<td>1.60</td>
<td>0.47</td>
<td>0.13***</td>
<td>1.61</td>
<td>0.45</td>
<td>0.13***</td>
<td>1.56</td>
</tr>
<tr>
<td>Violent offending (W1)</td>
<td>1.57</td>
<td>0.15***</td>
<td>4.83</td>
<td>1.60</td>
<td>0.13***</td>
<td>4.95</td>
<td>1.59</td>
<td>0.13***</td>
<td>4.88</td>
</tr>
<tr>
<td>Depression</td>
<td>0.03</td>
<td>0.01**</td>
<td>1.03</td>
<td>0.03</td>
<td>0.01**</td>
<td>1.03</td>
<td>0.03</td>
<td>0.01**</td>
<td>1.03</td>
</tr>
<tr>
<td>Deviant peers</td>
<td>0.39</td>
<td>0.20*</td>
<td>1.47</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Density</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>-0.04</td>
<td>0.14</td>
<td>0.96</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Involvement</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>0.08</td>
<td>0.01***</td>
<td>1.09</td>
</tr>
<tr>
<td>Peer Victimization × Deviant peers</td>
<td>0.28</td>
<td>0.20</td>
<td>1.32</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Peer Victimization × Density</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>-0.37</td>
<td>0.75</td>
<td>0.69</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Peer Victimization × Involvement</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>-0.02</td>
<td>0.02</td>
<td>0.98</td>
</tr>
</tbody>
</table>

| AIC                                      | 1596.38 | 1599.91 | 1589.37 |
| BIC                                      | 1652.24 | 1655.77 | 1645.23 |
| R²                                       | 0.29    | 0.28    | 0.30    |

Note: Entries are unstandardized logistic regression coefficients ($b$), odds ratios (OR), and robust standard errors (SE), Akaike (AIC), Bayesian (BIC), and McFadden’s R-square ($R^2$). 
*p < .05, **p < .01, ***p < .001 (two-tailed test).
Overall, these findings highlight both the significant relationship between violent victimization and violent offending. The mediating effect of depression was modest. There was no evidence of moderation. The focus now shifts to the implications of the results for theory, research, and practice.

**Discussion and Conclusions**

This study examined the relationship between peer victimization and violent offending. Building on prior research (see Agnew, 2002; Baron, 2009; Lin et al., 2011), this study used friendship network data to operationalize vicarious strain (i.e., peer victimization). Past research has relied on respondents’ perceptions to operationalize vicarious strain, which does not take consideration relationships or capture the level of involvement that individuals have with victims. Friendship network data provides an accurate measure of the amount of victimization taking place within a network, the cohesiveness of members within a network, and the amount of time being spent with friends. Within the GST framework, victimization is a key strain that is likely to promote maladaptive coping. The effect of victimization is not limited to those who experience trauma, but also impacts the lives of those who witness it (e.g., family, friends, peer, and others).

Agnew (2001) asserts that vicarious victimization may upset younger individuals because the people they care about have been harmed, ultimately pressuring them to cope in a delinquent manner. Vicarious strain is likely to lead to violence as people attempt to (1) prevent additional harm to those they care about, (2) seek revenge against those they believe are responsible for the harm, and (3) to alleviate negative emotions. What is lacking in the GST literature is the role deviant peers play in the coping process. Deviant
peer association is a strong predictor crime and delinquency (Hoeben et al., 2016). This study examined whether vicarious strain occurs through having friends who are victimized, and if that relationship is conditioned by deviant peers, social cohesiveness (or density), or level of involvement within a network. The findings from this research contribute to GST literature, identify avenues for future research, and provide directions for policy implications.

Agnew (1992) argues that strain increases the likelihood of negative emotions (e.g., anger and frustration). In turn, these emotions create the pressure for corrective action, with deviance being one possible solution. In support of GST’s hypothesis that strain leads to negative emotions, support was observed for hypothesis 1 as peer victimization was positively associated with depression. Also consistent with GST, peer victimization was directly associated with violent offending. Stated differently, victimization of one’s friend significantly increased personal involvement in violent offending. In short, hypothesis 2 was supported. As for hypothesis 3, the results suggest that depression only partially mediates the relationship between peer victimization and violent offending. Prior research examining the strain and crime relationship has also found evidence for partial mediation of negative emotions (see Agnew & White, 1992; Sigfusdottir, Farkas, & Silver, 2004). Perhaps the relationship between peer victimization and violent offending is affected by crime provoking emotions, such as anger and frustration.

To assess the effect of deviant peers and other network variables (i.e., density and involvement) in the coping process, their moderating effects were examined. There was no evidence of moderation. Specifically, deviant peers (H₄), density (H₅), nor
involvement \((H_6)\) moderated the relationship between peer victimization and violent offending providing no support the research hypotheses. Although that is the case, it was observed that having deviant peers and involvement with peers were positively and significantly related to violent offending. Not surprisingly, there was a strong and significant relationship between personal victimization and violence across all models, supporting the argument that physical victimization is a key strain that fosters criminal behavior (see Agnew, 2002).

This study is one of the first to test GST’s vicarious strain hypothesis using friendship network data, thus providing a foundation for future research in this area. The results indicate that vicarious strain occurs through having friends who are victimized. More specifically, the victimization of individuals’ friends is associated with depression and violent offending. Although no moderation effects were observed for deviant peers or other network variables, deviant peers is a robust predictor of crime and delinquency and may influence how individuals cope with strain. To gain a better understanding of the coping process, future studies testing key arguments of GST should incorporate deviant peers. Another avenue for future research is the use of friendship network data to test key assumptions of GST. Regarding that, relying on respondents’ perception of their friends’ victimization experiences and delinquent/criminal involvement presents two potential limitations, which are: (1) individuals may exaggerate the amount of victimization experienced by their peers, or (2) their friends’ victimization may be a reflection of their own. That said, future studies should incorporate friendship network data when testing GST.
With regards to policy implications, a focus should be placed on the cycle of violence. Since violence can be cyclical, school officials and health care providers (e.g., counselors, social workers, and psychologists) should be aware that violent victimization does not only affect the lives of those who experience trauma, but also individuals who have a relationship with the person who is victimized. For example, it was found that the victimization of friends increases personal violence. Counselors, social workers, and other health professionals should provide support for victims and close relatives and friends to help them cope with tragedies (e.g., victimization) in their everyday lives. In addition, perhaps interventions in academic and professional institutions, such as peer counseling and victim-offender mediation, could be put into practice in an effort to promote prosocial forms of coping and reduce the tendency toward deviance and retaliation.

Similar to most research, this study also has limitations. Agnew (1992, 2006) argues that negative emotions, such as anger and frustration, are likely to promote a criminal response to crime. The analysis in this study was limited in that only one form of negative emotions, specifically depression, was considered. Following Daniels and Holtfreter (2018), future research should account for other forms of negative emotions (e.g., anger, frustration, anxiety, and envy) when testing GST.
References


CHAPTER 4
LOW SOCIAL SUPPORT AND CRIME: THE CONDITIONING IMPACT OF DEVIANTE PEERS

Introduction

Social support is a concept that transcends the social sciences. Social support refers to a social network’s provision of both psychological and material resources with the intention of helping recipients cope with stress (Cohen, 2004; Lin et al., 1986). This concept is multidimensional in nature. Colvin and colleagues (2002) posit that social support can be both expressive and instrumental. Expressive (or emotional) support is described as the sharing and ventilation of emotions, coming to an understanding on issues and problems, and the affirmation of one’s own and others’ self-worth and dignity (e.g., sharing intimate feelings). Instrumental support functions may be served through the provision of material and financial assistance, the giving of advice, guidance, and connections for positive and legitimate social advancement (e.g., loaning friends money to pay bills, providing childcare assistance, or helping a friend/relative get a job). Overall, there are many ways a network can provide support to its members.

Obtaining social support is not limited to one source, but may be gained through various sources. Adolescents usually benefit from support provided by family members, peers, or others (e.g., teacher and coaches) (see Reuger, Malecki, & Demaray, 2010). Family members, especially parents, are important agents of social support. Adolescents depend on parents for emotional and instrumental support, specifically by parents’ ability to share intimate feelings, provide adequate housing, food, guidance, and advice. When adolescents lack social support from parents they may compensate by seeking support
from others. Fuligini and Eccles (1993) argue that adolescents may cope with unsatisfactory parental relationships by seeking support from peers. Peers are capable of offering adolescents emotional and social support by providing assistance that fosters a sense of belonging within the community. Academic professionals (e.g., teachers and counselors) are another source of social support (Reuger et al., 2010). For example, teachers provide support by mentoring and motivating students, assisting with assignments, and providing career guidance and counseling. Adolescents are able to benefit tremendously from the support provided by prosocial agents. In turn, social support increases the likelihood of variety of prosocial outcomes.

A wide body of literature has focused on the protective effects of social support on various outcomes among adolescent populations. Over time, studies have generally shown a positive association between perceived social support and developmental outcomes, such as academic achievement, health (e.g., eating habits, exercising, and abstinence from substance use), psychological adjustment (e.g., depression, anxiety, and happiness), the development of prosocial coping skills, career planning, self-esteem, and maladaptive behaviors (Chu, Saucier, & Hafner, 2010). Reuger and colleagues (2010) found that perceived support from various sources (i.e., parents, peers, and teachers) was related to lower depressive symptoms, lower anxiety, higher self-esteem, and better academic adjustment. Social support also influences crime-related outcomes. In fact, there is a common theme in criminology that social support prevents crime (Cullen, 1994). Studies have shown that those with higher levels of social support are less likely to offend; however, most of this research focuses on recidivism outcomes (Bales & Mears, 2008; Cochran, 2014). While studies have typically focused on the positive effects of
social support, the negative impact of social support (or lack thereof) also requires attention.

Within the field of criminology, there has been little research examining the negative effects of social support, especially on juvenile misconduct. Brezina and Azimi’s (2018) study is one of the first to deviate from the norm by investigating the “dark side” of social support. The authors found that social support derived from negative sources (i.e., deviant peers) promotes maladaptive behavior. More specifically, among adolescents who associate with deviant peers, social support was associated with an increase in offending. This research suggests that social support does not always have positive effects on adolescent well-being. Their findings set the foundation for the exploration of adverse effects of social support on deviant outcomes (e.g., crime and delinquency). What are the consequences of low social support? Studies examining the effects of poor social support have found that it is associated with a host of mental health outcomes, such as the onset and relapse of depression (Paykel, 1994) and seasonal affective disorder (Michalak, Wilkinson, Hood, Dowrick, & Wilkinson, 2003). Currently, there is a gap in literature investigating the deleterious effects of poor social support on maladaptive coping.

Low social support may serve as a strain in the lives of adolescents. Agnew’s (1992) general strain theory (GST) explains how negative relationships with others influence deviant behavior. Agnew (1992) defines strain as “relationships in which the individual is not treated as he or she wants to be treated” (p. 48). The main premise of GST is that strains and stressors increase negative emotions (e.g., anger, frustration, and depression), ultimately creating the pressure for corrective actions, such as involvement
in criminal and deviant behavior (Agnew, 1992; 2006). Relationships can be a source of support, but also a source of stress. There are three major types of strain. The first source of strain is the removal of positive stimuli. For some this source of strain refers to the loss of a close friend or the death of a relative. When a person loses someone who provided emotional or instrumental support (perceived or actual) they may experience negative emotions, and cope through involvement in criminal and deviant behavior.

The second type of strain is the failure to achieve positively valued outcomes. Social support is argued to be a desired element that individuals aspire to obtain as it is essential for maintaining physical and psychological health (Ozbay et al., 2007). While that is the case, not everyone seeks social support. Taylor and colleagues (2004) argue that individuals’ decisions to solicit and receive social support are likely to depend heavily on the nature of relationship they have with their networks. For example, those with close-knit relationships with individuals within their network may be more likely to seek support than those who are not involved in their network. Furthermore, individuals who experience mental health issues (e.g., major depression) may socially isolate themselves and be reluctant to seek out support from those within their network out of fear of being judged.

The third and final source of strain is the presentation of noxious or negatively valued stimuli. Low social support is a negative stimulus as it has the ability to blunt positive outcomes in its absence. Poor social support from prosocial agents may promote conditions where associations with deviant peers are more likely to take root and develop. Hawkins and Weis’s (1985) social development model, an integration of social control theory and social learning theory, suggests that behavior is influenced by positive
socialization with family, peers, schools and community. Decreased attachments in positive relationships with prosocial agents (e.g., parents and teachers) lead to an increase in associating with deviant peers, ultimately undermining prosocial behavior. That said, the behavior of individuals who have low social support may be exacerbated by their affiliation with deviant peers.

Deviant peers are instrumental in the facilitation of criminal and deviant behavior (Hoeben, Meldrum, Walker, & Young, 2016). More specifically, research shows that deviant peer affiliation is associated with a host of antisocial behaviors, such as delinquency (Bowman, Prelow, & Weaver, 2007; Haynie & Osgood, 2005; Vitaro, Brendgen, & Tremblay, 2000), substance use (Fergusson, Swain-Campbell, Horwood, 2002; Heinze, Toro, & Urberg, 2004), and risky sexual behaviors (Landsford et al., 2014). Although deviant peer association is a robust predictor of criminal and deviant behavior, less is known about its role in contributing to maladaptive coping outcomes among those who have low levels of social support. GST contends that deviant peers will contribute to criminal and deviant behavior among those who experience strain by (1) supplying a form of support for criminal behavior, (2) considering particular acts as a proper response to strain, and (3) acting as instigators. Agnew (2006) claims that those with deviant peers are more likely to have access to deviant coping strategies and view deviance as an attractive or appropriate response to strain. GST studies have examined the moderating impact of deviant peers on relationship between strain and maladaptive coping. Agnew and White (1992) found that deviant peers moderated the relationship strain and drug use. That is, individuals who experienced strain and associated with deviant peers reported higher levels of drug use. Mazerolle and Maahs (2000) produced
similar results. Specifically, their findings indicated that the relationship between strain and crime was conditioned by deviant peers. The current study seeks to explore the influence of deviant peers among individuals with low social support, specifically regarding their ability to promote delinquent behavior.

**Current Focus**

Over the past couple of decades, interest in the link between social support (or lack thereof) and criminal behavior has increased (Colvin, Cullen, & Ven, 2002; Cullen, 1994). While most research focuses on the positive effects of perceived social support, researchers have neglected the potential deleterious impact of poor social support. Guided by GST and using data from the National Longitudinal Study of Adolescent to Adult Health (Add Health), the current study examines the relationship between low social support and delinquency. This study seeks to address the following questions: (1) Are individuals who have poor social support more likely to experience depressive symptoms? (2) Are individuals who have lower levels of social support more likely to be involved in delinquent behavior? (3) Does depression mediate the relationship between low social support and delinquency? (4) Do deviant peers moderate the relationship between low social support and delinquency?

**Data and Methods**

This study uses data from the National Longitudinal Survey of Adolescent to Adult Health (Add Health), which was initiated in 1994. Add Health is a national representative sample of approximately 20,000 adolescents in the United States between grades 7 through 12. Data were collected from 132 schools (i.e., 80 high schools and 52 middle schools) using a stratified random sample design. Schools were stratified by
region, school size and type, urbanicity, race and ethnicity, and grade level. Information collected during the in-school survey process consists of respondents’ social and demographic characteristics, risky behaviors, criminal activities, victimization experiences, self-efficacy, health status, and education and occupation of parents. Wave I data collection concluded in 1995. To establish causal ordering, this study also uses measures from wave II. Wave II follow-up interviews were conducted between April and August 1996. Respondents in grades 7 through 11 at wave I were asked to participate at wave II, ultimately yielding a sample of 14,738 adolescents. Measures were consistent across waves.

A major benefit of the Add Health study design is that it allows researchers to access data on social networks. During both waves of data collection, individuals had the opportunity to elicit friendship nominations from school rosters. More specifically, respondents were allowed to nominate up to 10 friends within the selected schools, specifically five of their closest male and five of their closest female friends. A total of 16 schools were selected from rural and urban areas to take part in the in-home interviews. The analysis is limited to a portion of the data collected from these particular schools, these data are referred to as the “saturation sample” (n = 2,728). After excluding cases with missing data using listwise deletion, the analyses are based on interviews with 1,900 respondents.

Table 4.1 presents the descriptive statistics for the variables used in this study. Focusing mainly on the demographic characteristics (i.e., gender, age, and race/ethnicity), the sample is comprised of nearly an equal proportion of males (n = 949) and females (n = 951). The average age of respondents is 16.58 years. With regards to race and ethnicity,
approximately 53 percent of the sample is non-Hispanic white, 18 percent Latino, 14 percent Asian, 11 percent black, and the remaining 3 percent represent other races/ethnicities.

### Table 4.1
Descriptive Statistics for Study Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent Variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delinquency</td>
<td>2.83</td>
<td>4.01</td>
</tr>
<tr>
<td>Depression (wave II)</td>
<td>13.82</td>
<td>6.46</td>
</tr>
<tr>
<td><strong>Independent Variable</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low social support</td>
<td>13.90</td>
<td>3.93</td>
</tr>
<tr>
<td><strong>Intervening Variable</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression (wave I)</td>
<td>13.95</td>
<td>6.42</td>
</tr>
<tr>
<td><strong>Controls</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deviant peers</td>
<td>4.17</td>
<td>3.94</td>
</tr>
<tr>
<td>Low self-control</td>
<td>0.00</td>
<td>3.71</td>
</tr>
<tr>
<td>Male</td>
<td>0.50</td>
<td>--</td>
</tr>
<tr>
<td>Age</td>
<td>16.58</td>
<td>1.51</td>
</tr>
<tr>
<td>White</td>
<td>0.53</td>
<td>--</td>
</tr>
<tr>
<td>Latino</td>
<td>0.19</td>
<td>--</td>
</tr>
<tr>
<td>Asian</td>
<td>0.14</td>
<td>--</td>
</tr>
<tr>
<td>Black</td>
<td>0.11</td>
<td>--</td>
</tr>
<tr>
<td>Other</td>
<td>0.03</td>
<td>--</td>
</tr>
<tr>
<td>Delinquency (wave I)</td>
<td>3.92</td>
<td>4.86</td>
</tr>
</tbody>
</table>

Source: National Longitudinal Study of Adolescent to Adult Health.
Note: N = 1,900; SD = Standard Deviation.

**Measuring Low Social Support**

Previous work with the Add Health data has used a measure of social support that reflects respondents’ perceived amount of support from various sources (see Nooney, 2005; Wight, Botticello, & Aneshensel, 2006). Consistent with prior research, social support was assessed using a 7-item index, asking adolescents how much they feel that people (i.e., parents, teachers, friends, and other adults) care about them. In addition,
respondents were asked, how much they feel that “your family pays attention to you,” “your family understands you,” and “you and your family have fun together.” Items were coded as 0 (not at all) to 4 (very much). Principal components analysis confirmed that the scale is unidimensional (eigenvalue = 2.30; factor loadings > 0.30). The items were recoded so that higher values indicate lower levels of social support ($\alpha = 0.76$).

**Dependent Variable**

*Delinquency.* During wave II data collection, delinquency was captured using a 13-item additive scale representing the self-reported frequency of involvement in delinquent acts. This measure has demonstrated good internal consistency in prior research (see McGloin, 2009). Respondents were asked, in the past 12 months how often did they engage in the following acts: (1) “paint graffiti or signs on someone else’s property or in a public place”; (2) “deliberately damage property that didn’t belong to you”; (3) “lie to your parents or guardians about where you had been or whom you were with”; (4) “take something from a store without paying for it”; (5) “run away from home”; (6) “drive a car without its owner’s permission”; (7) “steal something worth more than $50”; (8) “go into a house or building to steal something”; (9) “use or threaten to use a weapon to get something from someone”; (10) “sell marijuana or other drugs”; (11) “steal something worth less than $50”; (12) “act loud, rowdy, or unruly in a public place”; and (13) “take part in a fight where a group of your friends was against another group.” The response categories for the items were 0 = never, 1 = one or two times, 2 = three or four times, and 3 = five or more times. The delinquency index was created by summing the 13 items ($\alpha = 0.81$). Higher values indicate greater involvement in delinquent activity.
Intervening Variable

**Depression.** One of the most commonly used scales by social scientists to measure depressive symptomatology in the general population is the Center for Epidemiological Studies Depression (CES-D). This scale has been deemed reliable and valid (Radloff, 1977). The current study uses a 16-item scale consisting of measures adapted from CES-D to assess respondents’ levels of depression. Respondents were asked within the past seven days how often: (1) “you were bothered by things that usually don’t bother you”; (2) “you didn’t feel like eating, or your appetite was poor”; (3) “you felt that you could not shake off the blues, even with help from your family and your friends”; (4) “you felt that you were just as good as other people”; (5) “you had trouble keeping your mind on what you were doing”; (6) “you felt depressed”; (7) “you felt hopeful about the future”; (8) “you thought your life had been a failure”; (9) “you felt fearful”; (10) “you were happy”; (11) “you talked less than usual”; (12) “you felt lonely”; (13) “people were unfriendly to you”; (14) “you enjoyed life”; (15) “you felt sad”; and (16) “you felt that people disliked you.” Responses to each question ranged from 0 (never or rarely) to 3 (most of time or all of the time). Items 4, 7, 10, and 14 were recoded so that higher values indicated greater levels of depression. A summated scale was constructed using the 16-items, with higher values reflecting greater levels of depression. The scale has high internal consistency ($\alpha = 0.84$).

Moderating Variable

**Deviant peers.** Deviant peers was assessed using the same 13-item additive scale representing the self-reported frequency of involvement in delinquent acts. For each member and the respondent’s network, the delinquency score was created by summing
the items across these 13 questions, higher values indicate greater involvement in
delinquent activity. Similar to previous research, deviant peers was measured by taking
the mean value of delinquency items for the respondent’s friendship send network (see
McGloin, 2009; McGloin & Shermer, 2009).

Control Variables

Low self-control. Similar to McGloin and Shermer (2009), low self-control was
operationalized using 6-items from wave I. More specifically, respondents were asked
how much did they agree with the following statements, during the past week: (1) “when
you have a problem to solve, one of the first things you do is get as many facts about the
problem as possible,” (2) “when you are attempting to find a solution to a problem, you
usually try to think of as many different ways to approach the problem as possible,” (3)
“when making decisions, you generally use a systematic method for judging comparing
alternatives,” and (4) “after carrying out a solution to a problem, you usually try to
analyze what went right and what went wrong” (1 = strongly agree, 2 = agree, 3 = neither
agree nor disagree, 4 = disagree, 5 = strongly disagree). The last two items asked
respondents during “getting your homework done” (0 = never to 4 = everyday), and
“paying attention in school” (0 = never to 4 = everyday). Being that the response sets
varied among the questions, the items were standardized prior to creating a summated
scale, with higher values reflecting lower levels of self-control (α = 0.68).

Age, gender, and race/ethnicity are statistically controlled for in the multivariate
analyses. Age was a continuous variable measured in years at wave II (M = 16.58, SD =
1.51). Gender was binary measure (0 = female, 1 = male). Race/ethnicity was controlled
for using a host of dummy variables Latino, Asian, Black, and Other (0 = no, 1 = yes),
with non-Hispanic White as the reference group. Respondents’ prior involvement in
delinquency and level of depression were also controlled for in the analyses using data
from wave I.

Analytic Strategy

The analysis proceeds in multiple stages. First, a test for the severity of
multicollinearity was conducted for the predictor variables, results indicated that there is
no evidence of harmful collinearity (VIF range = 1.03 to 1.35, mean VIF = 1.17). Second,
a negative binomial regression model was estimated assessing the relationship between
low social support and depression. Third, a series of negative binomial regression models
was estimated examining the relationship between low social support and delinquency.
This particular statistical model is warranted due to the overdispersion in the depression
(mean = 13.82, variance = 41.69) and delinquency (mean = 2.83, variance = 16.11)
measures. Fourth, to assess whether the relationship between low social support and
delinquency is dependent on deviant peers, the interaction effect of deviant peers is
estimated. Both variables were mean-centered prior to creating the interaction term to
alleviate problems associated with multicollinearity (Aiken & West, 1991). Lastly, to
check for heteroscedasticity in the negative binomial regression models, the Bruesch-
Pagan test was used. There was evidence of heteroscedasticity; therefore, robust standard
errors are estimated. All analyses were estimated in STATA 13 (StataCorp, College
Station, TX).

Results

Agnew’s (1992) GST holds that negative emotions result from strain (or stressful
situations). To test this argument, Table 4.2 presents a negative binomial regression
examining the relationship between low social support and depression, net of control variables. In support of GST, the results indicate that low social support is a significant predictor of depression \((b = 0.01, p < .001)\). Regarding the control variables, Latino \((b = 0.07, p < .001)\), Asian \((b = 0.15, p < .001)\), and prior depression \((b = 0.03, p < .001)\) were all positively associated with depressive symptomatology, while males were less likely to experience depression \((b = -0.03, p < .05)\).

Table 4.2
Effect of Low Social Support on Depression \((N = 1,900)\)

<table>
<thead>
<tr>
<th>Variable</th>
<th>(b)</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Social Support</td>
<td>0.014</td>
<td>0.00*</td>
</tr>
<tr>
<td>Deviant Peers</td>
<td>0.002</td>
<td>0.00</td>
</tr>
<tr>
<td>Low Self-Control</td>
<td>0.003</td>
<td>0.00</td>
</tr>
<tr>
<td>Male</td>
<td>-0.031</td>
<td>0.01*</td>
</tr>
<tr>
<td>Age</td>
<td>0.004</td>
<td>0.01</td>
</tr>
<tr>
<td>Latino</td>
<td>0.068</td>
<td>0.01***</td>
</tr>
<tr>
<td>Asian</td>
<td>0.151</td>
<td>0.02***</td>
</tr>
<tr>
<td>Black</td>
<td>0.041</td>
<td>0.03</td>
</tr>
<tr>
<td>Other</td>
<td>0.012</td>
<td>0.10</td>
</tr>
<tr>
<td>Depression (wave I)</td>
<td>0.033</td>
<td>0.00***</td>
</tr>
</tbody>
</table>

| LR test of \(\alpha=0\) | 518.83***|
| Wald \(\chi^2\)         | 6791.13***|
| McFadden \(R^2\)        | 0.07     |

Note: LR = likelihood ratio chi-square statistic; SE = robust standard errors; \(b\) = negative binomial regression coefficients. 
* \(p < .05\), ** \(p < .01\), *** \(p < .001\) (two-tailed test).

Turning to model 1 in Table 4.3, this negative binomial regression model examines whether low social support is associated with delinquency. The effect of low social support is positive and significant \((b = 0.03, p < .01)\). In other words, compared to those with higher levels of social support, individuals who reported lower levels of social support were more likely to report higher levels of self-reported delinquency. As expected, in line with previous research (see Hoeben et al., 2016), those who associate
with deviant peers are more likely to engage in delinquency. Next, consistent with Gottfredson and Hirschi’s (1990) theory, the results show that low self-control is a significant predictor of delinquency. Individuals who report prior delinquent involvement were likely to engage in future delinquent behaviors. Lastly, model 1 also shows that involvement in delinquency decreases with age. This finding is consistent with prior research (see Hirschi and Gottfredson, 1983).

According to GST, negative emotions should explain (or mediate) the relationship between strain and crime. Model 2 in Table 4.3 tests this hypothesis. In model 2, depression is added to the equation. There is a positive and significant relationship between depression and delinquency ($b =0.01, p < .05$). That is, individuals with higher levels of depressive symptoms were more likely to engage in delinquency. Importantly, the relationship between low social support and delinquency is no longer significant. This finding is consistent with GST as it supports the theoretical argument that negative emotions account for the strain-crime link.
## Table 4.3
Effect of Low Social Support and Depression on Delinquency ($N = 1,900$)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th></th>
<th>Model 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$b$</td>
<td>SE</td>
<td>$b$</td>
<td>SE</td>
</tr>
<tr>
<td>Low Social Support</td>
<td>0.034</td>
<td>0.01**</td>
<td>0.026</td>
<td>0.01</td>
</tr>
<tr>
<td>Deviant Peers</td>
<td>0.031</td>
<td>0.01***</td>
<td>0.030</td>
<td>0.00***</td>
</tr>
<tr>
<td>Low Self-Control</td>
<td>0.011</td>
<td>0.00*</td>
<td>0.008</td>
<td>0.00</td>
</tr>
<tr>
<td>Male</td>
<td>0.094</td>
<td>0.05</td>
<td>0.130</td>
<td>0.06*</td>
</tr>
<tr>
<td>Age</td>
<td>-0.110</td>
<td>0.01***</td>
<td>-0.117</td>
<td>0.02***</td>
</tr>
<tr>
<td>Latino</td>
<td>-0.017</td>
<td>0.08</td>
<td>-0.057</td>
<td>0.09</td>
</tr>
<tr>
<td>Asian</td>
<td>0.161</td>
<td>0.06**</td>
<td>0.010</td>
<td>0.04*</td>
</tr>
<tr>
<td>Black</td>
<td>0.126</td>
<td>0.11</td>
<td>0.116</td>
<td>0.11</td>
</tr>
<tr>
<td>Other</td>
<td>-0.037</td>
<td>0.11</td>
<td>-0.038</td>
<td>0.11</td>
</tr>
<tr>
<td>Delinquency (wave I)</td>
<td>0.110</td>
<td>0.01***</td>
<td>0.109</td>
<td>0.01***</td>
</tr>
<tr>
<td>Depression (wave I)</td>
<td>--</td>
<td>--</td>
<td>0.015</td>
<td>0.01*</td>
</tr>
</tbody>
</table>

| LR test of $\alpha=0$   | 2094.07*** | 2065.10*** |
| Wald $\chi^2$           | 6023.03*** | 8387.17*** |
| McFadden R$^2$          | 0.06      | 0.07     |

Note: LR = likelihood ratio chi-square statistic; SE = robust standard errors; $b =$ negative binomial regression coefficients.

* $p < .05$, ** $p < .01$, *** $p < .001$ (two-tailed test).
Table 4.4 presents a negative binomial regression examining whether deviant peers moderate the relationship between low social support and delinquency. No moderating effect was detected. While that is the case, deviant peers, prior delinquency, and depression remained significant predictors of delinquency.
Table 4.4
Moderating Effect of Low Social Support and Deviant Peers on Delinquency ($N = 1,900$)

<table>
<thead>
<tr>
<th>Variable</th>
<th>$b$</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Social Support</td>
<td>0.027</td>
<td>0.01</td>
</tr>
<tr>
<td>Deviant Peers</td>
<td>0.031</td>
<td>0.00***</td>
</tr>
<tr>
<td>Low Self-Control</td>
<td>0.007</td>
<td>0.00</td>
</tr>
<tr>
<td>Male</td>
<td>0.132</td>
<td>0.06*</td>
</tr>
<tr>
<td>Age</td>
<td>-0.117</td>
<td>0.02***</td>
</tr>
<tr>
<td>Latino</td>
<td>-0.053</td>
<td>0.10</td>
</tr>
<tr>
<td>Asian</td>
<td>0.087</td>
<td>0.04*</td>
</tr>
<tr>
<td>Black</td>
<td>0.119</td>
<td>0.11</td>
</tr>
<tr>
<td>Other</td>
<td>-0.042</td>
<td>0.11</td>
</tr>
<tr>
<td>Delinquency (wave I)</td>
<td>0.109</td>
<td>0.01***</td>
</tr>
<tr>
<td>Depression (wave I)</td>
<td>0.015</td>
<td>0.01*</td>
</tr>
<tr>
<td>Low Social Support $\times$ Deviant Peers</td>
<td>-0.002</td>
<td>0.00</td>
</tr>
</tbody>
</table>

LR test of $\alpha=0$ 554.54***
Wald $\chi^2$ 8804.18***
McFadden R$^2$ 0.07

Note: LR = likelihood ratio chi-square statistic; SE = robust standard errors; $b$ = negative binomial regression coefficients.
*p < .05, **p < .01, ***p < .001 (two-tailed test).
In sum, these findings highlight both the significant relationships between low social support and depression, and low social support and delinquency. Equally important is the mediating impact of depression on the strain-crime link. Contrary to expectations, there was no evidence of moderation. The attention now shifts to the implications of the results for theory, research, and practice.

**Discussion and Conclusions**

This study investigated the relationship between low social support and crime. In the past, studies have explored the positive effects of social support on well-being outcomes (see Chu et al., 2010), while rarely investigating its “dark side” (see Brezina & Azimi, 2018). There is a common theme in criminology that social support prevents crime (Cullen, 1994). More specifically, when social support is derived from prosocial sources (e.g., family, peers, and other adults), social support reduces the risk of negative behavioral and health outcomes. Despite that, under certain conditions social support promotes delinquency, especially when it is derived from deviant peers (see Brezina & Azimi, 2018). This study builds on the social support literature by examining the deleterious effects of low social support on delinquency. In line with Agnew’s (1992) GST, which posits that strains trigger negative emotions and ultimately deviant coping, it is argued that low social support is a strain that promotes maladaptive coping. Overall, the findings, which are briefly summarized below, highlight the importance of considering the low social support as a strain.

There are three major findings that emerge from this research. First, this study revealed that low social support is associated with depression. Stated differently, individuals with low social support were likely to report higher levels of depression. This
finding is consistent with GST’s hypothesis that strain causes negative emotions (e.g., anger, frustration, and depression). Agnew (2006) argues that strain pressures individuals into crime; specifically, individuals who experience strain are likely to cope maladaptively. With the assumption that low social support is a strain, the results showed that low social support is positively and significantly associated with delinquent behavior. Put differently, individuals who have low social support are likely to engage in delinquency. The study’s third research question focused on GST’s proposition that negative emotions mediate the relationship between strain and crime. In support of GST, the results indicated that depression fully mediates the relationship between low social support and delinquency, meaning that depression explains the relationship between low social support and delinquency. Finally, the potential conditional effect of deviant peers was tested; however, no evidence of moderation was observed. Next, a discussion is provided regarding the implications for theory, future research, and policy implications based on the study’s findings.

GST has traditionally focused on negative relationships with others, specifically relationships where others do not treat the individual as he or she desires (Agnew, 1992). This implies that relationships may be either a source of support or a source of strain. Agnew identifies three categories of strain, specifically the loss of positive stimuli, failure to achieve positively valued goals, and the presentation of negative stimuli. A major strength of GST is its broad scope with the specification of these categories of strain. However, this strength is also GST’s greatest weakness making it virtually unfalsifiable. GST is so broad, providing researchers with little guidance on strains to examine in their research. Many strains fall within these major sources of strain (see Agnew, 2001). The
current study argues that low social support is a strain as it is the representation of negative stimuli. The results from the current study are consistent with GST in that low social support is a predictor of depression and delinquency. Furthermore, the relationship between low social support and delinquency was mediated by depression. This exploration of nontraditional strain (i.e., low social support) is a fruitful path for future GST research.

The consideration of unconventional strains can potentially advance GST research. Many studies have examined victimization as a strain (see Hay & Evans, 2006; Hay & Meldrum, 2010; Patchin & Hinduja, 2011). Walker and Holtfreter’s (2016) study is one of few that have attempted to explore unconventional strain by looking at the relationship between adolescent motherhood and delinquency. Moreover, scholars have also examined other nontraditional strains, such as unemployment (Baron, 2008) and discrimination (Eitle, 2002). A major benefit of exploring these types of strain is that it expands the understanding of crime causation. Some other examples of unconventional stressors could be considered in future GST studies are personal health issues (e.g., injuries or illnesses), financial difficulties (e.g., debt and unemployment), marital issues (e.g., divorce), and negative life events (e.g., incarceration of relative/friend). Another avenue for future research is to consider other forms of negative emotions when examining the relationship between low social support and crime/delinquency. Due to the limitations of the data, test on the effect of low social support on other negative emotions, such as anger and frustration were not possible (see Daniels & Holtfreter, 2018). Nevertheless, the findings from this study have important policy implications.
Based on the findings from this research, a couple of policy implications emerge. First, there is a need for school-based support programs that provide adolescents with poor social support access to mental health services. Ideally, therapists or social workers would contribute to adolescents’ well-being by providing access to prevention programming, early intervention services (e.g., skill groups to cope with grief, anger, anxiety, and depression), and treatment options if necessary (e.g., medication) (see Green et al., 2013). The second policy implication is the implementation of programming within schools that promotes healthy relationships between adolescents and peers, such as Peer Conflict Mediation and peer mentoring programs. Peer Conflict Mediation may increase adolescents’ confidence, self-esteem, self-control, and promote peace and cooperation as it allows adolescents to work with each other to resolve personal issues (see Smith, Daunic, Miller, & Robinson, 2002). Peer mentoring programs may be beneficial as it provides adolescents with guidance, support, and prosocial role models. These types of programs may also increase social cohesion and reduce suspensions at academic institutions (Johnson & Johnson, 1996).

In conclusion, studies have neglected to examine the harmful effects of low social support. This study advances GST research by conceptualizing low social support as a strain in adolescents’ lives. The results provide evidence to support this claim.
References


CHAPTER 5
DISCUSSION

In the late 19th century, the field of criminology began to emerge to explain why individuals commit crimes. Sutherland (1947) defined criminology as a body of knowledge regarding crime as a social phenomenon. Included within its scope are the causes of crime and the response to it. For those reasons, several theories have been formulated identifying correlates of crime and deviance, and recommending policy for the effective prevention and suppression of crime. Today, criminology is a multidisciplinary field that incorporates social and psychological concepts to understand crime and deviant behavior. One theory in particular that reflects the interdisciplinary nature of criminology is Agnew’s (1992) general strain theory (GST).

GST incorporates key psychological components (i.e., stress and negative affect) in an effort to understand criminal behavior. The main premise of GST is that life stressors generate negative emotions, such as anger, depression, and frustration, ultimately pressuring individuals into crime (Agnew, 2006). Agnew describes strain as negative relations with others. According to GST, there are three sources of strain: (1) the presentation of negative stimuli, (2) the failure to achieve positively valued goals, and (3) the removal of positive stimuli. Moreover, strain may be experienced, vicarious, or anticipated (see Agnew 2002). In spite of GST’s empirical support over the past several years, similar to nearly all theories of crime causation, GST has its strengths and weaknesses. One of GST’s main strengths is its wide scope. Specifically, various stressors may fall into the three categories of strain suggested by GST. The theory’s broad nature is also a potential weakness. GST lacks clear guidance for providing
researchers with an exhaustive list of strains to examine in their research. As a result, there is a lack of research investigating the impact of unconventional strains (e.g., teenage pregnancy and low social support) on criminal behavior. Moreover, there is also a shortage of research exploring whether deviant peers contribute to the criminal behavior of those who experience strain.

In light of these gaps, one goal of this dissertation was to incorporate the role of deviant peers in the GST tradition. This dissertation used two sources of data from the National Longitudinal Survey of Adolescent to Adult health (Add Health) to examine the primary research question: Do deviant peers moderate the relationship between strain and negative outcomes? To fulfill the purpose of the dissertation three empirical studies were conducted. The first study assessed the relationship between teenage pregnancy (strain), depression, and substance use behaviors. The second investigated whether the victimization of a friend (strain) increases violent offending. The third and final study of the dissertation examined the relationship between low social support (strain) and delinquency. The remainder of this chapter discusses key findings, their practical implications, directions for future research, and some concluding thoughts on the importance of incorporating deviant peers and unconventional strains into tests of GST.

**Summary of Findings**

The primary objective of study one was to investigate whether teenage pregnancy was a strain conducive to maladaptive coping in the form of substance use involvement. There are several aversive consequences of teenage pregnancy documented in the literature. For example, teenage pregnancy is associated with stigmatization, social isolation, abuse, and lower educational attainment (see Weimann et al., 2005). Thus, one
can rightly argue that teenage pregnancy is a strain. According to GST, strain produces negative emotions (Agnew, 1992). Therefore, the first task was to investigate the relationship between teenage pregnancy and depression. Teenage pregnancy was indeed associated with depression. Stated differently, adolescents who had experienced pregnancy were more likely to experience depressive symptoms. Considering that Agnew (2006) argues that individuals are pressured into crime, the direct relationship between teenage pregnancy and substance use outcomes were also examined. Results revealed that teenage pregnancy was positively associated with alcohol problems, marijuana use, and hard drug use, providing further evidence for the argument that teenage pregnancy is a strain. A main focus of this dissertation was to examine the role of deviant peers in the coping process, specifically whether deviant peers moderate the relationship between strain and maladaptive behavior. To assess this relationship, a three-way interaction term (Teenage Pregnancy × Depression × Deviant Peers) was created. The findings indicated that female adolescents who experienced teenage pregnancy, depression, and associated with deviant peers were likely to report higher levels of alcohol problems and marijuana use. This implies that deviant peers contribute to the coping process among females who experience teenage pregnancy. In sum, based on these findings it can be concluded that teenage pregnancy is a strain conducive to substance use behaviors, which is in line with GST predictions.

Agnew (2002) argues that vicarious strain impacts delinquent involvement. In other words, the real-life strains experienced by others affect personal behavior. The second study of this dissertation applied a longitudinal design and used friendship network data to test this argument. More specifically, the purpose of this study was to
investigate the relationship between peer victimization and violent offending. After analyzing friendship network data, results confirmed that vicarious strain occurs through having friends who are victimized. Moreover, consistent with GST’s proposition that strain triggers negative emotions, peer victimization was positively and significantly associated with depression. Next, the direct relationship between peer victimization and violent offending was assessed. In further support of GST’s vicarious strain hypothesis (see Agnew, 2002), findings indicated that the victimization of respondents’ friends was positively related to involvement in violent offending. However, the relationship between peer victimization and violent offending was only partially mediated by depression. Regarding the role of deviant peers in the coping process, no evidence of moderation was detected. In short, vicarious strain occurs through having friends who are victimized. This provides partial support for GST.

Study three of this dissertation contributed to GST research by exploring the relationship between low social support and delinquency. An overwhelming amount of literature has focused on the protective effects of social support (Chu et al., 2010). However, researchers have neglected to investigate the harmful effects of low social support. With the assumption that low social support is a strain, study three deviated from the norm as it examined the relationship between low social support and delinquency. Several key findings emerged from the multivariate analyses. First, consistent with GST’s assertion that strain leads to negative emotions, findings demonstrated that low social support was a significant predictor of depression. Second, the results indicated that there was a positive relationship between low social support and delinquency. Stated differently, as individuals’ levels of support decreased, their involvement in delinquency
increased. However, the relationship between low social support and delinquency was fully mediated by depression, thus lending further support to GST. The conditioning effect of deviant peers was also examined. However, no evidence was observed to support the hypothesis that deviant peers elevate delinquent involvement among individuals who experience strain in the form of low social support. Overall, findings from this study suggest that low social support is a strain that negatively impacts adolescents’ well-being, specifically by increasing depression symptoms and involvement in delinquency.

Taken altogether, the results from these three empirical studies support GST’s main argument that strain leads to negative emotions, and ultimately deviant and criminal behavior. More specifically, teenage pregnancy, peer victimization, and low social support are all strains that negatively impact individuals’ emotions (i.e., depression) and result in maladaptive coping. The next section of this chapter discusses the practical implications of these findings.

**Implications for Practice**

Based on the findings discussed above, several practical implications can be identified. Across all three studies, strain was a consistent predictor of depression. This consistent finding implies that adolescents are in need of assistance with managing their emotions after experiencing stressful situations. Toward that end, the first practical implication suggests a need for assistance from educational and healthcare professionals in helping adolescents cope with life challenges. Furthermore, educational institutions should provide students with mental health services in an effort to prevent or treat symptoms of negative emotionality. Research shows that school-based mental health
services are beneficial as they permit early detection of problematic issues, and usually provide cost effective treatment to students (see Evans, 1999). Rones and Hoagwood (2000) conducted an evaluation of school-based mental health services programs. Their findings indicated that a significant number of programs have positively impacted adolescents’ emotional and behavioral problems. Although school-based mental health programs and services have been shown to be effective in improving well-being outcomes (e.g., emotional and behavioral problems), in extreme cases, collaboration with outside health professionals (e.g., psychiatrists, therapists, and social workers) may be necessary to help adolescents cope with strain.

Healthy coping and managing stress are important in preventing criminal and deviant behaviors. Findings from this dissertation indicate that strain is associated with a variety of negative outcomes (e.g., substance use, violent offending, and delinquency). This leads to the second practical implication of the findings concerning the prevention of criminal and deviant behavior among those who experience strain. More specifically, programs and courses should be designed and implemented in educational institutions that promote the development prosocial coping skills, improve conflict resolution, and teach students how to gain access to coping resources for stress. Findings from a meta-analysis on school programs targeting stress management in adolescents found that such programs are effective in reducing stress symptoms and improving coping skills (see Kraag, Zeegers, Kok, Hosman, & Abu-Saad, 2006). Moreover, social and emotional learning (SEL) programs have also been shown to be effective in improving well-being outcomes (e.g., academic performance, behavioral problems, and emotional skills) of children (see Durlak et al., 2011). Elias and colleagues (1997) describe SEL as the
process of obtaining core competencies to recognize and regulate emotions, set and achieve positive goals, value the perspectives of others, establish and maintain positive relationships, make responsible decisions, and constructively handle interpersonal situations. In general, findings from stress management programs have been shown to be effective in improving adolescents’ well-being. As students become aware of prosocial coping strategies, problem solving techniques, and the resources available to them, they may be less likely to respond to strain in a maladaptive manner.

Adolescence can be a difficult time for youth as they are transitioning into young adulthood. That said, the support from prosocial others is a key element for managing stressful situations. Adolescents may benefit from support provided by parents, peers, and other adults (e.g., teachers, coaches, and counselors; see Reuger, Malecki, & DeMaray, 2010). Dornbusch and colleagues’ (2001) study found that strong family relations and school attachment were significant predictors of lower levels of deviant behavior. Accordingly, a third practical implication from this study is the need for school-community programs that bridge the gap between school and community. An ideal program would provide individuals and their families with group counseling and academic assistance, along with social and health services. Such a focus could ultimately improve educational outcomes for children, such as increased academic engagement and involvement in prosocial activities, and simultaneously reduce truancy, suspensions, and expulsions. Highlighted above are the broad practical implications of the findings from this dissertation. Next, practical implications for each individual study will be briefly discussed.
Practical Implications: Teenage Pregnancy and Substance Use

Study one found that teenage pregnancy increased depressive symptoms and substance use among adolescent females. Findings from this study also suggested that females who became pregnant in their teens, were depressed, and associated with deviant peers were more likely to suffer from alcohol related problems and use marijuana. In an effort to reduce the risk of teenage pregnancy, there is a need for the implementation of school-based teenage pregnancy prevention programs. These programs have been shown to reduce the rate of teenage pregnancy by encouraging abstinence, educating adolescents on birth control, and teaching skills to cope with peer pressure (see Bennett & Assefi, 2005). In further support of school-based teenage pregnancy prevention programs, Hoyt and Broom (2002) highlighted several programs that were effective in reducing teenage pregnancy (e.g., Postponing Sexual Involvement, Project Taking Charge, Reducing the Risk, and Safer Choices). Recognizing the benefits of pregnancy prevention programs, the federal government has also taken interest and has invested in such programs.

In 2010, the U.S. Department of Health and Human Services (HHS) launched a Teen Pregnancy Prevention Initiative, which is comprised of several programs targeting groups with high teen pregnancy rates. According to a recent report released from HHS’s Office of Adolescent Health, programs were effective in reducing the occurrence of teenage pregnancy. One program in particular that has been effective is POWER Through Choices (PTC). PTC is a compressive and innovative sexuality education program designed to reduce teenage pregnancy, HIV, and sexually transmitted infections (STI) among adolescents living in foster care, juvenile justice facilities, and other out-of-home
care settings. PTC is a 5 to 10 week program consisting of ten 90-minute sessions, which incorporates interactive skill-building activities that emphasize self-empowerment and the impact of choices. Evidence suggests that female adolescents who participated in the program were significantly less likely to report ever being pregnant or getting someone pregnant than non-participants. In addition to these types of programs, assistance from health professionals in the school environment may be needed to reduce teenage pregnancies, and to help youth cope with this stressful event.

School-based health clinics should also be considered in the effort to address teenage pregnancy. Strunk’s (2008) study found that these particular clinics had a positive effect on the educational success of pregnant and parenting teens (e.g., absenteeism and dropout rates), risky sexual behavior, and decisions to use contraceptives. School-based health clinics may provide adolescents with support and guidance designed to buffer against negative outcomes associated with teenage pregnancy. Moreover, school nursing staff are instrumental in this process, providing services such as educational support, counseling, health care, health teaching, and community resources. Such programs should supply students with complimentary birth control supplies (e.g., condoms) to reduce the risk of teenage pregnancy. Although school-based health clinics have shown to be effective, there is a continued need for support from nonprofits (e.g., Planned Parenthood) that provide affordable sexual healthcare and assistance to families.

Realistically, there will still be instances of teenage pregnancy despite prevention efforts. Therefore, based on the findings from the study, surrounding adolescents who experience pregnancy with prosocial others is important. For example, counseling and
support groups may help reduce the harmful effects of teenage pregnancy by providing adolescents the opportunity to share personal feelings, and discuss healthy options for coping with their situation and the negative emotions it may create.

Practical Implications: Peer Victimization and Violent Offending

Results from this dissertation suggest that adolescents are affected by their friends’ victimization experiences. Put simply, peer victimization is associated with depression and violent offending. Managing stress is important when attempting to reduce the tendency towards deviance and retaliation. Therefore, interventions such as mentoring and victim-offender mediation in educational institutions may be helpful in alleviating stress resulting from peer victimization.

Mentors may prove useful in providing support and guidance for adolescents as they attempt to overcome challenges in life. Mentoring has been shown to improve behavioral, attitudinal, health-related, relational, motivational, and educational/career outcomes (see Eby et al., 2008; Dubois, Portillo, & Rhodes, 2011). Findings from Tolan and colleagues’ (2014) meta-analytic review of mentoring programs suggest that these programs are effective in reducing delinquency and associated outcomes (i.e., aggression, drug use, and academic functioning) for at risk youth. For example, more programs similar to Big Brothers Big Sisters of America, which provides adolescents who are facing adversity with positive, strong, and professional mentors, are needed to help children and teens cope with life challenges. Providing mentoring services for adolescents who are vicariously affected by victimization is highly recommended in an effort to reduce criminal and deviant outcomes.
Victim-offender mediation is another practical strategy that may be helpful in alleviating the negative effects associated with vicarious strain. Victim-offender mediation has been shown to reduce delinquency (Nugent, Umbreit, Wiinamaki, & Paddock, 2001) and juvenile offender recidivism (Bradshaw, Rosenborough, & Umbreit, 2006). Traditionally, to resolve conflicts, victim-offender mediation sessions have been limited to a meeting between the victim, offender, and trained mediator. Perhaps including close relatives and friends in the process may also be beneficial, as they are also affected by such tragedies. That said, academic professionals and practitioners (e.g., social workers, therapists, and counselors) should be aware of the contagious effects of victimization and provide support to adolescents who experience vicarious strain in an effort to break the cycle of violence and reduce involvement in violent offending.

Practical Implications: Low Social Support and Delinquency

Findings from study three show that low social support acts as a strain, consistent with GST. Individuals with low social support are likely to experience depression and engage in delinquency. While that is the case, the relationship between low social support and delinquency was fully mediated by depression. There are a couple of key practical implications that have emerged from these findings. First, peer mentoring programs may potentially reduce the harmful effects associated with low social support. These particular programs provide students with guidance, support, and access to positive role models. Peer mentoring programs have shown a positive impact on school and peer attachment, feelings of competency and self-efficacy, academic performance, and prosocial behavior and attitudes (Karcher, 2008). While the benefits of these programs are noteworthy, the provision of support is not limited to peers, but must include adults as well. That said,
academic and other healthcare professionals should be aware of the struggles of adolescents and provide support through mentoring, and counseling. They can also help teens identify sources of aid in the form of welfare and other resources. Moreover, the continued support from government programs (e.g., Medicaid and Children’s Health Insurance Program) is recommended to help families cope with the everyday struggles of life. Providing health insurance is necessary to alleviate financial strain associated with treatment for mental health and other medical related issues.

The second practical implication of the study’s findings is the increased use of mental health assessments for those who lack support. Results indicated that depression mediated (or explained) the relationship between low social support and delinquency. In light of this finding and with the goal of reducing criminality in mind, mental health assessments should be conducted to identify conditions that require specialized treatment services. Individuals who lack social support cannot rely on family and friends for help; therefore, assistance from healthcare professionals may be beneficial in reducing the negative effects of strain through counseling and therapy. Early detection and treatment of mental health issues may reduce involvement in criminal and deviant behavior.

To summarize, coping with stress is inevitable. However, the way in which individuals cope with stressful situations depends on their available resources. This research calls for a collaborative effort from families, academic personnel, and health professionals to improve adolescents’ well-being outcomes after encountering strain.

**Directions for Future Research**

The findings from this dissertation contribute to the existing literature on GST, and reveal opportunities for future research. Similar to previous research (see Eitle, 2002;
Baron, 2008; Walker & Holtfreter, 2016), this dissertation investigated unconventional strains (i.e., teenage pregnancy and low social support). GST is broad in scope, thus allowing researchers to explore a variety of stressful life events. Future studies should contribute to the GST literature by examining other unconventional strains, such as personal health issues (e.g., injuries and illnesses), financial difficulties (e.g., debt and unemployment), marital problems (e.g., divorce and domestic violence), academic problems (e.g., failing grades), and negative life events (e.g., legal troubles and discrimination). Investigation of such strains will advance the GST tradition in the study of crime causation.

Negative emotions are a critical component of GST. According to GST, anger is a critical emotion in the process leading to crime and delinquency (Agnew, 1992). Due to the secondary nature of the Add Health data, this dissertation was only able to incorporate respondents’ depressive symptoms. That said, consistent with previous research (see Daniels & Holtfreter, 2018), another avenue for future study is to test the effect of strain on other negative emotions (e.g., anger, frustration, and anxiety). Arguably, anger would have a stronger impact on deviant coping, especially violence (see Mazerolle et al., 2000; Maschi & Bradley, 2008; Simons et al., 2006). With that said, the negative effects of strain are not limited to adolescence, but may be evident in adulthood as well.

There is a potential for strain to have long-lasting effects on individuals’ lives. Therefore, future research should examine the effects of various strains on criminal and deviant behavior over the life course. For example, teenage pregnancy may have detrimental effects on subsequent outcomes later in life, such as educational attainment,
employment possibilities, health, and other social outcomes. Research shows that experienced victimization impacts individuals’ behavior over the life course. For example, Turanovic (2015) found that adolescent victimization was associated with a host of negative well-being outcomes, such as depression, low self-esteem, substance use, risky sexual behavior, and crime. While we know the detrimental effects of experienced victimization, less is known about the lasting effects of vicarious victimization. The effect of witnessing a traumatic event (e.g., seeing someone get shot or stabbed) in adolescence on personal deviance in adulthood is understudied. Does witnessing domestic violence (or other forms of violence) during adolescence have an effect on personal deviance in adulthood? Taken altogether, exploring the lasting effects of strain is a fruitful path for future GST research.

Lastly, deviant peers did not play as salient of role as anticipated. Deviant peers influenced the substance use behavior of females who experienced pregnancy and who were depressed. However, there was no indication of deviant peer influence on the behavior of individuals who experienced vicarious strain (i.e., peer victimization) or had low social support. The effect of deviant peers within a GST framework is still worthy of investigating, especially in concert with other unexplored strains and emotions. For example, deviant peers may matter more for certain types of strain than others, or for those who are angry. These questions should be further examined in future tests of GST.

**Conclusion**

While there is a large body of research in support of GST, there are still gaps in literature exploring unconventional strains, and in the understanding of factors that may influence the coping process (i.e., the role of deviant peers). GST is broad in scope,
allowing for the investigation of various life stressors. Previous GST studies have failed to consider nontraditional strains, such as teenage pregnancy and low social support. The empirical findings from this dissertation have begun to fill some of the voids in the GST literature by not only investigating unconventional strains, but also assessing the role of deviant peers. Findings suggest that deviant peers matter most for those who experienced teenage pregnancy and are depressed. However, deviant peers did not have an effect on those who had friends who were violently victimized or individuals who were low in social support. Consistent with GST, teenage pregnancy, peer victimization, and low social support are strains that trigger negative emotions (i.e., depression) and are conducive to maladaptive coping in the form of substance abuse, crime, and deviance. Although this dissertation contributes to GST research, more empirical investigations are needed to advance knowledge on the coping process.
References


