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ABSTRACT

THE ROLE OF VIOLENT VICTIMIZATION IN JUVENILE DELINQUENCY AND SUBSTANCE
DEPENDENCE: EXAMINING THE MEDIATING EFFECTS OF POST-TRAUMATIC STRESS DISORDER

BY

YEOJU PARK

June 29, 2015

Committee Chair: Dr. Mark Reed

Major Department: Criminal Justice and Criminology

To explain delinquency, General Strain Theory (GST) focuses on negative relationships with others. As one type of victimization, exposure to violence is significantly related to juvenile crime and substance abuse. In addition, victimized adolescents commonly experience post-traumatic stress disorder (PTSD). However, little research has investigated the mediating role of PTSD in the association between violent victimization and juvenile delinquency.

Using data from the National Survey of Adolescents (1995), the present study examines the direct effects of sexual assault, physical assault, and witnessing violence on inner- (alcohol and illicit drug use) and outer-directed behaviors (property and violent crime). This study also examines the mediating role of PTSD, based on an overall scale of PTSD as well as the individual components of PTSD (re-experiencing, avoidance/numbing, and hyperarousal). Logistic regression analyses and the Sobel test were used to examine the hypotheses.

Findings in the study provide support for the proposition of GST that violent victimization increases the risk of juvenile crime and substance use. Findings also indicate that exposure to violence results in a higher probability of exhibiting PTSD symptoms. Finally, PTSD

clusters partially mediate the link between violent victimization and outer-directed responses. However, the expected mediating effect between violent victimization and inner-directed responses was not found. Theoretical implications and limitations are discussed.

Keywords: violent victimization, PTSD, juvenile crime, substance use

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DEPENDENCE: EXAMINING THE MEDIATING EFFECTS OF POST-TRAUMATIC STRESS DISORDER

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YEOJU PARK

A Thesis Submitted in Partial Fulfillment
of the Requirements for the Degree
of
Master of Science
in the
Andrew Young School of Policy Studies
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ACCEPTANCE

This thesis was prepared under the direction of the candidate's Thesis Committee. It has been approved and accepted by all members of that committee, and it has been accepted in partial fulfillment of the requirements for the degree of Master of Science in Criminal Justice in the Andrew Young School of Policy Studies of Georgia State University.

Thesis Chair:	Dr. Mark Reed
Committee:	Dr. Timothy Brezina Dr. Volkan Topalli

Electronic Version Approved:

Mary Beth Walker, Dean
Andrew Young School of Policy Studies
Georgia State University
August, 2015

DEDICATION

Sun, thanks for always being there for me.

I would also like to extend my deepest gratitude to my family for always believing in me.

This work cannot be completed without their love and encouragement.

I take this opportunity to express sincere gratitude to all of the Department faculty members for their help and support.

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Chapter I

Introduction

Juvenile delinquency and substance use has been of national concern over the past several decades. With the rise of juvenile violence in the 1980's, the official data shows that the juvenile arrest rates for most crimes, including violent and property crimes, have decreased substantially since the early 1990's (Snyder, 2006). Despite the decreasing trends in juvenile arrest rates, juvenile crime is still a problem, and studies report that adolescents are at risk of engaging in crimes in the future, based on their prior exposure to violence. Koppel (1987) estimated that about 83 percent of adolescents would be violently victimized in their lifetime. In reality, his estimation turned out to be quite true: more than 90 percent of detained adolescents experienced traumatic events (Becker & Kerig, 2011; Hawke et al., 2009), and as many as two out of every three adolescents report exposure to psychological trauma (Copeland et al., 2007). Recent research reveals the deleterious impact of such traumatic events as exposure to community violence (Finkelhor et al., 2009; Hawke et al., 2009), physical assault and sexual assault (Dixon et al., 2005; Ruchkin et al., 1998; 2002; Wood et al., 2002a), witnessing of abuse or domestic violence (Graham-Bermann et al., 2012; Moretti et al., 2006), and unexpected or untimely loss (Zinzow et al., 2009). Having such violent experiences is significantly related to adolescents' future perpetration of crime and deviant behaviors.

Exposure to victimization, especially of a violent or sexual nature, often creates disordered environments and places enormous strain and burden on adolescents' health and

behavior. Theories to understand and explain the role of such unstable environments and relationships are rather limited. To begin, the notion of strain evolves from particular cultural and social structure conditions espoused within social strain theories. Durkheim initially introduced the concept of anomie that was most developed in the book, *Suicide*, published in 1897. Anomie refers to a condition occurring when the society undergoes a rapid change, and it causes the breakdown of social norms. According to Durkheim, a lack of adequate regulation is the origin of a variety of social problems, including crime. In other words, an inadequate regulation at the societal level produces structural-level strain and an inability to meet needs creates individual-level strain.

Durkheim's influence has been extremely broad in criminology and sociology. Later scholars have adopted the concept of anomie that became the basis for strain theory. In 1938, Merton articulated that anomie/strain evolves from cultural and social structures that lead uneducated and poor individuals to commit crimes. Central to his theory, Merton assumed that uniform goals of economic success and middle-class status are established across all social classes in society. Strain comes from the lack of social means to achieve cultural goals like monetary success and middle-class status, leading the poor to commit crimes. The lower class is blocked from achieving monetary success or middle-class status. This is why they are vulnerable to strain and choose illegitimate means to achieve such goals.

Cohen (1955) disagreed with the assumptions in Merton's strain theory, pointing out that the strain theory is incapable of explaining purposeless crime. He introduced a new version

of strain theory, arguing that subcultures arise from class-based status frustrations. While Merton focuses on strain within the social structure, Cohen emphasized that strain results from the level of group interaction among individuals who are in different groups. Cohen argued that school-based achievement status that is embodied in the middle-class values as honesty, courtesy, and responsibility. Individuals who fail to achieve these middle-class values experience intense feelings of frustration or deprivation. By drawing on Merton's idea of strain, Cloward and Ohlin (1960) placed special emphasis on the intervening variables in their theory of differential opportunity systems. An insufficient number of suitable jobs is available for the number of qualified applicants. The gap between the opportunity available and social expectation is the primary source of strain that leads to delinquency.

However, these theories do not distinguish strained individuals from non-strained ones, failing to clarify the cause of crime among delinquent youths. That is to say, researchers are not able to explain why strained juveniles engage in crime and delinquent activities, whereas juveniles without strain do not. In macro-level analyses, researchers considered the social structure and the group of individuals who are under the same or similar social conditions. For example, they assumed that the poor or low-class people are more likely to commit crimes because of their limited or low probability of economic success. On top of that, researchers considered only the economic success as primary goals of committing crimes. They are many inexplicable crimes that are not associated with money.

In 1992, Agnew introduced General Strain Theory (GST) and points out that delinquent behaviors stem from the negative relationship with other people. Since its appearance, a substantial body of empirical tests has been conducted. Most of these studies reveal evidence that supports the statements underlying the theory: that exposure to strain increases the likelihood of engaging in deviant behavior (Agnew, 1985; Agnew & White, 1992, Aseltine Jr. et al., 2000; Cheung & Cheung, 2010; Mazerolle & Piquero, 1997; 1998; Mazerolle et al., 2000; 2003; Morash & Moon, 2007) and that negative emotions mediate the relationship between strains and deviant behavior (Bao et al., 2004; Brezina, 1996; Broidy, 2001; Jang & Johnson, 2003; Moon & Morash, 2013). Also, a close affiliation with delinquent peers increases adolescents' involvement in delinquent activities (Agnew & White, 1992; Bao et al., 2004; Baron, 2004; Mazerolle and Piquero, 1997; 1998; Mazerolle et al., 2000; 2003; Moon et al., 2009).

In the victimization literature, researchers have investigated why and how individuals become victims and what risk factors contribute to victimization experiences (Wolfgang, 1958). To understand the relationship between offenders and victims, Hindelang, Gottfredson, and Garafolo (1978) posit that lifestyle factors are significant. Along the same lines, routine activities theory explains that both mundane activity (e.g., regular work schedule) and risky behaviors (e.g., engaging in criminal behavior) can increase individuals' risk of being victimized (Cohen & Felson, 1979). What later researchers found is that offenders and victims share all or nearly all social and personal characteristics (Gottfredson & Hirschi, 1990).

More recently, researchers have studied risks and consequences of criminal victimization. Apparently, the literature is replete with information suggesting that experiencing or witnessing violence during childhood contributes to not only a variety of mental problems, but also to the likelihood of future perpetration of violent behaviors. First of all, it is well-established that exposure to violence is a significant risk factor for psychological problems, PTSD in particular (Ariga et al., 2008; Becker & Kerig, 2011; Dixon et al., 2005; Ford et al., 2008; Gorman-Smith & Tolan, 1998; Gorman-Smith et al. 2004; Haller & Chassin, 2014; Rosenberg et al., 2014; Richards et al., 2004; Shen, 2009). Results suggest that sexual assault, physical assault and witnessing violence increase PTSD symptoms, such as re-experiencing, numbing and hyperarousal.

It is also well-established that the risks of victimization change victims' behaviors that lead to engaging in crime and delinquency in the future. To put it simply, studies have documented that adolescents who have been exposed to violence are at disproportionate risk of responding to such victimization with crime and substance use (Burgess et al., 1988; Duncan et al., 1996; Kilpatrick et al., 2000; Smith et al., 2006; Wood et al., 2002b).

Despite the well-documented link between exposure to violence and future perpetration of violent behaviors, little is known about the processes that mediate this association. Far fewer GST researchers have tested the association between exposure to violence and delinquent behaviors among youths (Baron, 2004; Lin et al., 2011; Manasse & Ganem, 2009; Moon & Morash, 2013; Sigfusdottir et al., 2012), and only a handful of these

studies have found the effect of witnessing violence on delinquency (Agnew & White, 1992; Mazerolle & Maahs, 2000). Researchers have widely tested the mediating role of anger and reveal at least moderate support for the theory (Aseltine Jr. et al., 2000; Bao et al., 2004; Brezina, 1996; Broidy, 2001; Jang & Johnson, 2003 Moon & Morash, 2013). None of these studies, however, has provided an examination of the mediating role of PTSD on the link between exposure to violence and deviant behavior. Using data from the National Survey of Adolescents, the current study examines the direct relationship between experiencing sexual and physical assault and witnessing violence and deviant behavior. Also, the mediating role of three PTSD clusters on the relationships between violence exposure and juvenile crime and substance use will be examined.

The following chapters examine the mediating role of PTSD in explaining the relationships between exposure to violent victimization and crime and substance use, grounded within Agnew's general strain theory. Chapter 2 discusses the background of general strain theory and outlines its framework. Also, the victimization literature and empirical findings are discussed. Then, the causal model and hypotheses of the current study are stated. Chapter 3 discusses the data and sample to be used, along with the measurement of variables, to test the hypotheses. The analytic plan will discuss the type of regression analysis used and how the direct, indirect and mediating relationships among variables will be estimated. In Chapter 4, the results of the analysis are discussed. Finally, Chapter 5 summarizes and discusses the major

findings of the study, as well as discusses the study's limitations and implications for future policy and research.

Chapter II

Literature Review

Strain theory has played a central role in the explanation of crime and delinquency. Robert Agnew (1985, 1992) introduced General Strain Theory (GST) that stemmed from Merton's Strain Theory. The earliest contributions to the notion of strain came from Merton (1938). He claimed that anomie/strain evolves from cultural and social structures that lead uneducated and poor individuals to commit crimes. Central to his theory, Merton argues that anomie is brought about as a result of the discrepancy between cultural goals and institutionalized means. When the poor and less educated often have limited access to institutionalized means (e.g., education and employment), they are blocked from achieving monetary success or middle-class status. As a consequence, lower class individuals turn to illegitimate means to obtain their goals (Merton, 1938; Cohen, 1955; Cloward & Ohlin, 1960).

Despite the well-established concept by Merton, researchers raise questions about its theoretical limitations. In a series of papers, Agnew (1983, 1985, and 1992) questions the assumption that the failure to achieve monetary success and/or middle-class status is the only significant reason for committing crimes. He wonders whether or not such economic goals are the ultimate goals of youth, especially lower-class youth. Agnew points out that the theoretical framework cannot explain crimes committed by individuals whose primary goals are not achieving monetary success and middle-class status. Because research has demonstrated that

both lower- and middle-/upper-class youths engage in juvenile crime, Merton's anomie is unable to explain middle- and upper-class juvenile crime.

Agnew (1984) also questions the assumption that Merton's theory values only long-term goals, since it cannot explain why individuals change their behaviors and criminal activities over time. Agnew believes that immediate goals may be more important to explain juvenile delinquency across all socioeconomic backgrounds. Regardless of their socioeconomic status, Agnew believes that school-aged adolescents place greater value on current situations within immediate environments like home and school. In other words, since adolescents are closely attached to these environments, they place greater emphasis on goals related to school and home. Getting a good grade is important for adolescents, and they compete with others for achieving success at school. Examples of immediate school-related goals are academic, intellectual, student activities, athletics, affiliation, independence, and success (Agnew, 1984). They are also concerned with their relationship to parents at home. In this sense, Agnew believes that focusing on immediate goals will be useful to explain delinquency among middle- and upper-class youths.

Classic strain theory fails to explain the relationship between strains and delinquency: only strained individuals engage in delinquent activities, while individuals without strains do not. In response, Agnew (1983) considers a new direction for strain theory, posing that negative experiences or relationships with other people lead to stress. In micro-level analyses, Agnew articulates how exposures to diverse types of strain lead to antisocial responses. In his

revised strain explanation, Agnew (1992) refers to strain as negative or adverse relations with others, which are generated when individuals are not treated as they are expected to be treated. He defines three types of strain that focus on adolescents and their social environments: strain as the failure to achieve positively valued goals, strain as the removal of positively valued stimuli, and strain as the presentation of negative stimuli. Exposure to such strains leads people to be more favorable to delinquent acts. Agnew (1992) further articulates the role of negative emotions (anger, frustration, depression and anxiety): strain from negative relationships with other people increases negative emotions, which, in turn, increase the likelihood of engaging in delinquency and crime.

General Strain Theory

Agnew states that social strains can fall within one of three broad categories.

Strain as the failure to achieve positively valued goals. First, strain as the disjunction between aspirations and expectation/actual achievement is mentioned. Classical strain researchers contend that the lack of monetary success and/or middle-class status is a significant reason why people commit crimes. Also, the paucity of legal means and resources lead lower-class individuals to achieve their goals through illegitimate means. Instead of focusing on the monetary success and/or middle-class status, Agnew suggests a broader concept of strain that individuals from all classes may have been exposed. Regardless of their socioeconomic class, most individuals seek a variety of immediate goals. Not only lower-class people, but also individuals within middle- and upper-classes experience a gap between their expectations and

actual achievements, because the accomplishments may be influenced by such factors as personality, athletic ability and the like. Second, strain as the disjunction between expectations and actual achievements is explained. Individuals set their expectations based on their past experience and/or generalized people who are in similar conditions as themselves. When individuals see the gap between what they actually accomplished and what they expected, they are more likely to experience strain. The strain from their failure of achieving expected goals will lead individuals to feel particular negative emotions (e.g., anger, resentment, rage, dissatisfaction, disappointment and unhappiness) more frequently and these negative emotions will, in turn, lead to delinquent behaviors. Third, the last type of strain is the disjunction between just/fair outcomes and actual outcomes. Unlike the two forms of strains described above, this one does not require individuals to keep specific outcomes, but instead they expect certain justifiable outcomes. Individuals expect an equitable relationship to occur, meaning that they will get certain outcomes from certain inputs. However, an unequal ratio between inputs and outcomes brings about distress that in turn, leads to deviant behaviors. There are variations in the level of distress among people: some people may actively react to distress by engaging in deviance.

Strain as the removal of positively valued stimuli. This type of strain occurs when individuals lose or are deprived of the positively valued stimuli. Although the aggression literature has overlooked this type of strain, most stress studies consider strain as the removal of positively valued stimuli to be one of important stressful life events. Examples of this strain

are the loss of a boyfriend/girlfriend, the death of serious illness of a friend, moving to a new school district, the divorce or separation of one's parents, suspension from school, and the presence of a variety of adverse conditions at work.

Strain as the presentation of negative or noxious stimuli. This strain results from individuals' exposure to the negative or noxious stimuli under certain conditions. The presentation of noxious stimuli may lead to aggression and other negative outcomes, such as delinquency. Examples of this source of strain are child abuse and neglect, criminal victimization, physical punishment, negative relationships with parents and peers, adverse or negative school experiences, a wide range of stressful life events, and verbal threats and insults. When adolescents face such strains, they may try to escape from the stimuli, or try to alleviate the strain. In some cases, adolescents try to find revenge against the cause of strain, and/or they may resort to illicit drugs in order to manage their negative emotions.

Negative emotion. Another significant difference from classic strain theory is the mediating role of negative affective states. Even though strain is directly linked to juvenile delinquency, the relationship between strains and delinquency may be mediated by negative emotions, such as anger, frustration, depression and anxiety (Agnew, 1992). When adolescents experience stressful life events, they have higher levels of negative affect that lead to their engaging in a variety of criminal and deviant responses (e.g., engaging in violent and property crime, and using illicit drugs). Among the four negative emotions, Agnew states that anger is the most critical emotion for the purpose of general strain theory, because of its main

contribution to delinquency. Individuals become angry when they experience strain and this, in turn, leads to crime and deviance.

Coping strategies. Some individuals who experience or are exposed to strain do not engage in delinquent behaviors. Agnew (1992) contends that anger and delinquent responses do not necessarily follow strain. Some adolescents are able to adapt and cope effectively with anger and strain in several ways. First, individuals cognitively minimize their subjective adversity. When people are aware of what their problems entail, they try to manage the strain by reducing the absolute and/or relative importance assigned to goals/values/identities, by maximizing positive outcome and minimizing the negative outcomes, or by accepting responsibility for adversity. Second, individuals adapt behavioral coping strategies. They seek to achieve positively valued goals, protect or retrieve positively valued stimuli or minimize or eliminate the source of strain. On the other hand, some people seek solutions through revenge. Third, there are some individuals who handle their strains by alleviating the negative emotions rather than cognitively or behaviorally reacting to strains. For example, some people may use drugs, meditation, physical exercise and the behavioral manipulation of expressive gestures.

Nevertheless, there are individuals who respond to strain with anger and subsequent deviant behaviors. No matter which coping strategy they use, individuals are influenced by several individual (internal) and social (external) factors in choosing adaptations. For internal factors, people who have better skills can successfully alleviate the strain and negative affect. Examples of the personal skills are temperament, intelligence, creativity, problem-solving skills,

interpersonal skills, self-esteem, and self-efficacy. In terms of external factors, conventional social support and social bonding matter in responding to strains. Adolescents with high social support and social control tend to cope more effectively with emotional issues (House, 1981; Thoits, 1984).

Prior GST Research on Violent Victimization and Delinquency

Numerous studies have focused on strain as the presentation of negative or noxious stimuli. This category of strain has been measured as neighborhood or community problems, individual victimization, and negative relationships with family members, adults, and friends, (Agnew & White, 1992; Agnew et al., 2002; Bao et al., 2004; Baron, 2004; Lin et al., 2011; Manasse & Ganem, 2009; Mazerolle & Maahs, 2000; Moon & Morash, 2004; 2013; Sigfusdottir et al., 2012).

According to GST, Agnew indicates that victimization is a type of strain that may lead victimized adolescents to participate in delinquency and crime (Agnew, 2001). Victimization experiences can be measured in two ways - direct (interpersonal) and indirect (non-interpersonal) victimization. Both forms contribute to increasing criminal behaviors, including violent and property crime and drug use (Baron, 2004; Lin et al., 2011; Manasse & Ganem, 2009; Moon & Morash, 2013; Sigfusdottir et al., 2012). Using a sample of homeless street youth, Baron (2004) examines how three types of abuse (emotional, sexual, and physical abuse) and three types of victimization (property, violent, and robbery victimization) influence crime and drug use. The street adolescents experienced anger that is associated with emotional abuse

and violent victimization. Then, strained street adolescents with a high level of anger were found to engage frequently in property and violent crime, and drug use. Lin et al, (2011), in a study of the relationship between violent victimization and juvenile delinquency (Lin et al., 2011), demonstrated that direct violent victimization, vicarious victimization and dual victimization significantly increase violent and property crime and illicit drug use. A more recent study by Moon and Morash (2013) found that youths who experience emotional punishment from teachers participate in violent, property and illicit drug use, indicating victimization as a key predictor of delinquency. Unlike the three studies above, Sigfusdottir and colleagues (2012) do not examine drug use, but only violent and property crime. Results show that direct physical assault and witnessing parental conflicts increase the probability of youths' engagement in violent and property crime.

Limited research has examined neighborhood-related strains and criminal victimization. Nevertheless, these studies provide evidence in support of GST. In a now classic and still widely cited study, Agnew and White (1992) measure diverse strains, including neighborhood problems. Along with other negative life events, neighborhood problems positively affect youths' delinquency and drug use, while the attachments with family and peer groups reduce the delinquent behavior. A study by Mazerolle and Maahs (2000) used detailed scales to measure neighborhood –related strains. The scale consists of the witnessing of vandalism, winos/junkies, traffic problems, abandoned houses, burglaries/thefts, run-down/poorly kept buildings, and assault/muggings. Although they conclude that this strain is significant as it

increases adolescents' misbehaviors, a cumulative effect of the strains makes it hard to examine the independent effect of neighborhood-related strains on deviant activities. Also, contrary to the previous research, Barr and his colleagues (2012) found that adolescents' delinquency is not strongly affected by their experience of witnessing community violence.

Many researchers concur that the presentation of negative interpersonal relationships with family members and friends lead to delinquent activities. When adolescents conflict with parents or watch parents losing control of feelings or fight, they are more likely to engage in at least one of the delinquent behaviors. The delinquent behaviors examined are skipping school, hurting people, burglary, breaking others' property, and drinking (Agnew & White, 1992; Agnew et al., 2002). Likewise, Bao and colleagues (2004) show that negative relationships with parents, teachers and peers are significantly and positively related to delinquency. Peer rejection also accounts for an increase of juvenile crimes (Higgins et al., 2011). In studies of middle school students in South Korea, Moon and Morash (2004; 2013) reveal that emotional and physical punishment led students to more involvements in delinquent behaviors. In contrast, maintaining a good interpersonal relationship with teachers is crucial to controlling students' delinquency in such a setting. However, all of these studies measure the cumulative effect of strains. Also, the respondents in each study were asked their involvements in several types of delinquent activities: property crime, violent crime and alcohol use. Yet, because the cumulative effect of strains was measured, it is difficult to figure out which strain leads to which particular type of delinquency.

The Role of Negative Emotion in Strain-Delinquency Link

Agnew (1992) clarifies the GST's central proposition that negative emotions are positively associated with crime and drug use. The four kinds of negative affect identified are anger, frustration, depression and anxiety. In empirical studies, researchers have distinguished anger from other negative emotional states: anger and non-anger (Bao et al., 2004; Broidy, 2001), outer- and inner-directed emotions (Moon & Morash, 2013), and anger-in and anger-out emotion (Broidy, 2001; Jang & Johnson, 2003). More importantly, outer-directed emotion (anger) is associated with the outer-directed behavior (violent/property crime), whereas the inner-directed emotion (depression/anxiety) is related to the inner-directed behavior (substance use). Despite the similar classification of negative emotions, researchers found that negative emotions only partially mediate the effect of strain on delinquency, at best. Even worse, anger has been overlooked in the association between violent victimization and delinquency.

As Agnew points out the importance of anger, many researchers found a consistent finding that the mediating role of anger on the strain-delinquency relationship across different types of delinquency. For example, anger mediates between strains (unfairness) and delinquency (Agnew, 1985; Aseltine et al., 2000; Broidy, 2001; Mazerolle & Piquero, 1997; Rebellon et al., 2012). Individuals, who have a high level of anger and/or experience low constraint, are more likely to participate in misbehaviors than those who are not in such conditions (Agnew et al., 2002; Jang & Johnson, 2003). With regard to several forms of

negative emotion, Bao et al.'s (2004) findings reveal that four negative emotions result in diverse types of delinquent behaviors. Specifically, anger mediates the relationship of strain on outer-directed offending (e.g., engaging in violent crime), and resentment, anxiety and depression mediate the relationship of strain on inner-directed delinquency (e.g., skipping school). In a study of traditional and cyber bullying, Patchin and Hinduja (2011) conclude that the higher levels of anger and frustration play equal, but crucial roles on the link between strain and bullying. Interestingly, the interaction of strain and delinquency reduces four emotions (anger, resentment, anxiety and depression), concluding that delinquent behaviors reduce the effect of strain on negative affect (Brezina, 1996).

Nevertheless, researchers reveal inconsistent results. While individuals respond to unfairness and stressful events through increased levels of anger, they do not respond to the failure of achieving their goals either through anger or other negative emotions (Broidy, 2001). Similarly, researchers found that anger mediated the effect of strains on violent crimes, but failed to find the mediating role of depression on the relationship between strain and non-violent deviant behaviors (Aseltine et al., 2000; Piquero & Sealock, 2000; Jang & Johnson, 2003; Moon & Morash; 2013; Sigfusdottir et al., 2004). For example, Aseltine Jr. and colleagues (2000) found that negative emotions have a negligible mediating effect on the strain-delinquency link. They studied the mediating effects of both anger and anxiety on the relationships between strains (family conflict, peer conflict, and negative life events) and deviant behaviors (aggression, delinquency, and marijuana use). Consistent with GST, strains are strongly and

positively linked to negative emotion, and anger mediates the relationship between family conflict and aggression. However, anxiety neither directly affects delinquent behaviors nor mediates the effects of strains on delinquent behaviors.

Likewise, anxiety and depression do not predict either violent or nonviolent (Piquero & Sealock, 2000). Jang and Rhodes (2012) reached a slightly different result: anger significantly mediates the effect of strain on violent crime while depression and anxiety have a significant effect on property crime and marijuana use. Using data from 340 Russia adults, Botchkovar and Broidy (2013) also fail to find a mediating effect of negative emotions, but they found a moderating role on the strain-crime link.

For further clarification, Agnew (2006) differentiated “situational-based negative emotions” from “trait-based negative emotions.” The former refers to the negative emotions in response to strains, and the latter refers to the general tendency to experience certain emotions. Mazerolle and Piquero (1997) employed an innovative approach to measure the differences between trait-based and situational-based negative emotions. Using a scenario of fighting for a survey with a random sample of 338 university students, they revealed that strain was positively related to anger that increased the probability of intentions to engage in assault. Mazerolle and Piquero (1998) added two additional scenarios that illustrated shoplifting and drinking and driving. Results showed that strains are significant predictors of anger, but anger is only related to violent behaviors. Using the same scenarios, Capowich and colleagues (2001) found that that trait-based anger leads to shoplifting and situational-based anger is positively

related to assault. For furthering understanding of trait- and situational anger, Mazerolle et al. (2003) created a model to estimate the impact of trait-based anger on situational-based anger. They found that that trait anger increased strain and situational anger. Assault is directly affected by trait-based anger, and its link to strain is mediated by situational-based anger. It has a stronger direct effect than the mediating effect in the study. In addition, situational-based anger plays an important mediating role in the strain-shoplift link.

A recent study that utilizes the same scenarios by Ganem (2011) examines fear, as well as anger and frustration. As expected, anger leads to interpersonal violence crime and fear is associated with escapist behaviors and interpersonal violent crimes. However, it is hard to clarify the effect of negative emotions since three types of negative emotions are found in all scenarios. Thus, Ganem (2011) concludes that frustration is the significant emotion, due to the largest effect size. Another attempt to test the differences between two types of strains was made by Moon and his colleagues (2009), indicating the significance of situational-based anger. They measure uncontrollable outbursts of temper, urge to beat and harm someone, and urge to break things. Situational-based anger mediates the relationship between strains (parental punishment, teachers' punishment, and examination-related strain) and delinquency, whereas trait-based anger did not mediate the relationship.

Although anger, an essential component of the GST, is logically connected to violent responses, it is rather ironic that most of the victimization studies fail to examine anger and instead focus on the role of depression (Manasse & Ganem, 2009; Lin et al., 2011). For example,

Manasse and Ganem (2009) use a sample from the fifth and sixth waves of the National Youth Survey (NYS) to determine how depression mediates the strain-delinquency relationship.

Victimization is measured as sexual attacks, property crimes, and attacks with weapons. As expected, victimized adolescents are more likely to engage in serious forms of offending (rape, robbery, and assault) and minor offenses (disorderly conduct, panhandling, and obscene phone calls). Results suggest that male adolescents who experienced depressive symptoms in the past year show higher rates of committing those crimes than those who did not. In the same way, depression mediates the effects of direct violent victimization, witnessing of violence and dual violence on drug use (Lin et al., 2011).

Victimization

During the past five decades, researchers have investigated why and how individuals become victims and how victimization risk is linked to offending behavior (Wolfgang, 1958). Research has investigated the role of risk factors in predicting and explaining victimization experiences. For example, Hindelang, Gottfredson, and Garafolo (1978) posited that lifestyle factors are significant in understanding and explaining criminal victimization. In the following year, Cohen and Felson (1979) introduced routine activity theory. They found that both mundane activity (e.g., regular work schedule) and risky behaviors (e.g., engaging in criminal behavior) could increase individuals' risk of being victimized. Gottfredson (1981) asserted that the close association between offending and victimization could be explained, in part, by the similarities between offenders and victims. His assertion is supported by Gottfredson and

Hirschi's later argument (1990) that offenders and victims share all or nearly all social and personal characteristics. In doing so, Gottfredson and Hirschi (1990) introduced general theory of crime and posited that low self-control can enhance risk for victimization.

In addition to examining the shared features between offenders and victims, studying victims and the consequences of victimization are also important in understanding their future risk of committing crimes. In other words, individuals who are exposed to traumatic events during childhood often become victims of violence, and, at the same time, they have a high risk of engaging in violent crimes in the future (Wood et al., 2002b). Overall, the association between violent victimization and subsequent outcomes has been established: juveniles with a history of exposure to and/or witnessing violence have a greater likelihood of engaging in delinquent activities and substance abuse than those without such a history (Duncan et al., 1996; Kilpatrick et al., 2000).

Prior researchers have identified two kinds of violent victimization: interpersonal (direct) and non-interpersonal (indirect or witnessing) violent experience. Direct violence exposure consists of physical assault, sexual assault, child neglect, physical/emotional abuse, and being injured. The main reason for this distinction is that interpersonal violence exposure and non-interpersonal violence exposure are associated differently with subsequent externalizing and internalizing outcomes. Externalizing outcomes refer to outgoing antisocial behaviors (e.g., violent and property crime), while internalizing outcomes are related to high negative emotional states (Ford, 2002).

Violent victimization and internalizing responses. Experiencing or witnessing violence contributes to internalizing symptoms, such as anger, anxiety, depression and PTSD. Most psychologists who have examined the relationship between violent exposure and mental health have paid more attention to post-traumatic stress disorder (PTSD) than any other types of internalizing symptoms. It is because PTSD has been established as a common mental health problem among highly traumatized populations that result from exposure to violence (Boney-McCoy & Finkelhor, 1996; Kilpatrick et al., 2000; 2003).

When considering various forms of direct exposure to violence, children reveal a higher level of mental stress when they are neglected at home (Chen et al., 2011), and when they are physically or verbally abused in the home (Allwood et al., 2011). Hoyt et al. (2012), in a study of intimate partner violence (IPV) among a sample of adult females, analyzed three groups, including a PTSD group, a non-PTSD group, and a non-trauma group. As expected, individuals in the PTSD group had a higher level of anxiety and depression than those in the other two groups. Similarly, Reingle-Gonzalez and colleagues (2014) found that the female respondents experienced an increase in PTSD when they suffered from IPV. They also discovered that the females who suffered from IPV used alcohol and marijuana heavily.

Non-interpersonal (or indirect) violence also increases PTSD symptoms. For example, youths who live in dangerous neighborhoods and are exposed to violence at home and/or in the community are at increased risk of exhibiting PTSD symptoms (Allwood et al., 2011). Consistent with studies of adults, IPV and other conflicts between parents increase mental

problems among children (Graham-Bermann et al., 2012; Moretti et al., 2006). For instance, Graham-Bermann and colleagues (2012) found that 38 percent of the 120 children, aged 4 to 6 years old, experienced IPV in the past 2 years. From these studies, IPV negatively affects both adults and children. Martin et al. (2013) also found that high levels of exposure to community and family violence are significantly and positively associated with adolescents' unhealthy mental condition, especially PTSD. Of the 231 school-going children and adolescents, 49.8% met criteria for a formal diagnosis of PTSD. The Child Exposure to Community Violence Checklist (CECV) was utilized to estimate their exposure to community violence, and 29 out of 39 items measuring vulnerability to community violence were related to.

It is still unclear how the types of violent victimization differentially influence PTSD symptoms. Far fewer studies measured the independent effects of violent victimization on PTSD symptoms. Kerig and colleagues (2012) found that interpersonal trauma is related to re-experiencing, avoidance/numbing, and hyperarousal symptoms for delinquent girls in a juvenile detention center, whereas both interpersonal and non-interpersonal trauma are related to PTSD clusters for delinquent boys. Also, Allwood and Bell (2008) found that witnessing violence in the community is related to re-experiencing symptoms among girls, but it is related to hyperarousal symptoms among boys. Finally, Sullivan and colleagues (2006) demonstrated that sexual abuse increases re-experiencing symptoms, while emotional abuse increases avoidance/numbing and hyperarousal symptoms.

Violent victimization and externalizing responses. Exposure to violence in adolescents has been shown to increase subsequent externalizing symptoms. To examine how exposure to violence results in delinquency, numerous studies have focused on juvenile offenders who have been detained within the juvenile justice system. Their research suggests that many of the youth offenders have experienced at least one type of violence exposure during their childhood (Ariga et al., 2008; Cisler et al., 2012; Haller & Chassin, 2014; Hawke et al., 2009; Rosenberg et al., 2014; Shen, 2009). For example, Hawke and colleagues (2009) examine 106 youths, aged 13 to 18, in outpatient treatment for alcohol use disorders (AUD) and their past traumatic experiences. Not surprisingly, almost 90 percent of the sample had experienced a traumatic experience in their life. Specifically, 49 percent of the sample reveals that their exposure to interpersonal violence included physical assault, threatening with a weapon, mugged/kidnapped, and/or witnessing violence at home or in the community. In addition, approximately 19 percent of the youths had been previously sexually assaulted. Finkelhor et al. (2009) found a similar result. Among the 4,500 respondents in the study, more than 2,700 of the youths (60%) had experienced or witnessed violence in the past year. Along the same lines, Becker and Kerig (2011) found that 95 percent of detained boys for their involvement in violent crimes had experienced one of the violent crimes.

Studies that focused on interpersonal victimization or direct exposure to violence conclude that individuals who had been victimized by other people are more likely to commit violent crimes and delinquency (Maschi & Bradley, 2008; McCarty et al., 2007; Wood et al.,

2002b). Furthermore, studies have found associations between child neglect and drug/alcohol use (Chen et al., 2011), child sexual assault and substance use (Ullman et al., 2013), and violent victimization and violent crime and delinquency (Brunelle et al., 2014; Cohen et al., 2006; Farrell & Sullivan, 2004; Gorman-Smith et al., 2004; Kilpatrick et al., 2000).

In terms of sexual assault, significant percentage of female offenders have experienced and reported their past sexual victimization. In a comparison between incarcerated and high school students, 29 percent of the incarcerated adolescents reported having been sexually assaulted or molested, while 11 percent of the high school students did (Wood et al., 2002a). Dixon and colleagues' finding (2005) shows that 37 percent of the sample reported sexual abuse during childhood. However, Ruchkin and his colleagues (2002) found that only 8 percent of the 351 youths reported sexual abuse. However, this low prevalence rate is likely due to the respondents' reluctance to report such events (Ruchkin et al., 1998).

Witnessing violence is also a critical factor in predicting delinquent behaviors (Wood et al., 2002a). This type of violent exposure consists of witnessing robbery, burglary, physical assault, sexual assault, and homicide at home and in the community. Regarding community violence, Finkelhor and colleagues (2009) report that about 42 percent of the sample had witnessed violence in their community. Similarly, Wood and colleagues (2002a) interviewed incarcerated adolescents and high school students in order to examine the impacts of witnessing violence in their community on PTSD and misbehaviors. Adolescents who are in the juvenile justice system report significantly higher exposure to community and family traumatic

experiences than high school students. Specifically, 92 percent of incarcerated adolescents are aware of a homicide incident in the community, but 57.5 percent of high school students know such incidents in their community. More than 55 percent of incarcerated adolescents witnessed a dead body, someone with gun, someone physically assaulted, and someone sexually assaulted, whereas less than 15 percent of high-school students witnessed these experiences.

In the studies involving youth detained for misdemeanors, detained youths have a high level of PTSD, suggesting that PTSD is closely related to delinquent behaviors (Ariga et al., 2008; Dixon et al., 2005; Ford et al., 2008; Haller & Chassin, 2014; Hawke et al., 2009; Rosenberg et al., 2014; Shen, 2009). Furthermore, PTSD symptoms may arise with other forms of negative affect. For instance, Ariga and colleagues (2008) reveal significantly high psychiatric comorbidity between PTSD and other negative affect: the female juvenile offenders with PTSD also had a high level of depression and abnormal eating patterns. Similarly, 61 percent of the 264 detained juveniles at the State of Connecticut pretrial juvenile detention centers met the criteria of PTSD and suicide ideation tested by Traumatic Experiences Screening Instrument (TESI), UCLA PTSD Reaction Index (PTSD-RI), and Suicide Ideation Questionnaire (SIQ).

Limitations of Prior Research

It appears that GST is best suited to explain how victimization triggers negative affective states and subsequent deviant behaviors. Developmental psychology studies contribute to the theory with evidence showing that exposure to violence can lead to severe mental problems like PTSD. GST has the potential to explain such a link. Yet, the role of PTSD in the association

between exposure to violence and deviant behaviors remains to be determined. As discussed above, studies that focus on violence exposure indicate that PTSD is one of the most common indicators of mental health among traumatized populations. . However, since Agnew did not bring PTSD into the discussion of his theory and even in his revised version of the theory, PTSD is not considered among the four types of negative affect (anger, anxiety, depression and frustration).

Several limitations of previous studies have been identified. First, there is little known about how a particular type of victimization leads to different types of delinquent activities. The primary reason for the inconsistent results is that most studies measure the cumulative effect rather than an independent effect of each type of victimization on delinquent behaviors. Some studies combine all like items or measures into a single summated victimization scale. Studying cumulative effect of violence exposure is important; yet, this approach hampers researchers' ability to examine the independent effects of particular types of violence exposure.

Second, GST studies have not considered psychological states beyond those negative affect states identified in the theory. The broader victimization literature has identified PTSD as playing an important role in the victimization-crime link; yet, most studies fail to consider the mediating role of PTSD. Many studies provide evidence consistent with the notion that exposures to violence generate an increase in PTSD and engaging in delinquent activities. Yet, in their analyses, PTSD and deviant behaviors are considered only as dependent variables. Clearly, the relationship between PTSD and deviant behaviors has been overlooked. Few studies

directly examine the mediating role of PTSD. Using data from the National Women's Study (NWS), researchers point out that PTSD mediates the relationship between childhood rape and adult alcohol abuse (Epstein et al., 1998). Two other studies also suggest that the link between violence and perpetration is mediated by PTSD (Allwood & Bell 2008; Ruchkin et al., 2002). While GST studies have examined the mediating role of anger, they have not considered PTSD. Research is needed to examine more fully the mediating role of PTSD within the GST framework.

Finally, the effect of each PTSD cluster has not been considered in most of the psychology studies. In previous studies, researchers measured PTSD symptoms as a single summary measure in their model. However, specific PTSD symptom clusters may be differentially related to particular types of violence exposure. Sullivan et al. (2006) found that sexual abuse increases re-experiencing symptoms, while emotional abuse increases avoidance/numbing and hyperarousal symptoms. Gender may matter in the association between violence experience and PTSD symptoms. For example, Kerig and colleagues (2012) and Allwood and Bell (2008) found that interpersonal and non-interpersonal violence victimization are differentially related to PTSD symptoms for boys and girls. Based upon the findings from these empirical studies, it is not difficult to imagine that each PTSD cluster may have different mediating effects on the relationship between victimization and violent crime. Exposed to the same strains, adolescents with hyperarousal symptoms may resort to externalizing responses while avoidance and numbing symptoms may likely lead to internalizing

responses. In addition, a particular type of violence exposure may be significantly related to a particular cluster of PTSD symptoms that, in turn, leads to particular behavioral responses. From this, further consideration is required to examine if a specific PTSD cluster plays an important role in the relationship between violent victimization and delinquent behaviors.

Current Study

Increasing attention has been paid to the issue of victimization and mental health - PTSD in particular - among juveniles with a history of exposure to violence. Nonetheless, limited research is available that examines the complex relationships between violent victimization, PTSD symptoms and juvenile delinquency. It is unclear whether juveniles respond to both direct and indirect violence exposures, whether certain PTSD symptoms play a greater mediating role than others, or whether a particular type of violence experience is linked to a certain type of delinquent activity.

To address these limitations, the current study will use data from the National Survey of Adolescents of the United States (1995). This study investigates the extent of direct exposure to violence, such as physical assault and sexual assault, and witnessing violence at home and in the community. This study assesses the prevalence of three categories of PTSD: re-experiencing, avoidance/numbing, and hyperarousal. It also measures juveniles' engagement in violent and property crime and substance use (alcohol and illicit drug). Using this data, the current study will build upon prior research on general strain theory and juvenile delinquency in several important ways. First, it expands on the victimization-mental health link, grounding the

association within the general strain theory framework. As the most significant mental problem, the study will examine the relationship between PTSD and experiencing physical and sexual assault and witnessing violence at home and in the community. Further, the mediating role of PTSD clusters between exposure to violence and outer-directed responses (property and violent crime) and inner-directed responses (alcohol and illicit drug use) will be tested. Second, this study examines the independent effects – direct and indirect - of experiencing or witnessing violence on delinquent activities. Third, it systematically examines the relative contribution of each PTSD cluster within the full model. Taken together, this research will examine the impact of specific victimization exposures on PTSD and crime and substance use and the mediating role of PTSD on the victimization-crime and substance use link.

Causal model and hypotheses. The current study will test several key hypotheses of Agnew's general strain theory. Although Agnew mentioned three types of strains, this study focuses on the victimization experience that belongs to the third type of strain: the presentation of negative or noxious stimuli. In terms of victimization experience, sexual assault and physical assault are considered as direct forms of exposure to violence and witnessing violence is examined as non-direct exposure to violence. Figure 1 depicts the causal model to be estimated. First, the model considers if these three victimization experiences directly increase the likelihood of outer-directed responses (property and violent crime), and inner-directed responses (alcohol and illicit drug use). Second, the model examines the mediating role of three PTSD clusters (re-experiencing, avoidance/numbing, and hyperarousal) on the

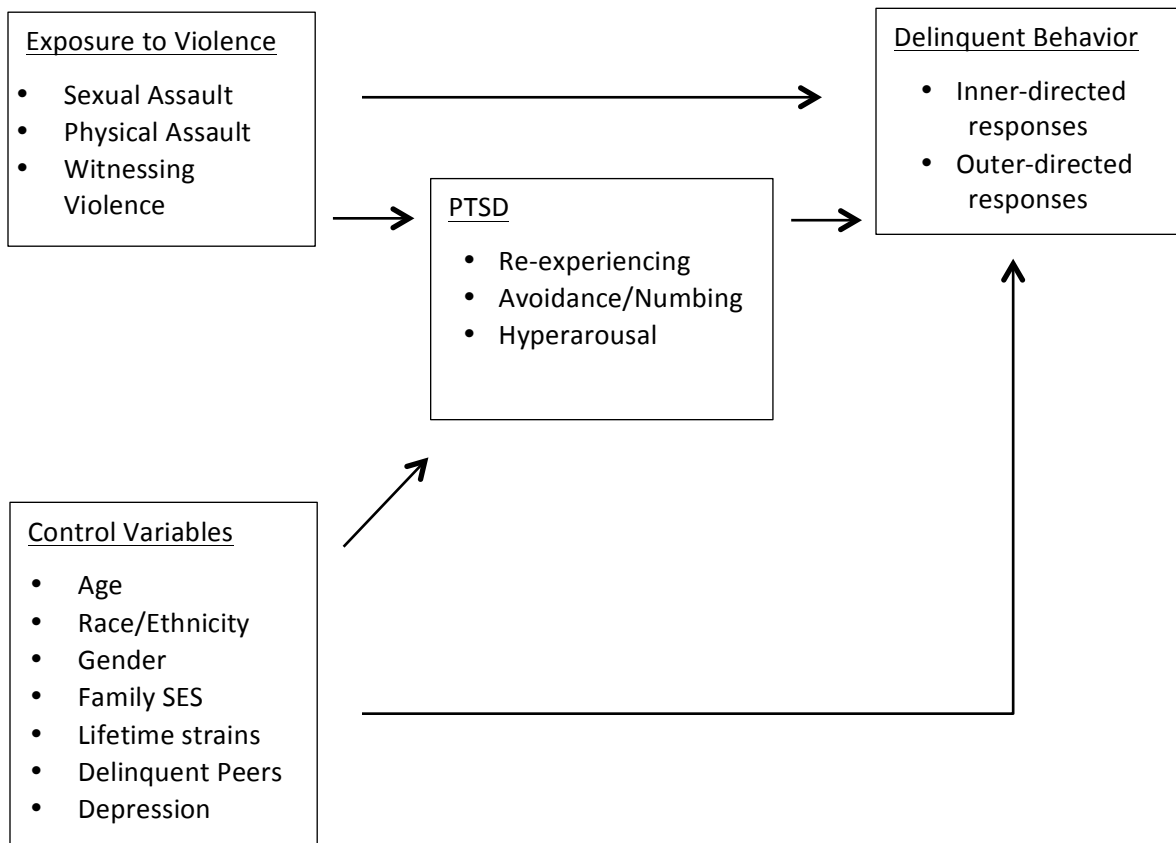
relationships between victimization exposure on property and outer-directed responses (property and violent crime), and inner-directed responses (alcohol and illicit drug use). If PTSD symptoms mediate the victimization exposure-crime link, then the size and significance of the victimization exposure effects on adolescent crime and substance use should be reduced substantially. Victimization exposure is expected to increase PTSD symptoms which, in turn, will increase the likelihood of adolescent crime and substance use. Sociodemographic variables are included in the model, controlling for their effects on PTSD and adolescent crime and substance use. The association with delinquent peers is also included to examine the conditioning effect. Strains as the failure to achieve of positively valued stimuli are tested, since they are regarded as stressful life events among youths. However, strains as the removal of positively valued stimuli are not tested in this study. Also, the current study does not test coping strategies and conditioning factors, such as self-esteem and self-control. Three measures of depressive symptoms are dichotomized and included as a control variable.

This study examines the following hypotheses.

1. Adolescents who witnessed or experienced physical assaults or experienced sexual assault have a higher probability of experiencing PTSD symptoms than those adolescents who do not experience such victimizations.
2. Adolescents who witnessed or experienced physical assaults or experienced sexual assaults have a higher probability of engaging in juvenile crime and substance use than those adolescents who do not experience such victimizations.

3. The relationship between experiencing/witnessing violence and juvenile crime and substance use will be mediated by PTSD symptoms.

Figure 1: The Causal Mode



Chapter III

Methods

This chapter provides a description of how the data and sample were collected in the National Survey of Adolescents. Then, the measurement of the variables used in the current study is discussed. Lastly, the analytic plan to test hypotheses is discussed.

Data and Sample

The current study utilizes data from the National Survey of Adolescents (NSA) in the United States available through the Interuniversity Consortium for Political and Social Science (ICPSR) (Kilpatrick & Saunders, 1995). The original purpose of Kilpatrick and Saunders' study was to examine the effect of nonfamilial violence or child victimization on youth-related mental health (e.g., Posttraumatic Stress Disorder) and behavior problems (e.g., substance use and abuse and delinquent behavior). The NSA data set includes information on childhood sexual and physical victimization. Importantly, detailed information about each incident was collected, including the frequency of incidents, offender information, locations, and aftermath of reports. Further, this data includes a great deal of information on alcohol and drug use and abuse, including the type of substance, frequency, amount, and withdrawal symptoms.

A multi-stage stratified random sampling design was utilized. Of the 5,367 eligible households, 90.1 percent of the parents completed brief interviews, and 78.9 percent of parents gave permission for their adolescents to be interviewed. With permission from a parent or guardian, 4,023 adolescents agreed to participate and completed interviews, with a

participation rate of 75 percent. As a nationally representative sample of adolescents, the 1995 sample consisted of male and female adolescents between the ages of 12 and 17. The sample excluded adolescents who were living in U.S. households without a telephone, who did not reside with a parent or guardian, or whose parents did not speak English or Spanish. Using Computer-Assisted Telephone Interviewing (CATI), the interviews were conducted between January and June 1995. Each respondent received \$5 and certificate for completing the survey.

All respondents were asked information regarding their victimization (e.g., history of sexual and physical assault) and stressful life events (e.g., family loss, parents' unemployment) from early childhood up to the time of the interview. The survey also included the adolescents' delinquent behaviors and numerous mental health indicators. Adolescents who were physically and/or sexually victimized were identified by a series of follow-up questions regarding the incidents.

Demographic information was collected from adolescents' parents or guardians. This included family income, marital status, employment status, and level of education. Table 1 summarizes the descriptive statistics for the sample. The sample has a mean age of 14.51 with a standard deviation of 1.64 and included approximately equal number of males and females. Approximately, 70 percent of the respondents identified themselves as Caucasian, about 15 percent identified themselves as African American, and about 10 percent identified themselves as Hispanic. A majority of participants (82.73%) came from a household in which total family income is above the poverty level. Approximately, 60 percent of the surveyed youths reported

experiencing depressive symptoms, and about 45 percent of the youths reported experiencing stressful life events. More than 70 percent of the respondents informed that they had delinquent peers.

Measurement of Variables

For the current study, the measures include juvenile crime and substance use, witnessing violence, physical and sexual victimization, stressful life events, negative emotional states, exposure to delinquent peers, and a host of sociodemographic characteristics. A description of each of the measures is provided below.

Dependent variables. Previous research on general strain theory has examined the effect of strains on property crime, violent crime, alcohol use, and illicit drug use. Some employ the dependent variables in separate measures, while others categorize deviant behaviors as violent crime (violent and property crime) and non-violent crime (alcohol and illicit drug); still others combine such deviant behaviors into a single scale (Agnew & White, 1992; Agnew et al., 2002; Bao et al., 2004; Baron, 2004; Lin et al., 2011; Manasse & Ganem, 2009; Mazerolle & Maahs, 2000; Moon & Morash, 2004; 2013; Sigfusdottir et al., 2012). The dependent variables in this study consist of inner-directed response (alcohol use and illicit drug use) and outer-directed response (violent and property crime).

Inner-directed response. The respondents were asked whether they had drunk beverages that contained alcohol during their life up to the point of the interview. The single-item question about their alcohol use asked: “Have you ever had a drink of beer, wine, liquor,

Table 1

Summary of Descriptive Statistics for Control Variables (N=4,023)

	<u>Variable</u>	<u>N</u>	<u>%</u>	<u>Mean</u>	<u>S.D.</u>
Age	12	576	14.34%	14.51	1.64
	13	685	17.05%		
	14	744	18.52%		
	15	733	18.25%		
	16	682	16.98%		
	17	597	14.86%		
Gender	Female (0)	2005	49.84%		
	Male (1)	2017	50.14%		
Race	Caucasian	2746	69.52%		
	African American	572	14.48%		
	Hispanic	390	9.87%		
	Native American	135	3.42%		
	Asian	67	1.70%		
	Other	40	1.01%		
Family SES	Below Poverty Level	651	17.27%		
	Above Poverty Level	3119	82.73%		
Stressful Life Events	Yes (1)	1800	44.91%		
	No (0)	2208	55.09%		
Delinquent Peers	Yes (1)	2539	72.21%	0.72	0.45
	No (0)	977	27.79%		
Depression	Yes (1)	2289	60.62%	0.61	0.49
	No (0)	1487	39.38%		

or any alcoholic beverage?" They answered "yes" or "no" to this question. The variable was coded as 0 for drinking no alcoholic beverage and 1 for drinking at least one alcoholic beverage

(.822)¹. Regarding illicit drug use, the respondents were asked a question about whether they have ever used illicit drugs during their life up to the point of the interview. They were asked: “Have you ever taken any of the following drugs?” including (1) marijuana, (2) cocaine or crack, (3) angel dust or PCP, (4) LSD or other hallucinogenic like peyote, psilocybin, or mushrooms, (5) heroin or methadone, (6) inhalants like glue, nitrous oxide, amyl nitrate, paint or gasoline. They answered the first illicit drug they used, followed by the second, the third and up to the sixth illicit drug used. Two approaches were utilized to recode this variable. First, the answer to the first mentioned illicit drug was recoded as a dichotomous variable measured as 0 for using no illicit drug and 1 for is using at least one illicit drug. Second, based on the answers for first through sixth mentioned drugs, dummy variables were created. Two approaches reached the same result of individuals who use specific type of illicit drug: 660 people used Marijuana, 43 people used Cocaine, 139 people used LSD, 127 people used Inhalants, 22 people used Angel Dust, and 10 people used Heroin. The measures were recoded as a dichotomous variable where 0 refers to not using any illicit drugs and 1 refers to using at least one illicit drug (.822). Then, the scores for alcohol and illicit drug use were summated. The measures were recoded as a dichotomous variable which refers to not drinking alcohol beverage or using and any illicit drugs and 1 refers to drinking at least one alcohol beverage or using at least one illicit drug. The factor loadings for these questions are good. However, the reliability coefficient is .507 that indicates relatively low reliability. This is expected when only a limited number of measures are used.

¹ The number indicates the factor loadings for each measure. Factor loadings represent how much a factor explains a variable in factor analysis.

Outer-directed response. The respondents were asked a series of six questions about whether they had been involved in any violent and property crimes during their life up to the point of the interview. The respondents provided information about the prevalence of several violent and property misdemeanors, including being involved in gang fights, attacking other people, and stealing money/motor vehicle. They were asked: “Have you ever been involved in gang fights?” (.637), “Have you ever used force or strong-arm methods to get money or things from people?” (.502), and “Have you ever attacked someone with the idea or seriously hurting or killing that person?” (.617), “Have you ever stolen or tried to steal something worth more than \$100?” (.745), “Have you ever stolen or tried to steal a motor vehicle such as a car or motorcycle?” (.622), and “Have you ever broken into or tried to break into a building or vehicle to steal something or just look around?” (.652). They answered “yes” or “no” to each question. The scores were initially summated as 0 to 6. Then, the measures were recoded as a dichotomous variable where 0 refers to engaging in no violent and property crime and 1 refers to committing at least one violent or property crime. The factor loadings for these questions are good, and the reliability coefficient is acceptable ($\alpha = .687$).

Post-traumatic stress disorder (PTSD). Agnew (1992) articulates that strains lead to negative emotions that mediate the relationship between strains and delinquency. GST includes anger, anxiety, depression and frustration, but most researchers have focused solely on anger. Anger is typically measured by asking respondents if they have easily lost their temper, got mad, felt annoyed, yelled at somebody, or threw things (Agnew & White, 1992; Agnew et al.,

2002; Bao et al., 2004; Derogatis, 1977; Mazerolle & Maahs, 2000; Moon & Morash, 2004; 2013). In terms of anxiety, prior studies have asked about feeling tense, nervous, fearful, or being panicked (Brezina, 1996; Piquero and Sealock, 2000). For depression, a number of questions were asked about sleeping problems, change in appetite, crying spells, low level of activity and suicide ideations (Brezina, 1996; Manasse & Ganem, 2009; Lin et al., 2011).

Mental health researchers have paid more attention to measuring PTSD than any other mental health indicator. Currently, *Diagnostic and Statistical Manual of Mental Disorders* is widely employed to diagnose mental health conditions, including post-traumatic stress disorder (*DSM-IV*; 4th ed. American Psychiatric Association, 1994). According to the *DSM-IV*, a potential traumatic stressor refers to direct personal “experiences or witnessing of events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others” and “the person’s response involved intense fear, helplessness, or horror.” The diagnostic model of post-traumatic stress disorder (PTSD) consists of three criteria: re-experiencing (Criterion B; e.g., recurrent and intrusive distressing recollections and/or dreams of the events, acting or feelings toward the events), avoidance and numbing (Criterion C; e.g., efforts to avoid certain feelings and places, inability and uninterested in things) and hyperarousal (Criterion D; sleeping problems, difficulty of concentrating, hypervigilance) (APA, 1994).

The NSA data set contains a series of questions that measure PTSD. However, some of the questions may also be considered as indicators of depression or anxiety, because the three

criteria of PTSD overlap with symptoms associated with depression and anxiety. For example, sleeping problems and low activity level may be considered as depression symptoms or avoidance and numbing. Likewise, symptoms of hyperarousal match with anxiety and depression indicators. Since the current study aims to test the effects of PTSD clusters, PTSD clusters are categorized by *DSM-IV*. Table 2 displays the three clusters of 22 selected questions.

The respondents were asked a series of ten questions about whether they had experienced PTSD symptoms during their life up to the point of the interview. The first cluster for re-experiencing symptoms (Criteria B) contains six measures. They were asked: “Have you ever been a period of two weeks or more during you kept having unpleasant memories, or seeing them in your mind?” (.735), “Have you ever been a period of two weeks or more during you had repeated bad dreams or nightmares?” (.569), “Have you ever been a period of two weeks or more during disturbing memories kept coming into your mind whether you wanted to think of them or not?” (.759), “Have you ever been a period of two weeks or more during you felt a lot worse when you were in a situation that reminded you of something that had happened in the past?” (.636), “Have you ever been a period of two weeks or more during you found yourself reacting physically to things that reminded you of something that had happened in the past?” (.529), and “Have you had a flashback that is, have you ever had an experience in which you imagined that something that happened in the past was happening all over again?” (.440). They answered “yes” or “no” to each question. The scores were initially summated as 0 to 6. Then, the measures were recoded as a dichotomous variable where 0 refers to

Table 2

Three PTSD Clusters (N=3,881, $\alpha = .877$)

Criterion B	Kept having unpleasant memories	0.735 ²
Re-experiencing ($\alpha = .660$)	Repeated bad dreams or nightmares	0.569
	Disturbing memories kept haunting you	0.759
	Situation that reminded you of past	0.636
	Reaction b/c reminded of past situation	0.529
	Ever had a flashback	0.440
	Criterion C	Felt like can't remember part of bad experience
Avoidance/numbing ($\alpha = .795$)	2 weeks of unenjoyment of most things	0.677
	Lost interest in activities	0.845
	Tried not to think about something	0.538
	Stopped caring about activities	0.828
	Wen out of way to avoid places	0.619
	Tried to avoid feeling about something	0.655
	Feel cut off from people	0.458
	Could not feel thing anymore	0.459
	Plans for future changes by past	0.555
	Criterion B	Had trouble concentrating
Hyperarousal ($\alpha = .674$)	Felt you had to be on guard much of time	0.585
	Difficulty falling asleep	0.645
	Unexpected noise startled you	0.574
	Found yourself suddenly feeling anxious	0.593
	Little things bother you a lot	0.660

² The number indicates the factor loadings for each measure in each criterion. Factor loadings represent how much a factor explains a variable in factor analysis.

experiencing no re-experiencing symptom and 1 refers to for experiencing at least one re-experiencing symptom. The factor loadings for these questions are mixed, although the reliability coefficient is acceptable ($\alpha = .660$).

The second cluster for avoidance/numbing symptoms (Criteria C) contains ten measures. They were asked: "Have you ever felt that there were parts of any such experience that you couldn't remember?" (.529), "Have you ever been a period of two weeks or more when you were uninterested in most things or unable to enjoy things you used to do nearly every day?" (.677), "Have you ever been a period of two weeks or more during you lost interest in activities which usually meant a lot to you?" (.845), "Have you ever been a period of two weeks or more during you deliberately tried very hard not to think about something that had happened to you?" (.538), "Have you ever been a period of two weeks or more during you stopped caring about activities in your life that used to be important to you?" (.828), "Have you ever been a period of two weeks or more during you went out of your way to avoid certain places or activities which might remind you of something that happened to you in the past?" (.619), "Have you ever been a period of two weeks or more during you deliberately tried to avoid having any feelings about something that happened to you in the past?" (.655), "Have you ever been a period of two weeks or more during you felt cut off from other people or found it difficult to feel close to other people?" (.458), "Have you ever been a period of two weeks or more during it seemed you could not feel things anymore or that you had much less emotion than you used to?" (.459), and "Have you ever been a period of two weeks or more

during the way you think about or plan for the future was changed by something that happened to you in the past?" (.555). They answered "yes" or "no" to each question. The scores were initially summated as 0 to 10. Then, the measures were recoded as a dichotomous variable where 0 refers to experiencing no avoidance/numbing symptom and 1 refers to for experiencing at least one avoidance and numbing symptom. The factor loadings for these questions are mixed; yet, the reliability coefficient is quite acceptable ($\alpha = .795$).

The third cluster for hyperarousal symptoms (Criteria D) contains six measures. They were asked: "Have you ever been a period of two weeks or more during you had trouble concentrating or keeping you mind on what you were doing, even when you tried to concentrate?" (.659), "Have you ever experienced a period of two weeks or more during you felt you had to stay on guard much of the time?" (.585), "Have you ever been a period of two weeks or more during you had difficulty falling asleep or staying asleep?" (.645), "Have you ever experienced a period of two weeks or more during unexpected noises startled you more than usual?" (.574), "Have you ever experienced a period of two weeks or more during you found yourself suddenly feeling very anxious, fearful, or panicky?" (.593), and "Have you ever experienced a period of two weeks or more during little things a lot or could make you very angry?" (.660). They answered "yes" or "no" to each question. The scores were initially summated as 0 to 6. Then, the measures were recoded as a dichotomous variable where 0 refers to experiencing no hyperarousal symptom and 1 refers to for experiencing at least one

hyperarousal symptom. The factor loadings for these questions are acceptable with a reliability coefficient (α) of .674.

Table 3 summarizes the descriptive statistics for PTSD clusters. In the sample, approximately 35 percent of the surveyed youths reported experiencing re-experiencing symptom, 47.7 percent youths reported experiencing avoidance/numbing symptoms and 45.17 percent respondents experienced hyperarousal symptoms. Finally, 63.23 percent of the surveyed youths reported that they had experienced at least one of the PTSD symptoms.

Table 3

Summary of Descriptive Statistics for PTSD Clusters

<u>PTSD</u>		<u>N</u>	<u>%</u>	<u>Mean</u>	<u>S.D.</u>
Re-experiencing	Yes (1)	1384	34.72%	0.35	0.48
	No (0)	2602	65.28%		
Avoidance & Numbing	Yes (1)	1879	47.70%	0.48	0.50
	No (0)	2060	52.30%		
Hyperarousal	Yes (1)	1796	45.17%	0.45	0.50
	No (0)	2180	54.83%		
PTSD	Yes (1)	2454	63.23%	0.63	0.48
	No (0)	1427	36.77%		

Independent Variables. Agnew's general strain theory articulates that criminal victimization is an important example of strains from the presentation of negative or noxious stimuli. Measures of exposure to violent victimization include sexual and physical victimization and witnessing violence.

Sexual assault. The respondents were asked a series of five questions about whether they had experienced various forms of sexual assault during their life up to the point of the interview. The respondents provided information about sexual victimization, including unwanted sexual contact by another person. They were asked: "Has a man or a boy ever put a sexual part of his body inside your private sexual parts, inside your rear end or inside your mouth when you didn't want them to?" (.576), "Has anyone, male or female, ever put fingers or objects inside your private sexual parts or inside your rear end when you didn't want them to?" (.652), "Has anyone, male or female, ever put their mouth on your private sexual parts when you didn't want them to?" (.635), "Has anyone, male or female, ever touched your private sexual parts when you didn't want them to?" (.709), and "Has anyone ever made you touch their private sexual parts when you didn't want them to?" (.687). They answered "yes" or "no" to each question. The scores were initially summated as 0 to 5. Then, the measures were recoded as a dichotomous variable where 0 refers to experiencing no sexual assault and 1 refers to experiencing at least one sexual assault. The factor loadings for these questions are acceptable with a reliability coefficient (α) of .632.

Physical assault. The respondents were asked a series of five questions about whether they had experienced various forms of the physical assault during their life up to the point of the interview. The respondents provided information about physical victimization, including being attacked by another person with or without weapons. They were asked: “Has anyone, including family members or friends, ever attacked you with a gun, knife, or some other weapons, regardless of when it happened or whether you ever reported to the police?” (.657), “Has anyone, including family members or friends, ever physically attacked you without a weapon, but you thought they were trying to kill or seriously injure you?” (.656), “Has anyone, including family members or friends, ever threatened you with a gun or knife, but didn’t actually shoot or cut you?” (.617), “Has anyone, including family members or friends, ever beat you up, attacked you, or hit you with something like a stick, club, or bottle so hard that you were hurt pretty bad?” (.661), and “Has anyone, including family members or friends, ever bet you up with their fists so hard that you were hurt pretty bad?” (.617). They answered “yes” or “no” to each question. The scores were initially summated as 0 to 5. Then, the measures were recoded as a dichotomous variable where 0 refers to experiencing no physical assault and 1 refers to experiencing at least one physical assault. The factor loadings for these questions are acceptable with a reliability coefficient (α) of .638.

Witnessing violence. The respondents were asked a series of six questions about whether they had witnessed various forms of the violence at home or in their community during their life up to the point of the interview. The respondents provided information about

witnessing violence, including witnessing someone is shooting or injured by another person. They were asked: “Have you ever seen someone actually shoot someone else with a gun?” (.534), “Have you ever seen someone actually cut or stab someone else with a knife?” (.677), “Have you ever seen someone being sexually assaulted or raped?” (.313), “Have you ever seen someone being mugged or robbed?” (.615), “Have you ever seen someone threaten someone else with a knife, a gun, or some other weapon?” (.723), and “Have you ever seen someone beaten up, hit, punched, or kicked such that they were hurt pretty badly?” (.558). They answered “yes” or “no” to each question. The scores were initially summated as 0 to 6. Then, the measures were recoded as a dichotomous variable where 0 refers to witnessing no violence and 1 refers to witnessing at least one violent incident. The factor loading for these questions are mostly acceptable with a reliability coefficient (α) of .598.

Table 4 summarizes the descriptive statistics for the independent and dependent variables. It indicates that 57.49 percent of the respondents surveyed admitted that they were involved in inner-directed response, and 13.28 percent of the respondents admitted their involvement in outer-directed response. Only 8.12 percent of the youths surveyed reported that they had been sexually assaulted, and 18.24 percent of the respondents reported that they had been physically attacked. Approximately, 73 percent of the youths admitted witnessing violence.

Table 4

Summary of Descriptive Statistics for Independent, and Dependent Variables

<u>Variable</u>		<u>N</u>	<u>%</u>	<u>Mean</u>	<u>S.D.</u>
Sexual Assault	Yes (1)	321	8.12%	0.08	0.27
	No (0)	3633	91.88%		
Physical Assault	Yes (1)	731	18.24%	0.18	0.39
	No (0)	3276	81.76%		
Witnessing Violence	Yes (1)	2924	73.30%	0.73	0.44
	No (0)	1065	26.70%		
Inner-directed Response	Yes (1)	2307	57.49%	0.58	0.49
	No (0)	1706	42.51%		
Outer-directed Response	Yes (1)	532	13.28%	0.13	0.34
	No (0)	3473	86.72%		

Control Variables. The control variables include the following demographic variables: age, gender, race/ethnicity, family socioeconomic status, and two theoretical variables of delinquent peers and lifetime strain.

Age. Age is related to the juvenile delinquency and mental health problem. Early onset of offending predicts stable and continuous engagement in juvenile crime and heavy dependence on alcohol and illicit drugs (Piquero & Chung, 2001; Kilpatrick et al., 2000; 2003). Also, Kilpatrick and colleagues (2000; 2003) suggested that children's early experience of sexual

and physical assault and witnessing violence are more significant predictors of PTSD than later exposure to such violence. In this study, the participants were asked their age at the point of interview. The respondents' age ranges from 12 to 17.

Gender. Research on general strain theory has found gender differences in delinquency, revealing that male adolescents are more likely to engage in delinquent activities than female youths (Baron, 2004; Lin & Miecckowski, 2011; Mazerolle et al., 2000; Moon et al., 2009; Morash & Moon, 2007). Given the fact that crime and delinquency by males are higher than females, researchers explain that gender differences result from the difference in exposure to strains: while some argue that females and males experience approximately the same level of strains (Aseltine Jr. et al., 2000; Broidy, 2001; Jang & Johnson, 2003), others contend males tend to respond more to interpersonal strains (Morash & Moon, 2007) and actively respond to anger (Broidy & Agnew, 1997). Based upon prior research, female and male adolescents may respond differently to exposure to violence, either emotionally (negative affect) or behaviorally (crime and substance). By adding gender as a control variable, this study will see how males and females are dissimilar in exhibiting PTSD symptoms and engaging in crime and substance use. Gender is coded as 0 for female and 1 for male.

Race/ethnicity. Race is an important control variable in this study. Research suggests that African Americans are more aggressive than others (Agnew, 1999), so that they are more likely to engage in violent crimes (Jang & Johnson, 2003). Compared to Whites, Black students have higher rates of problems at school (Thernstrom & Thernstrom, 2003), experience

discrimination (Hoskin, 2011), and are more likely to experience family conflicts, such as parents' divorce and growing in single-parent household (Cherlin, 2009; Simons et al., 2003). According to the analyses of Akins, Smith and Mosher (2010), although peer relationship is significant across all races, a negative parental relationship is a key indicator of alcohol abuse among African Americans. Strain and negative emotions are salient predictors of alcohol disorder for Whites. Alcohol abuse for Hispanic is associated with most of the strain, but the effects are relatively lower than those of Whites and Blacks. Compared to Whites and African American, Hispanics have a lower level of strain (Rodriguez & Belshaw, 2010). Hispanics who reside in a high Hispanic population community are vulnerable to commit violent crimes when they experience discrimination (Perez et al., 2008). In the original measure of race, there were six race or ethnic categories: Caucasian, African American, Hispanic, Native American, Asian, and other. Five separate dummy variables for African American, Hispanic, Native American, Asian, and Other race were created, where Caucasian was used as the omitted (or reference) category.

Family socioeconomic status (SES). Economic deprivation, unemployment and underemployment can cause strain for some individuals, especially minorities (Massey & Denton, 1993; Williams & Collins, 1995; Wilson, 1987; 1996). The race/ethnicity may be interrelated to the economic status, and impoverishment is related to delinquent behavior (Akins et al., 2003; Barr et al., 1993). An increased income substantially decreases alcohol-related problems and drug use for black males (Barr et al., 1993). Family SES was measured by

the total 1994 income of all members of the household, before taxes and other payroll deductions. The original data had a categorical variable for family income with values ranging \$5,000 or less, from \$5,000 to \$10,000, from 10,000 to \$20,000, from \$20,000 to \$30,000, \$30,000 to \$40,000, from \$40,000 to \$50,000, from \$50,000 to \$75,000, from \$75,000 to \$100,000, more than \$100,000. According to the U.S. Department Health and Human Services, the poverty level in 1995 was around \$15,000. Based on the poverty index, family income was recoded into a dichotomous variable where 1 refers to participants living below the poverty level and 2 refers to participants living above the poverty level.

Delinquent peers. In the revised version of GST (Agnew, 1992), the association with deviant peers is one of the conditioning factors that influence violent responses to strain. In many prior studies, it is suggested that the association with delinquent peers has the strongest conditioning effect (Agnew & White, 1992; Bao et al., 2004; Baron, 2004; Mazerolle & Piquero, 1997; 1998; Mazerolle et al., 2000; 2003; Moon et al., 2009). This is largely because individuals learn and follow their delinquent friends' beliefs and behavior pattern about antisocial activities. Agnew adopts this concept from Akers' social learning process. In this study, the respondents were asked a series of ten questions about whether their friends have engaged in deviant behavior in the past 12 months, including engaging in violent and property crimes. The respondents were asked: "Have your friends ever purposely damaged or destroyed property that did not belong to them?" (.466), "Have your friends ever used marijuana or hashish?" (.775), "Have your friends ever stolen something worth less than \$5?" (.659), "Have your

friends ever hit or threatened to hit someone without any reason?" (.512), "Have your friends ever used alcohol?" (.856), "Have your friends ever broken into a vehicle or building to steal something?" (.758), "Have your friends ever sold hard drugs such as heroin, cocaine, and LSD?" (.725), "Have your friends ever stolen something worth more than \$50?" (.743), "Have your friends ever gotten drunk once in a while?" (.837), and "Have your friends ever used prescription drugs such as amphetamines or barbiturates when there was no medical need for them?" (.531). They answered "yes" or "no" to each question. The scores were initially summated as 0 to 10. Then, the measures were recoded as a dichotomous variable where 0 refers to having no delinquent peers and 1 refers to having delinquent peers who committed at least one deviant behavior. The factor loadings for these questions are mostly acceptable and the reliability coefficient is quite good ($\alpha = .842$).

Stressful life events. As one of the three types of strain in Agnew's theory, strain as the failure to achieve positively valued goals is associated with adolescents' deviant behaviors (Cheung & Cheung, 2010; Mazerolle & Piquero, 1997; 1998; Morash & Moon, 2007). The failure of achieving high scores or unfair treatment makes adolescents become stressed-out. Then, the strained adolescents may respond to strains through diverse forms of emotional or behavior outcomes. In this study, stressful life events consist of the strains as the failure to achieve positively valued goals. It is assumed that adolescents who have stressful life events may tend to engage in deviant behaviors when they exposed to violence. The respondents were asked a series of three questions about whether they had experienced various forms of stressful life

events in the past 12 months. They were asked if they had experienced (1) having to repeat a school grade (.614), (2) being suspended from school (.726), (3) getting at least one failing grade on a report card (.735). They answered “yes” or “no” to each question. The scores were initially summated as 0 to 3. Then, the measures were recoded as a dichotomous variable where 0 refers to experiencing no stressful life events and 1 refers to experiencing at least one stressful life events. The factor loadings for these questions are good, but the reliability coefficient is low ($\alpha = .435$).

Depression. A number of questions were asked about sleeping problem, change in appetite, crying spells, level of activity and suicide ideation (Brezina, 1996; Manasse & Ganem, 2009; Lin et al., 2011). Most established standardized depression inventories combine measures of suicide ideation with the other items (*DSM-V*; 5th ed. American Psychiatric Association, 2013; National Institute of Mental Health). However, the current study follows and creates the indices for PTSD based on *DSM-IV* (APA, 1994). Three depressive symptom measures did not fit within the three PTSD clusters, so they were considered as a control variable measuring depression. The respondents were asked a series of three questions about whether they had experienced depressive symptoms during their life up to the point of the interview. They were asked: “Have you ever been a period of two weeks or more when you were feeling depressed, down, or irritable most of the day, nearly every day?” (.691), “Have you ever been a period of two weeks or more you felt like you wanted to die?” (.813), and “Have you ever felt so low that you thought of committing suicide?” (.829). They answered “yes” or

“no” to each question. The scores were initially summated as 0 to 3. Then, the measures were recoded as a dichotomous variable where 0 refers to experiencing no depressive symptom and 1 refers to experiencing at least one depressive symptom. The factor loadings for these questions are good, and the reliability coefficient is acceptable ($\alpha = .643$).

Data Analysis Plan

Factor analysis³ was conducted to determine the factor loadings among the variables in question. The factor loading for each question describes the variability among variables, and how much a factor explains a variable in the factor analysis. A reliability coefficient for each scale was calculated. The results show the accuracy of a test by measuring the average correlation of all items in the scale.

Next, correlation analyses were conducted between independent and dependent variables and control variables. This analysis was done to assess the strength and expected direction of the relationships among the variables and determine the presence of possible multi-collinearity, especially among the three PTSD clusters. Table 4 shows the correlation among variables. The results show the statistical relationships among the variables used in this study.

Finally, because the study focused on the prevalence of crime and alcohol and drug use, logistic regression analysis was used as the standard choice for analysis of dichotomous outcome variables (DeMaris, 1995). A series of logistic regression analyses was conducted to

³ A varimax rotation was used. The formula is

$$V = \frac{1}{p} \sum_{j=1}^m \left\{ \sum_{i=1}^p (r_{ij}^*)^4 - \frac{1}{p} \left(\sum_{i=1}^p (r_{ij}^*)^2 \right)^2 \right\}$$

examine the relationship between physical assault, sexual assault, witnessing violence and deviant behaviors and the mediating effects of PTSD on this relationship using SPSS. Logistic regression is useful to predict the odds of engaging in property and violent crime, and substance abuse based on the values of exposure to violence, as well as to test the hypotheses in this study.

In the first stage of the analysis, the direct effects of experiencing or witnessing physical assault and experiencing sexual assault on crime and alcohol and drug use will be examined. The two measures of crime (property and violence) and alcohol and drug use were regressed on experiencing or witnessing physical assault and experiencing sexual assault along with the control variables (age, gender, race, family SES, lifetime strain, and delinquent peers).

In the second stage, the measures of PTSD (the overall scale and the three individual clusters) were added to the model individually to examine the mediating role of PTSD on the relationship between exposure to violence and deviant behavior, as stated in the second hypothesis. This model will permit us to examine whether PTSD can explain why experiencing or witnessing physical assault and experiencing sexual assault is linked to crime and substance use. Based upon the literature, it is plausible that the reasons why adolescents who have victimized experiences and a high level of PTSD are associated with deviant behaviors. It is because the strain from exposure to violence may influence on adolescents' PTSD which, in turn, could result in a higher probability of engaging in delinquency and substance use. That is,

PTSD should mediate the relationship between experiencing or witnessing physical assault and experiencing sexual assault, and crime and substance use.

Finally, the third stage of the analyses examines further the mediating role of PTSD. Here, each measure of PTSD (i.e., the overall scale and the three individual subscales) is treated as an endogenous variable and is regressed on the victimization measures and control variables. In this context, it is plausible that adolescents who have experienced or witnessed physical assault and experienced sexual assault have higher level of PTSD than those who do not have such experiences. Also, some victimized adolescents may be more likely to develop certain aspects of PTSD than others. If so, experiencing or witnessing physical assault may increase hyperarousal, while experiencing sexual assault may increase the level of re-experiencing and/or avoidance and numbing behaviors.

Chapter IV

Results

To begin, an examination of the correlation matrix will allow us to determine the strength, direction and significance of the relationships among the variables. In doing so, concerns about multicollinearity among the PTSD clusters will be addressed specifically. Table 5 presents the correlations among the variables of interest in this study. Experiencing sexual assault and physical assault and witnessing violence were each significantly and positively correlated with each other. Re-experiencing, avoidance/numbing, and hyperarousal were each significantly and positively correlated with each other. The correlations among the three PTSD clusters ranged between 0.408 and .0524. A test for multicollinearity was conducted to determine if there are any collinearity concerns among the three PTSD clusters. Table 6 presents the results of the multicollinearity tests. In all three columns, the Variance Inflation Factor (VIF) ranged from 1.198 to 1.378.⁴ In this case, there is no evidence of collinearity. The three forms of violent victimization and the three PTSD clusters were each significantly and positively correlated with each other. The three forms of violent victimization, the three PTSD clusters, and a number of the control variables (age, African American, Asian, family SES, delinquent peers, and stressful life events) were significantly correlated with inner-directed response. The three forms of violent victimization, the three PTSD clusters, and all of the control variables except for the Asian dummy variable were significantly associated with outer-directed response.

⁴ When a VIF is greater than 2.50, it is necessary to think about collinearity issue.

Table 5

Correlations between Independent, Dependent and Control variables

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
1																	
.197**	1																
.115**	.231**	1															
.189**	.253**	.222**	1														
.217**	.271**	.273**	.420**	1													
.193**	.257**	.253**	.408**	.524**	1												
.139**	.220**	.320**	.225**	.320**	.291**	1											
.115**	.114**	.161**	.095**	.159**	.117**	.260**	1										
-.185**	.088**	.091**	-.090**	-.090**	-.071**	.073**	.0021	1									
.057**	.075**	.100**	.063**	.054**	.051**	.025	-0.02	-0.01	1								
0.028	0.022	.038*	.036*	.048**	.054**	0.03	-0.01	-0.02	-.133**	1							
0.022	0.031	0.021	0.03	0.03	0.024	0.022	-0.01	-0	-.076**	-.061**	1						
-0.003	-0.03	-0.02	-0	-0.02	-0.03	-0	-0.03	-0.02	-.053**	-.043**	-0.024	1					
-.063**	-.074**	-.060**	-.068**	-.039*	-.054**	0.029	.044**	0.01	-.186**	-.096**	-.072**	0.01	1				
.128**	.195**	.318**	.217**	.336**	.287**	.759**	.354**	0.031	0.03	0.024	0.014	-0.01	0.015	1			
.096**	.210**	.183**	.133**	.173**	.199**	.158**	.033*	.138**	.162**	.088**	.078**	-.032*	-.181**	.145**	1		
.136**	.159**	.238**	.115**	.208**	.177**	.348**	.347**	0.013	-.061**	0.012	-0.004	-.034*	.038*	.423**	.128**	1	
.124**	.386**	.202**	.191**	.245**	.233**	.267**	.141**	.153**	.077**	.051**	.046**	-0.02	-.060**	.221**	.247**	.221**	1

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Note: (1) sexual assault, (2) physical assault, (3) witnessing violence, (4) re-experiencing, (5) avoidance & numbing, (6) hyperarousal, (7) depression, (8) age, (9) sex, (10) African American, (11) Hispanic, (12) Native American, (13) Asian, (14) family SES, (15) delinquent peers, (16) stressful life events, (17) inner-directed response, (18) outer-directed response.

The Effects of Victimization on Inner-directed Response

The first step in the analysis was to consider the direct and indirect effects of exposure to violence on inner-directed behaviors (alcohol and illicit drug use). In doing so, six models were estimated. Table 7 displays the findings of the six different logistic regression models with inner-directed response as the dependent variable. Model 1 estimates the direct effects of exposure to violence on inner-directed responses controlling for a host of other variables. Specifically, inner-directed behaviors (alcohol and illicit drug use) are regressed on exposure to sexual and physical victimization and witnessing violence, and controls for age, sex, race, family SES, delinquent peers, stressful life events, and depression. In Model 2, the overall measure of PTSD is added to the equation. This model estimates the direct and mediating effects of PTSD. In Model 3 through 5, the overall measure of PTSD is broken down into its respective clusters and each is included individually in the model to estimate their direct and mediating effects. Finally, in Model 6, the three individual PTSD clusters are added into the model simultaneously to determine the relative impact of the individual clusters in mediating the effects of exposure to violence on inner-directed responses.

Model 1 examines the direct effects of sexual assault, physical assault, and witnessing violence on inner-directed responses. This model is significant ($\chi^2=921.53$, $df=14$, $p < .001$) and the covariates showed good predictive power for inner-directed response (Nagelkerke $R^2=.337$). The results showed that experiencing sexual assault ($b=.665$) leads to a 95 percent increase in the odds of using alcohol or illicit drugs, experiencing physical assault ($b=.445$) leads to a 56

Table 6

Results for multicollinearity test

Re-experiencing			Avoidance			Hyperarousal		
	Tolerance	VIF		Tolerance	VIF		Tolerance	VIF
Hyperarousal	0.726	1.378	Re-experi.	0.835	1.198	Avoidance	0.824	1.213
Avoidance	0.726	1.378	Hyperarousal	0.835	1.198	Re-experi.	0.824	1.213

percent increase in the odds of using alcohol or illicit drugs, and witnessing violence ($b=.529$) leads to a 70 percent increase in the odds of using alcohol or illicit drugs. Among the control variables, when age ($b=.353$) is increased by one year, youths have a 42 percent increased odds of using alcohol or illicit drugs. Living in a family ($b=.312$) in which income is above the poverty level increases the odds by 37 percent of using alcohol or illicit drugs compared to those who live in a family in which income is below the poverty level. When youth associate with delinquent peers ($b=1.266$), they have a 255 percent increased odds of using alcohol or illicit drugs. The results also showed that stressful life events ($b=.369$) increases the odds by 45 percent, and depression ($b=.253$) increases the odds by 29 percent. Also, minority respondents are differentially at risk: African Americans ($b=-.748$) have a decreased odds by 53 percent compared to the reference category of Caucasians. Other categories of races are not statistically significant in this model: Hispanic ($b=-.180$), Native American ($b=-.395$), Asian ($b=-.103$), and Other Race ($b=.052$).

Table 7

Logistic Regression for Inner-directed Response

	Model 1			Model 2			Model 3					
	b	Wald	S.E.	OR	b	Wald	S.E.	OR	b	Wald	S.E.	OR
Sexual Assault	0.665	12.41	0.19	1.95***	0.513	25.51	0.20	2.10***	0.660	11.92	0.19	1.92***
Physical Assault	0.445	13.05	0.12	1.56***	0.454	12.73	0.13	1.58***	0.447	12.71	0.13	1.56***
Witnessing Violence	0.529	28.57	0.10	1.70***	0.743	14.32	0.10	1.67***	0.533	28.41	0.10	1.70***
Age	0.353	163.19	0.03	1.42***	0.349	155.41	0.03	1.42***	0.352	161.14	0.03	1.42***
Sex	-0.055	0.41	0.09	0.95	-0.040	0.20	0.09	0.96	-0.050	0.33	0.09	0.95
African American	-0.748	35.03	0.13	0.47***	-0.767	35.90	0.13	0.46***	-0.753	35.44	0.13	0.47***
Hispanic	-0.180	1.54	0.15	0.84	-0.206	1.97	0.15	0.81	-0.186	1.66	0.15	0.83
Native American	-0.395	2.91	0.23	0.67	-0.378	2.51	0.24	0.69	-0.377	2.59	0.23	0.69
Asian	-0.103	0.10	0.33	0.90	-0.118	0.13	0.33	0.89	-0.107	0.11	0.33	0.90
Other Race	0.052	0.01	0.44	1.05	0.056	0.02	0.44	1.06	0.046	0.01	0.44	1.05
Family SES	0.312	7.23	0.12	1.37***	0.344	8.59	0.12	1.41***	0.317	7.44	0.12	1.37
Delinquent Peers	1.266	81.71	0.14	3.55***	1.238	75.67	0.14	3.45***	1.268	81.36	0.14	3.55***
Stressful life events	0.369	16.40	0.09	1.45***	0.358	14.98	0.09	1.43***	0.368	16.25	0.09	1.45***
Depression	0.253	4.03	0.13	1.29*	0.250	3.80	0.13	1.28	0.253	3.96	0.13	1.29*
PTSD					0.109	1.27	0.10	1.12				
Re-experiencing									0.005	0.00	0.10	1.01
Avoidance/Numbing												
Hyperarousal												
N												
Nagelkerke R2												
Chi-square (df)												
-2 Log likelihood												

*p < .05; **p < .01; ***p < .001

Table 7

Logistic Regression for Inner-directed Response (continued)

	Model 4			Model 5			Model 6					
	b	Wald	S.E.	OR	b	Wald	S.E.	OR	b	Wald	S.E.	OR
Sexual Assault	0.752	14.68	0.20	2.12***	0.636	11.23	0.19	1.89**	0.726	13.55	0.20	2.07***
Physical Assault	0.424	11.23	0.13	1.53**	0.434	11.93	0.13	1.54**	0.441	11.68	0.13	1.55**
Witnessing Violence	0.510	25.50	0.10	1.67***	0.509	26.00	0.10	1.66***	0.507	24.74	0.10	1.66***
Age	0.351	158.45	0.03	1.42***	0.352	161.30	0.03	1.42***	0.348	154.59	0.03	1.42***
Sex	-0.044	0.25	0.09	0.96	-0.038	0.19	0.09	0.96	-0.033	0.14	0.09	0.97
African American	-0.754	34.95	0.13	0.47***	-0.758	35.73	0.13	0.47***	-0.768	35.94	0.13	0.46***
Hispanic	-0.195	1.79	0.15	0.82	-0.191	1.74	0.15	0.83	-0.209	2.03	0.15	0.81
Native American	-0.397	2.84	0.24	0.67	-0.419	3.22	0.23	0.66	-0.376	2.49	0.24	0.69
Asian	-0.108	0.11	0.33	0.90	-0.105	0.10	0.33	0.90	-0.114	0.12	0.33	0.89
Other Race	0.064	0.02	0.44	1.07	0.057	0.02	0.44	1.06	0.058	0.02	0.44	1.06
Family SES	0.324	7.65	0.12	1.38**	0.329	7.95	0.12	1.39**	0.342	8.47	0.12	1.41**
Delinquent Peers	1.235	75.84	0.14	3.44***	1.242	78.08	0.14	3.46***	1.229	74.50	0.14	3.42***
Stressful life events	0.346	14.04	0.09	1.41***	0.360	15.30	0.09	1.43***	0.350	14.10	0.09	1.42***
Depression	0.252	3.91	0.13	1.29*	0.241	3.62	0.13	1.27	0.245	3.66	0.13	1.28
PTSD												
Re-experiencing	0.127	1.84	0.09	1.14	0.122	1.77	0.09	1.13	-0.027	0.07	0.10	0.97
Avoidance/Numbing									0.115	1.21	0.11	1.12
Hyperarousal									0.073	0.49	0.10	1.08
N		3155				3182				3123		
Nagelkerke R2		0.339				0.335				0.339		
Chi-square (df)		913.05 (15) ***				910.50 (15) ***				904.12 (17) ***		
-2 Log likelihood		3363.99				3401.62				3329.68		

* $p < .05$; ** $p < .01$; *** $p < .001$

In Model 2, the overall scale of PTSD was added to the equation. This model is significant ($\chi^2=902.77$, $df=15$, $p < .001$) and the covariates showed good predictive power for inner-directed response (Nagelkerke $R^2=.338$). The inclusion of the overall scale of PTSD had no appreciable or significant effect on inner-directed responses. The odds of inner-directed response increased only 12 percent when youths experience re-experiencing symptoms and it is not significant. Consequently, adding the overall scale of PTSD to the equation did not affect the magnitude or significance of the exposure to violence variables. Sexual and physical assault victimization and witnessing violence exert significant, direct effects on inner-directed behaviors. The results showed that the size of the unstandardized coefficient for sexual assault decreased by 22.86 percent, but it is not significant⁵ ($z=1.0590$, $p=.2896$). For physical assault, the size of the unstandardized coefficient increased by only 2.02 percent and it is not significant ($z=1.0914$, $p=.2751$). For witnessing violence, the size of the unstandardized coefficient increased by 40.45 percent, but it is not significant ($z=1.0895$, $p=.2759$). Compared to Model 1, the size and significance of the control variables in Model 2 remained unchanged with the exception of depression ($b=.250$) which was no longer significant.

In Model 3, the first mediating variable, re-experiencing, was added to the model. This model is significant ($\chi^2=915.79$, $df=15$, $p < .001$) and the covariates showed good predictive power for inner-directed response (Nagelkerke $R^2=.337$). The inclusion of the re-experiencing cluster had no appreciable or significant effect on inner-directed responses. The odds of inner-

⁵ The Sobel test was conducted to examine whether a mediator carries the influence of a violent victimization to a DV. This test works well only in large samples. The Sobel equation is $z\text{-value} = a*b/\text{SQRT}(b^2*s_a^2 + a^2*s_b^2)$

directed response increased only 1 percent when youths experience re-experiencing symptoms and it is not significant. Consequently, adding the re-experiencing cluster to the equation did not affect the magnitude or significance of the exposure to violence variables. Sexual and physical assault victimization and witnessing violence continue to exert significant, direct effects on inner-directed behaviors. The results showed that the size of the unstandardized coefficient for sexual assault decreased by only 0.75 percent and it is not significant ($z=.1000$, $p=.9204$). For physical assault, the size of the unstandardized coefficient increased by only 0.45 percent and it is not significant ($z=.1000$, $p=.9203$). For witnessing violence, the size of the unstandardized coefficient increased by only 0.75 percent and it is not significant ($z=.1000$, $p=.9204$). Compared to Model 1, the size and significance of the control variables in Model 3 remained unchanged with the exception of family SES ($b=.32$) which became insignificant.

In Model 4, the second mediating variable, avoidance and numbing, was added to the model. This model is significant ($\chi^2=913.05$, $df=15$, $p < .001$) and the covariates showed good predictive power for inner-directed response (Nagelkerke $R^2=.339$). The inclusion of the avoidance/numbing cluster had no appreciable or significant effect on inner-directed responses. The odds of inner-directed response increased only 14 percent when youths experience avoidance and numbing symptoms and it is not significant. Therefore, adding the avoidance and numbing cluster into the equation did not alter the magnitude or significance of the exposure to violence variables. Sexual and physical assault victimization and witnessing violence continue to exert significant, direct effects on inner-directed behaviors. The results

showed that the size of the unstandardized coefficient for sexual assault increased by 13.08 percent, but it is not significant ($z=1.3983$, $p=.1620$). For physical assault, the size of the unstandardized coefficient decreased by only 4.72 percent and it is not significant ($z=1.4275$, $p=.1534$). For witnessing violence, the size of the unstandardized coefficient decreased by only 3.59 percent and it is not significant ($z=1.4190$, $p=.1559$). Compared to Model 1, the size and significance of the control variables in Model 4 remained unchanged.

In Model 5, the third mediating variable, hyperarousal, was added to the model. This model is significant ($\chi^2=910.50$, $df=15$, $p < .001$) and the covariates showed good predictive power for inner-directed response (Nagelkerke $R^2=.335$). The inclusion of the hyperarousal cluster had no appreciable or significant effect on inner-directed responses. The odds of inner-directed response increased only 13 percent when youths experience re-experiencing symptoms and it is not significant. Consequently, adding the hyperarousal cluster to the equation did not affect the magnitude or significance of the exposure to violence variables. Sexual and physical assault victimization and witnessing violence continue to exert significant, direct effects on inner-directed behaviors. The results showed that the size of the unstandardized coefficient for sexual assault decreased by only 4.36 percent and it is not significant ($z=1.2804$, $p=.2004$). For physical assault, the size of the unstandardized coefficient decreased by only 2.47 percent and it is not significant ($z=1.3160$, $p=.1882$). For witnessing violence, the size of the unstandardized coefficient decreased by only 3.78 percent and it is not significant ($z=1.3110$, $p=.1898$). Compared to Model 1, the size and significance of the control

variables in Model 5 remained unchanged with the exception of depression ($b=.241$) which was no longer significant.

In Model 6, the three PTSD clusters were added to the model all together. This model is significant ($\chi^2=904.12$, $df=17$, $p < .001$) and the covariates showed good predictive power for inner-directed response (Nagelkerke $R^2=.339$). The inclusion of the three PTSD clusters had no appreciable or significant effects on inner-directed responses. The odds of inner-directed response decreased 3 percent when youths experience re-experiencing symptoms, the odds increased only 12 percent when youths experience avoidance and numbing symptoms, and the odds increased only 8 percent when youths experience hyperarousal. The changes in the magnitudes of the unstandardized coefficients are not significant. Therefore, adding the three PTSD clusters into the equation did not alter the magnitude or significance of the exposure to violence variables. Sexual and physical assault victimization and witnessing violence continued to exert significant, direct effects on inner-directed responses. After the addition of the three mediating variables, there was a 9.17 percent increase in the size of the unstandardized coefficient for sexual assault, a 0.90 percent decrease in the size of the unstandardized coefficient for physical assault, and a 4.16 percent decrease in the size of the unstandardized coefficient for witnessing violence. Compared to Model 1, the size and significance of the control variables in Model 6 remained unchanged with the exception of depression ($b=.245$) which became insignificant.

In sum, as the three mediators were added to the model, the direct relationships between the exposure to violence variables and inner-directed response remained relatively stable and statistically significant. There are no significant mediating effects of overall PTSD or the three individual PTSD clusters involving the relationship between exposure to violence and inner-directed response. Experiencing sexual and physical assault and witnessing violence retained their significance in all six models. Age, being African American, family SES, delinquent peers and stressful life events also remained significant. Sex and other race dummy variables never attained significance. The significance of depression changed marginally across the different models.

The Effects of Victimization on Outer-directed Response

The first step in the analysis was to examine the direct and indirect effects of exposure to violence on outer-directed behaviors (property and violent crime). In doing so, six models were estimated. Table 8 displays the findings of six different logistic regression models with outer-directed response as the dependent variable. Model 1 estimates the direct effects of exposure to violence on outer-directed responses controlling for a host of other variables. Specifically, outer-directed behaviors (property and violent crime) are regressed on sexual assault, physical assault and witnessing violence, and controls for age, sex, race, family SES, delinquent peers, stressful life events, and depression. In Model 2, the overall measure of PTSD is added to the equation. This model estimates the direct and mediating effects of PTSD. In Model 3 through 5, the overall measure of PTSD is broken down into its respective clusters, and

each is included individually in the model to estimate their direct and mediating effects. Finally, in Model 6, the three individual PTSD clusters are added into the model simultaneously to determine the relative impact of the individual clusters in mediating the effects of exposure to violence on outer-directed responses.

Model 1 examines the direct relationship between sexual assault, physical assault, witnessing violence and outer-directed response. This model is significant ($\chi^2=785.87$, $df=14$, $p < .001$) and the covariates showed good predictive power for outer-directed responses (Nagelkerke $R^2=.397$). The results showed that experiencing sexual assault ($b=.539$) leads to a 72 percent increase in the odds of engaging in property or violent crime, experiencing physical assault ($b=1.554$) leads to a 373 percent increase in the odds of engaging in property or violent crime, and witnessing violence ($b=1.223$) leads to a 240 percent increase in the odds of engaging in property or violent crime. Among the control variables, when age ($b=.163$) is increased by one year, youths have an 18 percent increased odds of engaging in property or violent crime. Being a male ($b=1.037$) increases the odds by 181 percent. When youths associate with delinquent peers ($b=.922$), they have a 152 percent increased odds of committing a property or violent crime. The results also showed that stressful life events ($b=1.120$) increases the odds by 207 percent, and depression ($b=1.242$) increases the odds by 246 percent. In addition, race/ethnicity variable increase the odds of engaging in property or violent crime. In particular, Hispanics ($b=.468$) have an increased odds by 60 percent compared to the reference category of Caucasians. Other categories of races are not statistically

Table 8

Logistic Regression for Outer-directed Response

	Model 1			Model 2			Model 3					
	b	Wald	S.E.	OR	b	Wald	S.E.	OR	b	Wald	S.E.	OR
Sexual Assault	0.539	21.67	0.19	1.72**	0.501	6.65	0.19	1.65*	0.495	6.64	0.19	1.64*
Physical Assault	1.554	152.32	0.13	4.73***	1.391	114.93	0.13	4.02***	1.477	132.38	0.13	4.38***
Witnessing Violence	1.223	21.67	0.26	3.40***	1.190	18.11	0.28	3.29***	1.157	19.22	0.26	3.18***
Age	0.163	15.57	0.04	1.18***	0.159	14.26	0.04	1.17***	0.163	15.49	0.04	1.18***
Sex	1.037	57.21	0.14	2.82***	1.104	61.76	0.14	3.02***	1.076	59.68	0.14	2.93***
African American	0.294	3.09	0.17	1.34	0.263	2.40	0.17	1.30	0.268	2.54	0.17	1.31
Hispanic	0.468	6.00	0.19	1.60*	0.492	6.36	0.20	1.64*	0.450	5.48	0.19	1.57*
Native American	0.535	3.31	0.29	1.71	0.449	2.17	0.31	1.57	0.506	2.85	0.30	1.66
Asian	0.523	1.12	0.50	1.69	0.535	1.14	0.50	1.71	0.557	1.25	0.50	1.75
Other Race	0.315	0.28	0.59	1.37	0.371	0.39	0.60	1.45	0.278	0.22	0.60	1.32
Family SES	-0.156	1.00	0.16	0.86	-0.108	0.46	0.16	0.90	-0.144	0.85	0.16	0.87
Delinquent Peers	0.922	5.58	0.39	2.52*	0.773	3.77	0.40	2.17	0.907	5.37	0.39	2.48*
Stressful life events	1.120	67.76	0.14	3.07***	1.126	64.81	0.14	3.08***	1.105	65.18	0.14	3.02***
Depression	1.242	23.46	0.26	3.46***	1.206	20.60	0.27	3.34***	1.202	21.76	0.26	3.33***
PTSD					0.840	20.73	0.19	2.32***				
Re-experiencing									0.389	9.03	0.13	1.48**
Avoidance/Numbing												
Hyperarousal												
N		3205				3123				3186		
Nagelkerke R2		0.397				0.402				0.399		
Chi-square (df)		785.87 (14) ***				768.18 (15) ***				782.23 (15) ***		
-2 Log likelihood		1756.01				1675.46				1735.56		

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 8

Logistic Regression for Outer-directed Response (continued)

	<u>Model 4</u>			<u>Model 5</u>			<u>Model 6</u>					
	b	Wald	S.E.	OR	b	Wald	S.E.	OR	b	Wald	S.E.	OR
Sexual Assault	0.434	5.01	0.19	1.54*	0.460	5.74	0.19	1.59*	0.403	4.21	0.20	1.50*
Physical Assault	1.381	114.26	0.13	3.34***	1.433	124.31	0.13	4.19***	1.318	99.97	0.13	3.74***
Witnessing Violence	1.205	18.45	0.28	3.98***	1.125	17.79	0.27	3.08***	1.153	16.65	0.28	3.17***
Age	0.155	13.61	0.04	1.17***	0.160	14.64	0.04	1.17***	0.152	12.87	0.04	1.17***
Sex	1.183	69.69	0.14	3.26***	1.139	66.10	0.14	3.12***	1.204	70.14	0.14	3.33***
African American	0.284	2.78	0.17	1.33	0.267	2.47	0.17	1.31	0.258	2.23	0.17	1.29
Hispanic	0.513	6.97	0.19	1.67**	0.487	6.38	0.19	1.63*	0.493	6.35	0.20	1.64*
Native American	0.504	2.79	0.30	1.66	0.570	3.69	0.30	1.77	0.475	2.40	0.31	1.61
Asian	0.612	1.50	0.50	1.84	0.562	1.24	0.50	1.76	0.630	1.58	0.50	1.88
Other Race	0.411	0.47	0.60	1.51	0.349	0.34	0.60	1.42	0.398	0.44	0.60	1.49
Family SES	-0.105	0.44	0.16	0.90	-0.126	0.64	0.16	0.88	-0.089	0.31	0.16	0.92
Delinquent Peers	0.722	3.26	0.40	2.06	0.841	4.53	0.40	2.32*	0.714	3.17	0.40	2.04
Stressful life events	1.119	64.34	0.14	3.06***	1.064	58.95	0.14	2.90***	1.075	57.68	0.14	2.93***
Depression	1.235	21.52	0.27	3.44***	1.199	21.23	0.26	3.32***	1.197	20.02	0.27	3.31***
PTSD												
Re-experiencing									0.109	0.62	0.14	1.12
Avoidance/Numbing	0.858	34.09	0.15	2.36***					0.609	13.60	0.17	1.84***
Hyperarousal					0.773	31.00	0.14	2.17***	0.490	9.64	0.16	1.63**
N		3155				3182				3123		
Nagelkerke R2		0.412				0.41				0.413		
Chi-square (df)		803.74 (15) ***				808.23 (15) ***				792.79 (17) ***		
-2 Log likelihood		1682.76				1708.41				1650.86		

*p < .05; **p < .01; ***p < .001

significant in this model: African American ($b=.294$), Native American ($b=.535$), Asian ($b=.523$), and Other Race ($b=.315$). Living in a family ($b=-.156$) in which income is above the poverty level decreases the odds by 14 percent of engaging in property or violent crime compared to those who live in a family in which income is below the poverty level; yet, it is not significant.

In Model 2, the overall scale of PTSD was added to the equation. This model is significant ($\chi^2=765.18$, $df=15$, $p < .001$) and the covariates showed good predictive power for outer-directed responses (Nagelkerke $R^2=.402$). The inclusion of the overall scale of PTSD ($b=.84$) had an appreciable or significant effect on outer-directed responses. The odds of outer-directed responses increased 132 percent when youths experience at least one PTSD symptom, and it is significant. Adding the overall scale of PTSD to the equation slightly reduced the magnitude of the exposure to violence variables. However, sexual and physical assault victimization and witnessing violence continue to exert significant, direct effects on outer-directed behaviors. The results showed that the size of the unstandardized coefficient for sexual assault decreased by 7.05 percent, and it is significant ($z=2.9317$, $p=.0034$). For physical assault, the size of the unstandardized coefficient decreased 10.49 percent, and it is significant ($z=3.9444$, $p=.0001$). For witnessing violence, the size of the unstandardized coefficient decreased by 2.70 percent, and it is significant ($z=3.8580$, $p=.0001$). Compared to Model 1, the magnitude and significance of the control variables in Model 2 remained unchanged with the one exception of delinquent peers ($b=.773$) which was no longer significant.

In Model 3, the first mediating variable, re-experiencing, was added to the model. This model is significant ($\chi^2=782.23$, $df=15$, $p <.001$) and the covariate showed good predictive power for outer-directed responses (Nagelkerke $R^2=.399$). The inclusion of the re-experiencing cluster had an appreciable or significant effect on outer-directed responses. The odds of outer-directed responses increased 48 percent when youths exhibit re-experiencing symptoms, and it is significant. Adding the re-experiencing cluster to the equation reduced slightly the size of the unstandardized coefficients among the exposure to violence variables. However, sexual and physical assault victimization and witnessing violence continue to exert significant, direct effects on outer-directed behaviors. The results showed that the size of the unstandardized coefficient for sexual assault decreased significantly ($z=2.4904$, $p=.0128$) by 8.16 percent. For physical assault, the size of the unstandardized coefficient decreased only 4.96 percent, but it is a significant reduction ($z=2.8580$, $p=.0043$). For witnessing violence, the size of the unstandardized coefficient decreased significantly ($z=2.7682$, $p=.0056$) by 5.40 percent. Compared to Model 1, the magnitude and significance of the control variables in Model 3 remained unchanged.

In Model 4, the second mediating variable, avoidance and numbing, was added to the model. This model is significant ($\chi^2=803.74$, $df=15$, $p <.001$) and the covariate showed good predictive power for outer-directed responses (Nagelkerke $R^2=.412$). The inclusion of the avoidance/numbing cluster had an appreciable and significant effect on outer-directed responses. The odds of outer-directed responses increased significantly by 136 percent when

youths experience avoidance and numbing symptoms. Adding the avoidance/numbing cluster to the equation reduced slightly the magnitude of experiencing sexual and physical assault, and witnessing violence. However, sexual and physical assault victimization and witnessing violence continue to exert significant, direct effects on outer-directed behaviors. The results showed that the size of the unstandardized coefficient for sexual assault decreased by 19.48 percent, and it is significant ($z=3.9984$, $p=.0001$). For physical assault, the size of the unstandardized coefficient decreased 11.13 percent, and it is significant ($z=4.8852$, $p=.0000$). For witnessing violence, the size of the unstandardized coefficient decreased only 1.47 percent, but it is a significant reduction ($z=4.5770$, $p=.0000$). Compared to Model 1, the size and significance of the control variables in Model 4 remained unchanged with the exception of delinquent peers ($b=.722$) which became insignificant.

In Model 5, the third mediating variable, hyperarousal, was added to the model. This model is significant ($\chi^2=803.23$, $df=15$, $p < .001$) and the covariates showed good predictive power for outer-directed responses (Nagelkerke $R^2=.410$). The inclusion of the hyperarousal cluster had an appreciable and significant effect on outer-directed responses. The odds of outer-directed responses increased 117 percent when youths experience hyperarousal symptoms, and it is significant. Adding the hyperarousal cluster to the equation reduced slightly the size of the unstandardized coefficients for experiencing sexual and physical assault, and witnessing violence. However, sexual and physical assault victimization and witnessing violence remained significant, exerting direct effects on outer-directed behaviors. The results showed

that the size of the unstandardized coefficient for sexual assault decreased significantly ($z=3.5232$, $p=.0004$) by 14.66 percent. For physical assault, the size of the unstandardized coefficient decreased 7.79 percent, and it is significant ($z=4.5645$, $p=.0000$). For witnessing violence, the size of the unstandardized coefficient decreased by 8.01 percent, and it is significant ($z=4.3707$, $p=.0000$). Compared to Model 1, the magnitude and significance of the control variables in Model 5 remained unchanged.

In Model 6, the three PTSD clusters were added to the model all together. This model is significant ($\chi^2=792.79$, $df=17$, $p < .001$) and the covariates showed good predictive power for outer-directed responses (Nagelkerke $R^2=.413$). The inclusion of the three PTSD clusters had varying effects on outer-directed responses. The odds of outer-directed response increased only 12 percent when youths experience re-experiencing symptoms ($b=.11$), but it is not significant. However, the odds of outer-directed response increased significantly by 84 percent when youths experience avoidance and numbing symptoms ($b=.61$). Additionally, the odds of outer-directed response increased significantly by 63 percent when youths experience hyperarousal symptoms ($b=.49$). Adding the three PTSD clusters together into the equation reduced slightly the magnitude of the exposure to violence variables. However, sexual and physical assault victimization and witnessing violence continue to exert significant, direct effects on outer-directed behaviors. There was a 25.13 percent decrease in the size of the unstandardized coefficient for sexual assault, a 15.18 percent decrease in the size of the unstandardized coefficient for physical assault, and a 5.72 percent decrease in the size of the

unstandardized coefficient for witnessing violence. Compared to Model 1, the size and significance of the control variables in Model 6 remained unchanged with the exception of delinquent peers ($b=.714$) which is no longer significant.

To summarize, when the mediators were added to the model, there are significant mediating effects of overall PTSD and the three individual PTSD clusters on the relationship between exposure to violence and outer-directed responses. However, the three PTSD clusters only partially mediate the linkages. The direct relationship between exposure to violence and outer-directed responses decreased slightly, but always remained significant across the six models. Age, sex, Hispanic, stressful life events, and depression also remained significant. Family SES and other race dummy variables never attained significance. The significance of delinquent peers changed marginally across the different models.

Exposure to Violence and Key Mediators

The last stage of the analyses was to examine relationships between sexual assault, physical assault, witnessing violence, and the mediating variables: re-experiencing, avoidance/numbing and hyperarousal. In Table 9, there are significant relationships between each of the exposure to violence variables and the overall PTSD measure and all of the PTSD clusters. The results show that experiencing sexual assault increases the risk of the overall scale of PTSD (155 percent), re-experiencing (94 percent), avoidance/numbing (190 percent), and hyperarousal (118 percent). Physical assault also increases the risk of the overall scale of PTSD (272 percent), re-experiencing (157 percent), avoidance/numbing (205 percent), and

hyperarousal (146 percent). Along with the two other exposure to violence variables, witnessing violence increases the risk of the overall scale of PTSD (110 percent), re-experiencing (110 percent), avoidance/numbing (113 percent), and hyperarousal (106 percent). For the control variables, sex, delinquent peers, stressful life events, and depression are significantly related to the mediators. Overall, these results combined with the previous findings indicate the exposure to violence variables exert direct and indirect effects on the outer-directed responses through their effects on overall PTSD measure and the individual PTSD clusters. It is important to note, however, that PTSD does not fully mediate the effects of exposure to violence on outer-directed behaviors. For the inner-directed responses, although the exposure to violence variables exerts direct effects on the dependent variable, there are no indirect effects through PTSD. While the exposure to violence variables influences the overall PTSD measure and the individual PTSD clusters, PTSD is unrelated to inner-directed behaviors.

Figure 2 shows the effects of violent victimization on the mediating variables and substance use. Figure 3 shows the effects of violent victimization on the mediating variables and property and violent crime. The findings are drawn from the final model where all three of the individual PTSD clusters are added.

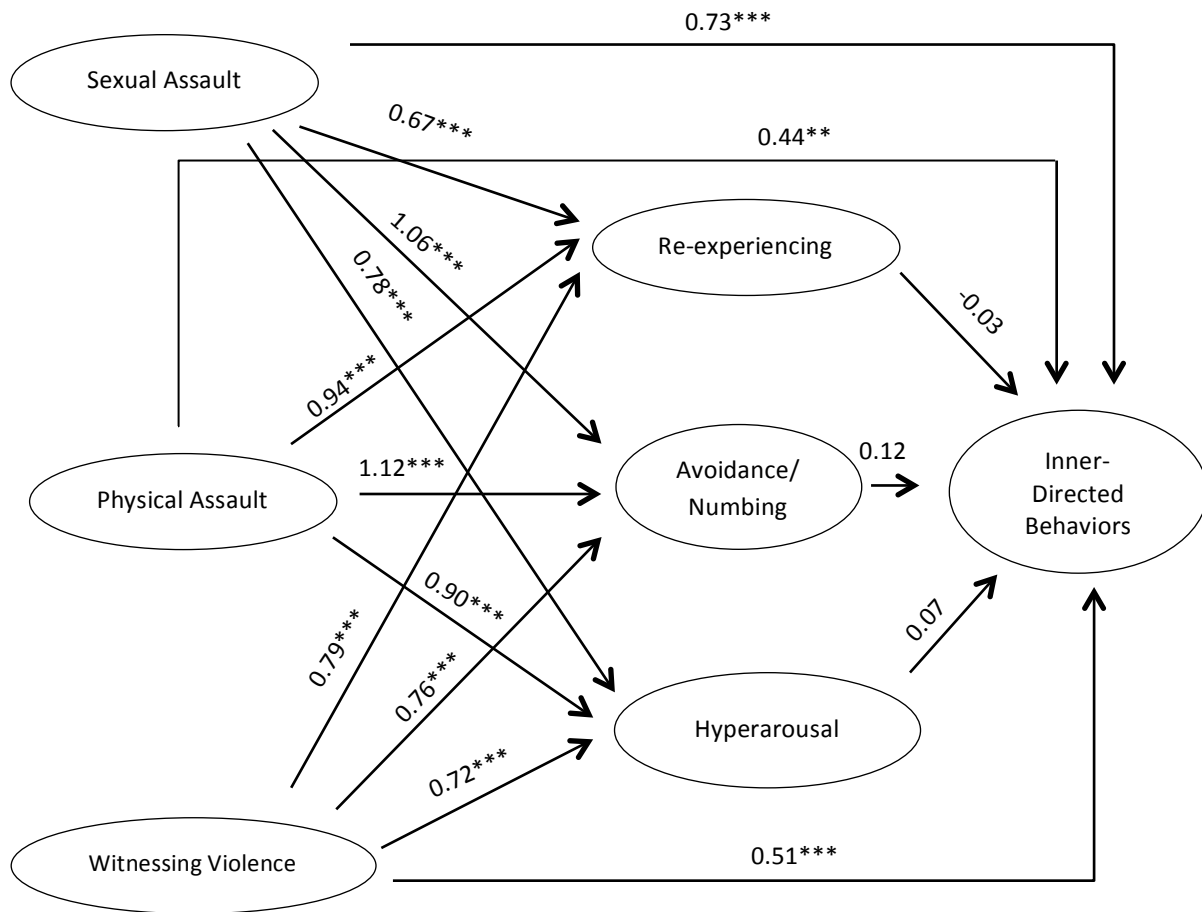
Table 9

Logistic Regression for the Mediating Effect of PTSD

	PTSD			Re-experiencing			Avoidance/Numbing			Hyperarousal						
	b	Wald	S.E.	OR	b	Wald	S.E.	OR	b	Wald	S.E.	OR				
Sexual Assault	0.938	15.37	0.24	2.55***	0.665	19.89	0.15	1.94***	1.063	31.52	0.19	2.90***	0.779	22.01	0.17	2.18***
Physical Assault	1.313	73.69	0.15	3.72***	0.943	82.37	0.10	2.57***	1.116	89.01	0.12	3.05**	0.900	65.86	0.11	2.46***
Witnessing Violence	0.787	68.16	0.10	2.20***	0.787	52.04	0.11	2.20***	0.755	55.72	0.10	2.13***	0.721	52.49	0.10	2.06***
Age	-0.013	0.23	0.03	0.99	0.020	0.56	0.03	1.02	0.035	1.77	0.03	1.04	0.007	0.07	0.03	1.01
Sex	-0.634	51.54	0.09	0.53***	-0.562	43.26	0.09	0.57***	-0.676	62.00	0.09	0.51***	-0.519	38.66	0.08	0.60***
African American	0.1	0.56	0.13	1.11	0.131	1.21	0.12	1.14	0.096	0.60	0.12	1.10	0.028	0.05	0.12	1.03
Hispanic	0.073	0.24	0.15	1.08	0.007	0.00	0.14	1.01	0.109	0.60	0.14	1.12	0.139	1.05	0.14	1.15
Native American	0.079	0.10	0.25	1.08	0.209	0.91	0.22	1.23	0.079	0.12	0.23	1.08	-0.074	0.11	0.22	0.93
Asian	0.004	0.00	0.33	1.00	-0.052	0.03	0.33	0.95	-0.203	0.38	0.33	0.82	-0.172	0.29	0.32	0.84
Other Race	-0.609	2.19	0.41	0.54	-0.105	0.06	0.42	0.90	-0.426	1.03	0.42	0.65	-0.331	0.65	0.41	0.72
Family SES	-0.116	0.93	0.12	0.89	-0.156	2.02	0.11	0.86	-0.027	0.06	0.11	0.97	-0.055	0.25	0.11	0.95
Delinquent Peers	0.742	28.87	0.14	2.10***	0.279	3.34	0.15	1.32	0.935	42.31	0.14	2.55***	0.592	17.21	0.14	1.81***
Stressful life events	0.397	19.09	0.09	1.49***	0.280	10.60	0.09	1.32**	0.396	20.83	0.09	1.49***	0.586	48.60	0.08	1.80***
Depression	0.565	19.87	0.13	1.76***	0.482	13.77	0.13	1.62***	0.429	12.35	0.12	1.54***	0.511	17.49	0.12	1.67***
N			3130			3194				3162				3189		
Nagelkerke R2			0.284			0.197				0.297				0.245		
Chi-square (df)			728.60(14)***			492.76 (14) ***				794.74 (14) ***				646.17 (14) ***		
-2 Log likelihood			3388.84			3630.74				3581.61				3743.56		

* $p < .05$, ** $p < .01$, *** $p < .001$

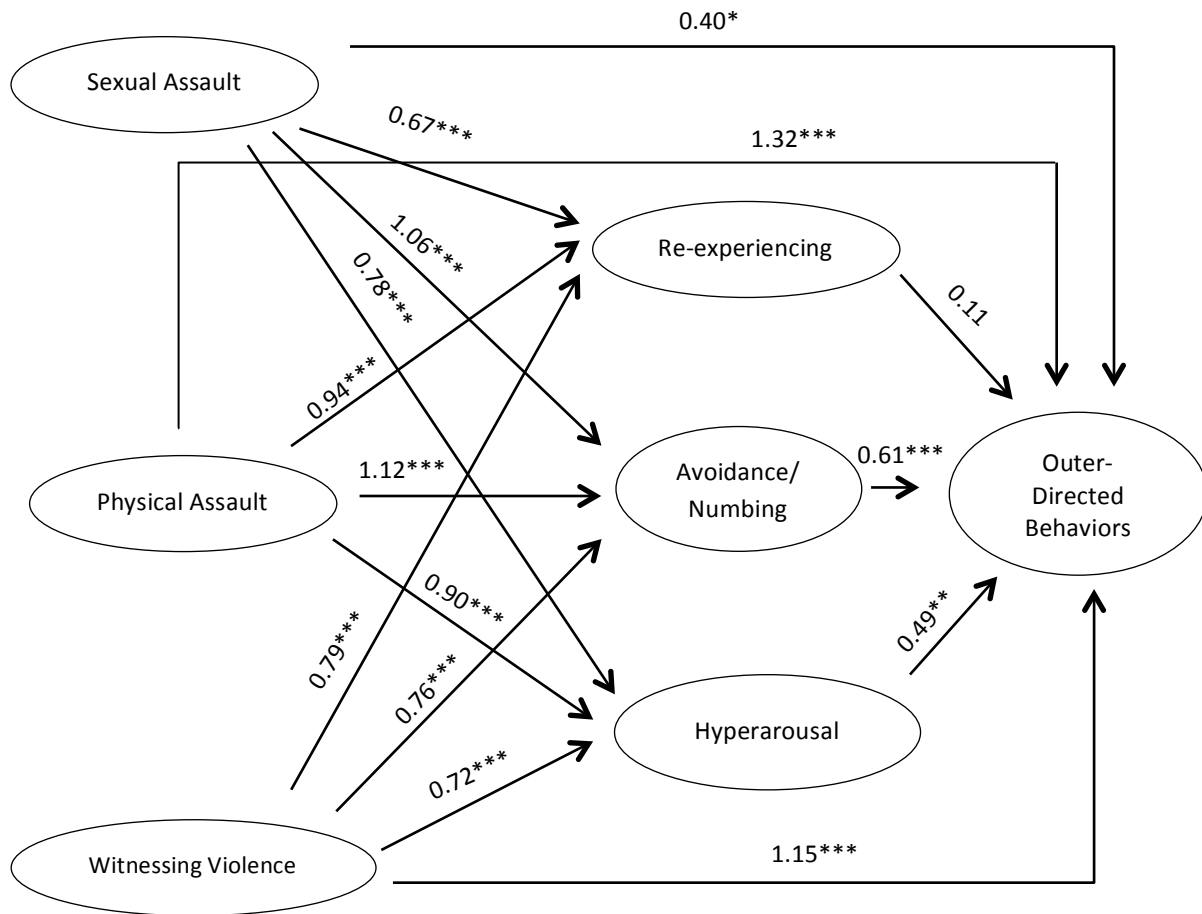
Figure 2: Inner-directed Behaviors



Note. N = 3,123. Model fit: $\chi^2 = 904.12$ (df=17, $p < .001$). Age, sex, race, family SES, delinquent peers, stressful life events, and depression were controlled in the model.

* $p < .05$; ** $p < .01$; *** $p < .001$

Figure 3: Outer-directed Behaviors



Note. N = 3,123. Model fit: $\chi^2 = 904.12$ (df=17, $p < .001$). Age, sex, race, family SES, delinquent peers, stressful life events, and depression were controlled in the model.

* $p < .05$; ** $p < .01$; *** $p < .001$

Chapter V

Discussion and Conclusion

Despite the decreasing trends in juvenile arrest rates in the United States since the early 1990's, youths have been exposed to various forms of violence (Becker & Kerig, 2011; Hawke et al., 2009; Synder, 2006). This violence has involved physical assault, sexual assault, community violence, domestic violence and even unexpected or untimely loss. As youth experience or witness violence, they are at a higher risk of engaging in future perpetration of crime and deviant behaviors (Dixon et al., 2005; Finkelhor et al., 2009; Graham-Bermann et al., 2012; Hawke et al., 2009; Moretti et al., 2006; Ruchkin et al., 1998; 2002; Wood et al., 2002a; Zinzow et al., 2009). Additionally, the detrimental effect of such traumatic events on adolescents' mental health has been well-documented by scholars (Ariga et al., 2008; Becker & Kerig, 2011; Dixon et al., 2005; Ford et al., 2008; Gorman-Smith & Tolan, 1998; Gorman-Smith et al. 2004; Haller & Chassin, 2014; Rosenberg et al., 2014; Richards et al., 2004; Shen, 2009). Studies show that sexual assault, physical assault, and witnessing violence increase PTSD symptoms, such as avoidance and numbing, re-experiencing the traumatic event, and hyperarousal.

In 1992, Agnew introduced General Strain Theory (GST) and posited that delinquent behaviors stem from negative relationships with other people. Agnew (2001) recently argues that victimization experiences are a source of strain, which are associated with juvenile crime and substance use. Grounded within GST, the current study examined the relationship between exposure to violence and inner- (alcohol and illicit drug use) and outer-directed responses

(property and violent crime). Additionally, the theory has specified the mediating role of negative emotions or affective states in explaining the effects of the exposure to violence on juvenile crime and substance use. In particular, anger, depression and anxiety have been examined as factors for their mediating roles (Agnew, 1985; Aseltine et al., 2000; Bao et al., 2004; Brezina, 1996; Broidy, 2001; Jang & Johnson, 2003; Mazerolle & Piquero, 1997; Moon & Morash, 2013; Patchin & Hinduja, 2011; Rebellon et al., 2012). The current study expanded the notion of negative affective states, drawing upon psychological studies on violent victimization, to explore the role of post-traumatic stress disorder involving the exposure to violent victimization-juvenile crime link.

Theoretical Implications

Four key conclusions emerged from the study's findings. The first major finding was that all three forms of violent victimization are significantly related to adolescents' PTSD. As Table 8 illustrated, experiencing sexual assault and physical assault, and witnessing violence were significantly related to overall PTSD and all three of the individual PTSD clusters (re-experiencing, avoidance/numbing, and hyperarousal). These relationships were observed even when controlling for a host of variables, including age, sex, race/ethnicity, family SES, delinquent peers, stressful life events, and depression. These findings support the first hypothesis, which predicts that adolescents who experience one of the three types of violent victimization will have a higher probability of experiencing PTSD symptoms than those who do not experience such victimizations. This result is consistent with prior research in that PTSD has

been established as common mental health problems among highly traumatized populations (Boney-McCoy & Finkelhor, 1996; Kilpatrick et al., 2000, 2003). Direct violent victimization is not the only possible cause of PTSD (Allwood et al., 2011; Chen et al., 2011; Hoyt et al., 2012; Reingle-Gonzalez et al., 2014). Witnessing or observing the violent victimization of others is also associated with PTSD (Allwood et al., 2011; Graham-Bermann et al., 2012; Martin et al., 2013).

The implication of this finding is that the PTSD is an important factor in the strain-crime link. PTSD was not included in GST, so thus the impact of violent victimization on PTSD was overlooked. The findings, however, suggest that exposure to violence places youths at risk for serious mental health problems. In addition to the overall diagnosis of PTSD, the current analysis estimated the individual effects of violent victimization on the three clusters of PTSD symptoms. These results suggest that all three violent victimizations can separately lead to re-experiencing, avoidance/numbing or hyperarousal symptoms. For a better understanding the strain-crime link, GST research can be expanded by considering the mediating role of PTSD. It will make it clear how several forms of violent victimization influence PTSD symptoms that, in turn, affect delinquent behaviors. Also, the inclusion of PTSD and negative emotions may enable to recognize how PTSD is associated with negative emotion within GST.

The second major finding was that all three forms of violence exposure are found to be directly related to inner- and outer-directed behaviors. Experiencing sexual and physical assault and witnessing violence increase the likelihood of alcohol/illicit drug use and property/violent crime among adolescents. Specifically, the results of the logistic regression analyses indicate

that sexual assault has a stronger influence on inner-directed response than physical assault and witnessing violence. Individuals who reported being sexually assaulted were almost two times the risk of using alcohol or illicit drug than individuals without such violent victimization. Furthermore, the results demonstrate that physical assault and witnessing violence have stronger influences on outer-directed response than sexual assault. Individuals who reported experiencing physical assault were more than four times the risk of being involved in property or violent crime, and individuals who reported witnessing violence were more than three times the risk than those who without such victimization. These results support the second hypothesis, which predicts that adolescents who experience one of the three types of violent victimization will have a higher probability of engaging in juvenile crime and substance use than those who do not experience such victimizations. This result is also consistent with prior GST research: when adolescent were physically assaulted and witnessed violence, they are more likely to engage in property and violent crime (Agnew & White, 1992; Baron, 2004; Lin et al., 2011; Sigfusdottir et al., 2012) as well as use alcohol and illicit drug (Agnew & White, 1992; Baron, 2004; Lin et al., 2011). Consistent with psychology studies, violent victimization increases adolescents' engagement in violent crime (Ariga et al., 2008; Cisler et al., 2012; Brunelle et al., 2014; Cohen et al., 2006; Farrell & Sullivan, 2004; Finkelhor et al., 2009; Gorman-Smith et al., 2004; Haller & Chassin, 2014; Hawke et al., 2009; Rosenberg et al., 2014; Shen, 2009; Kilpatrick et al., 2000), and child sexual assault increases adolescents' use of alcohol and illicit drug (Ruchkin et al., 1998; 2002; Ullman et al., 2013).

The implication of this finding is that victimization merits greater attention in future studies as an important risk factor of juvenile crime and substance use. As Koppel predicted (1987), the population of victimized adolescents is increasing. This growing population should not be overlooked since such detrimental experiences negatively alter adolescents' lifestyle and promote juvenile crime and substance use. This is supported by numerous studies on detained juveniles, which conclude that juvenile offenders have a higher rate of exposure to violence than those who do not engaged in juvenile delinquency (Ariga et al., 2008; Becker & Kerig, 2011; Cisler et al., 2012; Haller & Chassin, 2014; Hawke et al., 2009; Rosenberg et al., 2014; Shen, 2009). Although this study treated stress life events as a control variable, the role of violent victimizations, along with the other forms of strain including stressful life events, should be explored more thoroughly in future studies.

The results concerning the three types of strain, including violent victimization, require further investigations. The longitudinal impact of the three types of strain may vary. Also, direct violent victimization may have a longer impact on juvenile crime and substance use than indirect violent victimization or vice versa. For example, Eitle (2010) surveyed 648 high school students to examine the differences between chronic strains and recent strains on deviant behaviors. Results showed that exposure to chronic and recent strains increase the probability of one's involvement in criminal activity. In a similar vein, Slocum (2010) showed that stress had proliferated over the years. Specifically, child stressors were significant risk factors for adolescents and adult stressors. Likewise, adolescent stressors are a key indicator for adult

stressors as well as criminal behaviors among adults. A study by Hoffman (2010) also indicates that exposure to stressful life events is positively associated with one's criminal behavior over the life-course. However, young adults are less likely to engage in criminal activities, suggesting the impact of stressful life events on such actions is diminished. It could be argued that young adults have developed a strategy to cope with such strains. They may cognitively avoid the source of strain, or they may try to control their negative emotional state. However, sexual assault, physical assault, and witnessing violence were excluded from these studies, except for sexual abuse in Slocum's study (2010). Although the impacts of violent victimization may diminish over time, one should continue to explore how the various forms of victimization work with youth delinquency and crime.

The third major finding was that PTSD symptoms were found to partially mediate the relationship between exposure to violence and outer-directed response. Violent victimization significantly increases the probability of exhibiting re-experiencing, avoidance/numbing, and hyperarousal symptoms, which in turn significantly increase the likelihood of adolescents' engaging in property and violent crime. The inclusion of the overall scale of PTSD increased the risk of juvenile crimes. Furthermore, all three symptom clusters were associated with increased risk. Although the direct effects of violent victimization on outer-directed response decreased slightly in each occasion as the mediators were added to the model, their effects still retained their significance. These findings indicate that PTSD symptoms only partially mediate the impact of violent victimization on the outer-directed response, at best. These results partially

support the third hypothesis, providing evidence for outer-directed behavior only. These results also are consistent with prior research on GST, demonstrating that negative emotions mediate the relationship between strains and deviant behavior (Bao et al., 2004; Brezina, 1996; Broidy, 2001; Jang & Johnson, 2003; Moon & Morash, 2013). Although Kerig and colleagues (2012) found that reexperiencing and arousal acted as mediators of the relations between trauma exposure and externalizing problems for detained juveniles, the current study found that all three PTSD clusters served as mediators when each was examined individually. Moreover, the avoidance/numbing and hyperarousal clusters continued to serve as significant mediators when all three clusters were added to the equation simultaneously.

Contrary to the hypothesis, the expected mediating role of PTSD was not seen for the relationship between violent victimization and inner-directed behavior. The present findings were also inconsistent with prior studies suggesting that PTSD symptoms increase adolescents' risk of using alcohol or illicit drugs (Allwood & Bell 2008; Epstein et al., 1998; Ruchkin et al., 2002). None of the three PTSD clusters predicted the higher risk of using alcohol or illicit drugs. It is hard to know exactly why PTSD symptoms failed to mediate the effect of violent victimization on alcohol and illicit drug use. The discrepant findings may be due the different data set. Ullman and colleagues (2013) surveyed 1,863 females, age ranging from 18 to 71 (mean=31.1, SD=12.2) to examine the effects of a variety of traumatic event in childhood on mental problems, as well as alcohol and illicit drug use. They found that PTSD symptoms fully mediated the association between non-interpersonal violent victimization and substance use,

and partially mediated the effects of interpersonal violent victimization and child sexual abuse (CSA) on alcohol and illicit drug use. The current study included participants with and without prior victimization, and the mean age was 14.51 at the point of the survey. From this, age – either the limited age range or young age population - may be related to the insignificant role of PTSD clusters on alcohol or illicit drug use.

A major implication of these findings is that future research must consider the important mediating role of PTSD. In GST, Agnew (1992) articulates the mediating role of negative emotions; yet, the theory has not considered PTSD and its role within the theory, especially when examining the theoretical connections between exposures to various forms of violent victimization and juvenile crime and substance use. At present, studies on general strain theory have only examined such forms of negative emotion as anger, anxiety, and frustration. This study examined PTSD as a critical risk factor for juvenile delinquency. It is clear that youth who experience violent victimization exhibit various PTSD symptoms which, in turn, increase their risk of engaging in property and violent crime.

Additionally, the findings provide an important contribution to psychology studies. Although the effect of violent victimization on PTSD and juvenile delinquency were examined, there was little known about the independent mediating roles of the three PTSD clusters. The inclusion of the three PTSD clusters individually and simultaneously allowed for comparison between risk factors. By using an overall measure of PTSD, prior studies may have over-estimated the main effect of PTSD. It is likely that some aspects of PTSD may have stronger

effects on outcome variables than others and some may exert a greater (or lesser) mediating role in the violent victimization-juvenile crime link. This study estimated how re-experiencing, avoidance/numbing and hyperarousal symptom clusters independently influence the link between three forms of violent victimization and inner- and outer-directed behaviors. The final models demonstrated that two (avoidance/numbing and hyperarousal) of the three PTSD clusters independently and partially mediate the relationships between the violent victimization variables and outer-directed behaviors; however, none of them played mediating roles in the relationships between the violent victimization variables and inner-directed response. These findings suggest that the differing PTSD clusters may differentially affect various behavioral outcomes, as well as the relationships between different exposure to violence measures and the various behavioral outcomes.

The fourth major finding was that control variables are associated with the outcome variables in different ways. The strongest predictor of inner-directed behaviors was delinquent peers. Individuals who are associated with delinquent peers were more than three times the risk of using alcohol or illicit drug than individuals without delinquent friends. However, delinquent peers did not have such significance in the relationship between violent victimization and outer-directed behaviors. This finding is not consistent with prior studies that suggest that delinquent peers have the strongest conditioning effect (Agnew & White, 1992; Bao et al., 2004; Baron, 2004; Mazerolle & Piquero, 1997; 1998; Mazerolle et al., 2000; 2003; Moon et al., 2009).

In this study, African Americans are less likely to use alcohol and drug than Whites. They also do not engage significantly in property and violent crime, compared to Whites and other people. Hispanics, however, are at higher risk, indicating that they have a higher probability of committing property and violent crime than Whites. These findings are not consistent with prior studies that suggest that African Americans are aggressive, and more engage in crimes and substance use (Agnew, 1999; Cherlin, 2009; Jang & Johnson, 2003; Simons et al., 2003). For gender, while females and males similarly engage in inner-directed response, males are at higher risk of engaging in property and violent crimes (Baron, 2004; Lin & Miecckowski, 2011; Mazerolle et al., 2000; Moon et al., 2009; Morash & Moon, 2007). For both outcome variables, stressful life events have a significant and positive effect. Consistent with prior studies, adolescents increase the strain from the failure to achieve positively valued goals (Cheung & Cheung, 2010; Mazerolle & Piquero, 1997; 1998; Morash & Moon, 2007). The strained adolescents respond to strains through using substance and engaging in crimes.

Limitations

While the current study provides valuable insights into the effects of violent victimization on PTSD and juvenile delinquency, there are several limitations that should be addressed. First, the causal relationship between violent victimization and inner- and outer-directed response has not been clarified. All variables in this study were measured by asking the respondents' experiences during their lifetime up the point of the interview. Regarding this, it is uncertain to conclude that violent victimization leads to adolescents' engaging in crime and

using substance. However, this limitation should not be a serious issue to challenge the findings. Previous longitudinal studies on general strain theory have found that strains lead to delinquent activities (Agnew & Brezina, 1997; Agnew & White, 1992; Agnew et al., 2002; Eitle, 2002; Mazerolle and Maahs, 2000; Moon et al., 2009). Furthermore, studies using the sample of detained juvenile offender also elucidate the causal relationship (Ariga et al., 2008; Becker & Kerig, 2011; Cisler et al., 2012; Haller & Chassin, 2014; Finkelhor et al., 2009; Hawke et al., 2009; Rosenberg et al., 2014; Shen, 2009).

Second, this study did not include any measures of negative emotion, as stated in GST. The NSA data includes a host of survey questions tapping PTSD symptoms that meet the *DSM-IV* criteria. Most importantly, the survey measured all three clusters of PTSD. Unfortunately, the NSA data set does not provide adequate or multiple indicators for the various forms of negative affect. Indeed, there was only one question that might be considered as a measure of anger⁶. However, anger is typically measured by asking respondents if they have easily lost their temper, get mad, felt annoyed, yelled at somebody, or threw things (Agnew & White, 1992; Agnew et al., 2002; Bao et al., 2004; Derogatis, 1977; Mazerolle & Maahs, 2000; Moon & Morash, 2004; 2013). Taking this into consideration, the question was not suitable as a measure of anger, but it did easily fit within the PTSD cluster involving hyperarousal symptoms. In terms of anxiety, prior studies have asked about feeling tense, nervous, fearful, or being panicked (Brezina, 1996; Piquero and Sealock, 2000). For depression, a number of questions were asked

⁶ The exact working of the question was “Have you ever experienced a period of two weeks or more during little things a lot or could make you very angry?”

about sleeping problems, change in appetite, crying spells, level of activity and suicide ideations (Brezina, 1996; Manasse & Ganem, 2009; Lin et al., 2011). There were few measures of anxiety and depressive symptoms. However, the measures overlapped with symptoms commonly found or attributed to one or more of the PTSD clusters. For example, sleeping problems and low activity level are commonly associated with symptoms of depression but are also regarded as indicators of avoidance and numbing. Likewise, some of the symptoms associated with hyperarousal are also commonly used as indicators to measure anxiety and depression. As a result, it is important to note that some of the indicators typically found in measures of anxiety and depression are reflective of or contained in most PTSD measures. Thus, in this study, these questions were considered as PTSD symptoms.

Third, despite the above limitation, this study attempted to control for negative affect by including depression as a control variable. Nevertheless, this study failed to completely control for negative affect by not considering other forms such as anxiety and anger specifically. The absence of measures that tap the full range of negative affect blurs the possible link between violent victimization and emotional and behavioral responses. As seen in the results, none of the PTSD symptoms mediated the effects of violent victimization on using alcohol or drugs. It is certainly unknown which emotions work as important mediators. It is possible that victimized adolescents may not only respond to exposure to violence through PTSD. Some may be more aggressive, while others may face more depressive symptoms from the same violent victimization.

Furthermore, using only PTSD measures failed to detect how negative affect and PTSD are related each other. Anger has a significant mediating role on the strain-delinquency relationship across different types of delinquency (Agnew et al., 2002; Bao et al., 2004; Broidy, 2001; Jang & Johnson, 2003; Patchin & Hinduja, 2011; Rebellon et al., 2012). However, some have suggested inconsistent results on how anger and other negative emotions mediated the association between strain and delinquency, because of the possible co-occurrence of such negative emotions (Capowich et al., 2001; Gamen, 2011; Mazerolle et al., 2003). Gamen (2011) stated that anger, depression, and frustration were found in all three scenarios and had similar effects on outcome variables. Thus, broader forms of negative affect and psychological diagnosis should be estimated.

Future Research

Future research should focus greater attention on the mediating role of PTSD. Further, it is important to consider negative emotions and PTSD together within a GST framework. It should be emphasized, however, that negative emotions and PTSD may work in different ways on the association between violent victimization and subsequent outcomes. As Reiland and colleagues (2014) found, negative emotion and PTSD may co-occur from exposure to violence. Kerig and colleagues (2012) suggested that PTSD was a mediator of the violent traumatic events on anger and depression. Another study (Kendra et al., 2012) also suggested that female young adults who had been abused in childhood experienced PTSD symptoms that increased their level of anger, which is related to engaging in violent perpetration for intimate partners. It is

also possible that negative emotion may occur before PTSD and increase the re-experiencing symptoms.

Although the current study did not find gender differences, future research can broaden the PTSD analysis focusing on the differences between males and females. While males experience PTSD symptoms from both interpersonal and non-interpersonal traumatic events, females experience PTSD symptoms from interpersonal traumatic events (Kerig et al., 2012). Moreover, males and females react differently to the same violent victimization: witnessing violence in the community is related to re-experiencing symptoms for females, whereas such violence is related to hyperarousal symptoms for males (Allwood & Bell, 2008). Similarly, males respond to violent victimization through externalizing behaviors (property or violent crime), whereas females are more likely to experience dissociative symptoms (Zona & Milan, 2011). Regarding these findings, future studies should be extended to explore more fully the role of gender on negative emotions, PTSD, and inner- and outer-directed behaviors. There are two ways in which future research should further examine the impact of sex difference on violent victimization and PTSD symptoms. The first approach is to consider different sources of violent victimization. Gender differences can result from the different risk level: females are more likely to be sexually assaulted; males are at a higher risk of being physically attacked. The second approach is to consider the differences in the level of negative emotion between females and males. They face different levels of negative emotion from violent victimization (Broidy &

Agnew, 1997; Patchin & Hinduja, 2011). By analyzing all three clusters of PTSD, it can be estimated how males and females respond differently to violent victimization.

These findings also indicate the importance not just for theory, but also for intervention. Affection and a safe social environment in childhood will significantly reduce the likelihood of juvenile crime and substance use. Of course, offenders are fully responsible for their crimes. Regarding the increased risk of victims' future perpetrations, it is important to identify individuals who are at high risk for victimization, as well as those who have mental health problems. For effective preventive programs, schools and neighborhoods need to better control delinquent adolescents within their local environments. As Baron found (2004), living on the street can increase the risk of participating in crimes, as well as being victimized. Victimized adolescents may develop antisocial and aggressive behaviors. For effective treatment programs, identifying the types of traumatic events and subsequent and varied emotional responses will be the first step. For example, studies that show gender differences in outcome behaviors would suggest the importance of adopting gender-specific treatment strategies. Likewise, the growing problem of school bullying also needs to be carefully considered (Higgins et al., 2011; Patchin & Hinduja, 2011; Moon et al., 2012). Despite the mixed findings, school bullying is one type of victimization that may increase self-destructive acts.

In conclusion, it appears that exposure to violent victimizations is an important risk factor that leads to engaging in juvenile crime and substance use. Findings in the current study

provide support for a key proposition within GST. Exposure to violent victimization increases the likelihood of engaging in outer- and inner-directed behaviors. Specifically, experiencing physical and sexual assault and witnessing violence demonstrated strong, direct, and independent effects on juvenile crime and substance use. More importantly, however, this study expanded the notion of the mediating role of negative affective states in GST to consider the role of PTSD. Drawing upon psychological studies on victimization, this study discovered that PTSD, as an overall measure and as its individual clusters, may play a crucial role in explaining the link between the exposure to violent victimization and juvenile crime. Although PTSD was not found to mediate this linkage for inner-directed responses such as substance use, it did mediate partly the effects of exposure to violence on outer-directed behaviors such as juvenile crime. More theoretical development and research within GST is needed to more fully understand and explain the link between violent victimizations and juvenile crime.

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Vita

YEOJU PARK
2198 Briarcliff Rd NE
Atlanta, GA 30329
404-775-0766
ypark23@student.gsu.edu

Yeoju Park was born on March 1, 1983, in Busan, Republic of Korea. She attended Dong-eui University, where she received her Bachelor of Law in 2006. While attending the college, Yeoju spent her first year on studying laws, including Constitution, Criminal Law and Criminal Procedure Act. In the following three years at college, she completed all her major classes in Police Science, with excellent results. Specifically, she cut a brilliant figure in Criminal Psychology and Criminal Investigation course. In Juvenile Crime class, she became interested in juvenile delinquency and social factors. The increasing juvenile crime rates caught her attention. Based on her academic performance, she was granted a scholarship from the College Law and Government from 2003 to 2006.

As a part of the program curriculum, Ms. Park had learned defensive tactics, martial arts and arrest techniques starting in 2002. She continued to train herself at a private school, and she gained two black belts in Taekwondo and Judo. Also, Yeoju took a variety of training courses. In 2004, her Custody and Correction system class brought her to the Busan Juvenile Protective Custody Office. Her interests in problems of youth delinquency and crime became deeper through a field trip to the office. She noticed that the change in family structure and function were significantly associated with juvenile delinquency. This viewpoint reinforced her

designation to study juvenile crime and community-level treatments and accelerated my desire to study further at the graduate level.

She visited and trained at the Busan Police Department and the Busan Jin-Gu Patrol Division in 2005. The training courses focused on the systematic police strategy and the community-oriented police strategy. In 2006, she attended the private security conference at the head office of S-1 (Samsung Security). In the same year, she visited The Blue House for the training of the presidential security service system.

Regarding the graduation thesis at college, Ms. Park discussed the relationship between the police department and prosecutor of South Korea. She stated problems in the police organization and articulated fundamental factors for police reform. Yeosu was a summa cum laude when she graduated from college. At graduation, she was honored with a certificate of award from the chief of police for high academic and training performance.

In the masters' program at Georgia State University, Ms. Park became enthusiastic about developing the research skills. The knowledge from Statistics and other criminal justice classes accelerated her interest in research design. Dr. Volkan Topalli, her advisor, let Yeosu experienced diverse duties as a research assistant from data entry to data collection.

Starting in fall 2015, Ms. Park is going to attend the Ph.D. program at the University of South Carolina, Columbia. She will develop a professional statistical skill from Applied Statistics class. She also plans to take Sociology as minor for further understanding of family, social factors and crime.