THE INFLUENCE OF RISK AND PROTECTIVE FACTORS ON HEALTH-COMPROMISING BEHAVIORS AMONG INCARCERATED JUVENILES

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Theresa Puckett

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THE INFLUENCE OF RISK AND PROTECTIVE FACTORS
ON HEALTH-COMPROMISING BEHAVIORS
AMONG INCARCERATED JUVENILES

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Dissertation

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ABSTRACT

Over 100,000 juveniles are held in detention facilities yearly in the United States. Incarcerated juveniles are more likely than adolescents in the community to engage in health-compromising behaviors. The overall purpose of this study was to examine how risk factors (gender, victim of sexual abuse, violent home environment and substance use in the home) increase the chance of incarcerated adolescents engaging in health-compromising behaviors (current alcohol, drug, and prescription drug abuse, risky sexual behavior, behavioral manifestations of depressive symptoms, outward display of temper and engaging in physical fights). Additionally, the study examined how protective factors (in school, positive peer influence, perceived family support, mental health, alcohol and drug treatment) mediate the relationship between risk factors and engaging in health-compromising behaviors. This study was guided by a conceptual framework synthesized from Jessor and Jessor’s (1977) problem behavior theory and from the literature.

Data were analyzed using two-step hierarchical regression analysis. Major findings include how important staying in school and having positive peer influence are as protective factors against engaging in health-compromising behaviors and how hard it is to overcome the effects of living in a violent home environment. These findings suggest that school-based interventions, peer mentoring programs and the early identification and treatment of juveniles from a violent home environment may lead to better health outcomes for at-risk youth.
DEDICATION

This dissertation is dedicated to my husband James and children James, Alyssa, Aaron and Andrew. Their sacrifice during this process was greater than mine.
ACKNOWLEDGEMENTS

Thanks to my chair Dr. Diana L. Biordi for all of her support and guidance, as well as to the committee members for their time and expertise during this process. I would like to further acknowledge Sonia Alemagno for her generosity in allowing me to conduct a secondary analysis on her database.
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CHAPTER I

INTRODUCTION

Approximately 150,000 juveniles under the age of 18 are held in detention facilities yearly in the U.S. (Puzzanchera, Sladky, & Kang, 2009). Incarcerated juveniles are more likely than adolescents living in the community to engage in health-compromising behaviors such as alcohol use (Eklund & Klinteberg, 2005), drug use (Dembo & Schmeidler, 2003; Eklund & Klinteberg, 2005), prescription drug abuse (Abram et al., 2003; Guthrie et al., 2002) and risky sexual behaviors (Chang, Bendel, Koopman, McGarvey, & Canterbury, 2003; Godin et al., 2003). For example, empirical evidence shows that almost 90% of juvenile detainees have used alcohol and 50% to 67% have a history of illegal drug abuse or prescription drug abuse (Abram et al., 2003; Guthrie et al., 2002). Prevalence rates of self-reported sexual activity among juveniles aged 10 to 18 prior to incarceration have been reported as ranging from 45% to 90% (Chang et al., 2003; Oman et al., 2002) compared to 25% for children with no history of incarceration (Wills, Gibbons, Gerrard, Murry, & Brody, 2003). Clearly, further research is needed to determine what factors contribute to engaging in health-compromising behaviors among incarcerated juveniles.

Purpose

The overall purpose of this study was to examine how certain risk factors (gender, victim of sexual abuse, violent home environment and substance use in the home) increase the risk of incarcerated adolescents engaging in health-compromising behaviors (current alcohol, drug, and
prescription drug abuse, risky sexual behavior, behavioral manifestations of depressive symptoms, outward display of temper and engaging in physical fights). Additionally, this study examined how protective factors (in school, positive peer influence, perceived family support, and mental health, alcohol and drug treatment) mediate the relationship between risk factors and engaging in health-compromising behaviors. This study was guided by a conceptual framework synthesized from Jessor and Jessor’s (1977) problem behavior theory and from the literature.

The data, which were gathered during an intake assessment of incarcerated juveniles, were part of a secondary data set made available to this researcher. The intake assessment was confined to simple questions using a yes-no response and based on factors known to affect the behavior of juveniles incarcerated throughout the United States. As a secondary data analysis, this researcher was confined to choices among the variables which lent themselves to a theoretical framework and subsequent analysis. Not all the variables of the original data set were used in this research, but rather, only those which had theoretical relevance were examined.

Conceptual Framework

Jessor and Jessor’s (1977) problem behavior theory contributed to the conceptual framework for this study because of its ability to guide the selection of risk and protective factors that may influence adolescents to engage in health-compromising behaviors. A review of the literature provided further evidence for the inclusion of specific risk and protective factors to include in the conceptual framework. Evidence for relationships among the study concepts was also supported by the literature review and is presented in Chapter II.
Problem Behavior Theory

Problem behavior theory was developed by Jessor and Jessor (1977) to explain an increase in deviant behavior in the late 1960s and early 1970s and to address the lack of adolescence research at that time. Problem behavior was originally defined as actions that are deemed undesirable by society (Jessor & Jessor, 1977). Originally, Jessor and Jessor’s (1977) theory was used to provide an explanation for problem behaviors such as alcohol consumption, marijuana use, sexual intercourse, activist protesting, and general deviance.

According to Jessor and Jessor (1977), there are three interrelated domains that influence behavior: the personality system (personality characteristics), the perceived environment system (social environmental factors), and the behavior system (behavioral conformity to societal norms). Within each domain, the balance of risk factors and protective factors determine the adolescent’s overall level of proneness to problem behavior. In problem behavior theory, risk factors are “conditions or variables that are associated with a lower likelihood of socially desirable outcomes” (Jessor, Turbin, & Costa, p. 195) such as family history of inter-/intra-personal violence and substance use (Jessor, Turbin, & Costa, 1998). Protective factors are conditions that decrease the likelihood of a negative social outcome (Jessor et al., 1998).

In addition, Jessor and Jessor (1977) postulate temporality between the three systems. According to the theory, engaging in risk behaviors within the behavioral system is a result of having common risk factors within the personality and perceived environment systems. Therefore, a risk factor in the personality or perceived environment systems may contribute to an increased risk of engaging in several problem behaviors rather than just one behavior.
In 1991, problem behavior theory was extended to consider how risk and protective factors within the three domains contribute separately and together to health-compromising behaviors (Jessor, 1991). The rationale for the extension of the theory to health-compromising behaviors is that many problem behaviors, such as unprotected sexual intercourse and alcohol use, are considered health-compromising and may result in a negative outcome such as teenage pregnancy or driving while intoxicated. In the present study, two of Jessor and Jessor’s (1977) explanatory systems were used to guide the examination of risk and protective factors that influence health-compromising behaviors in incarcerated juveniles: the perceived environment system and the behavior system. The personality system was not examined because this study was a secondary data analysis and data on the personality system were not collected during the original study from which this secondary analysis stems.

*Perceived Environment System*

Jessor and Jessor’s (1977, 1991) perceived environment system considers the degree to which an adolescent is located in a social context where problem behavior is role modeled. For example, if parents or peers engage in problem behaviors or if the adolescent perceives that parents or peers approve of disorderly conduct, the likelihood of the adolescent acting inappropriately is increased. In this study, risk factors in the perceived environment system that are consistent with Jessor and Jessor’s (1977, 1991) definition of risk factors include victim of sexual abuse, violent home environment, and substance use in the home. However, in the current study gender is also a risk factor, because there may be a difference in how males and females experience the environment. Protective factors in the perceived environment system for the current study include in school, positive peer influence, perceived family support, mental health
care utilization, alcohol treatment health care utilization and drug treatment health care utilization. Each of these factors is discussed in detail below.

*Perceived Environment System: Risk Factors*

**Gender**

Gender is considered to be a risk factor in this study and is an expansion of Jessor and Jessor’s (1977, 1991) conceptualization of a risk factor in the perceived environment system. There are differences in the socialization and life experiences of boys and girls because of gender (Daigle, Cullen, & Wright, 2007; Zucker, 2008). These differences may affect the degree to which risk factors influence engaging in health-compromising behaviors for one gender versus the other. For example, because girls are encouraged to develop close personal relationships while boys are encouraged to be independent, girls may be more affected by family conflict than boys (Chavez, 2002; Hoyt & Scherer, 1998; Kim, 2005; Werner & Silbereisen, 2003; Zucker, 2008).

**Victim of Sexual Abuse**

Victim of sexual abuse in this study is consistent with Jessor and Jessor’s (1977, 1991) conceptualization of a risk factor in the perceived environment system. Victim of sexual abuse is relevant to this study because empirical evidence suggests that when an adolescent has been sexually abused, he or she is more likely to engage in health-compromising behavior. For example, history of sexual abuse was a predictor of violent behavior, substance use, risky sexual behavior, and suicidal gestures in a sample of 163 female high school students (Holsinger & Holsinger, 2005). Sexually abused males also have an increased risk of engaging in violent behavior (Preski & Shelton, 2001).
Violent Home Environment

Violent home environment in this study is consistent with Jessor and Jessor’s (1977, 1991) conceptualization of a risk factor in the perceived environment system. Violence within the family of origin has been associated with negative health outcomes for adolescents such as alcohol use (Hawkins & Catalano, 1992), substance use (Preski & Shelton, 2001; Smith, Ireland, & Thornberry, 2005; Werner & Silbereisen, 2003), depression (Herrenkohl, Kosterman, Hawkins, & Mason, 2009; Holt, Buckley, & Whelan, 2008; Powers, Ressler, & Bradley, 2009; Skybo, 2005; Smith et al., 2005), and violent behavior (Aslund et al., 2009; Haapasalo, 2000; Preski & Shelton, 2001; Smith et al., 2005). Violence experienced in the home during early childhood causes children to have distorted perceptions of the actions of others, which can lead to normalization of health-compromising behaviors such as substance use and exhibiting aggression (Aslund et al., 2009; Baer & Maschi, 2003).

Substance Use in the Home

Substance use in the home in this study is consistent with Jessor and Jessor’s (1977, 1991) conceptualization of a risk factor in the perceived environment system. When parents model substance use in the home, there is an increased likelihood that the child will also become a user (Clark & Cornelius, 2004; Cleveland, Feinberg, Bontempo, & Greenberg, 2008; Ozer & Fernald, 2008; Schinke, Fang, & Cole, 2008). For example, there is a two- to four-fold increase in the likelihood that a boy will become an alcoholic if he has an alcoholic parent (Hawkins & Catalano, 1992). In an ethnographic study of 20 male juvenile delinquents, interview responses indicated that adolescents used substances because it was considered a normal part of the family’s lifestyle (Anderson, 1999).
Perceived Environment System: Protective Factors

In School

In school in this study is consistent with Jessor and Jessor’s (1977, 1991) conceptualization of a protective factor in the perceived environment system. Staying in school is a reflection of an adolescent’s emotional intelligence, social competence and involvement, and general organizational skills (Zucker, 2008). Empirical evidence provides support for school attendance as a protective factor against substance use (Coley, Votruba-Drzal, & Schindler, 2008; Kliewer & Murrelle, 2007), violent behavior (Hart, O'Toole, Price-Sharps, & Shaffer, 2007; Sprott, Jenkins, & Doob, 2005), and risky sexual behavior (Fisher, Eke, Cance, Hawkins, & Lam, 2008; Kogan et al., 2008; Laflin, Wang, & Barry, 2008; Lohman & Billings, 2008; Tevendale, Lightfoot, & Slocum, 2009). In a sample of 2,328 adolescents, regular school attendance was the strongest predictor of responsible sexual activity such as consistent condom use (Magnani et al., 2002).

Positive Peer Influence

Positive peer influence in this study is consistent with Jessor and Jessor’s (1977, 1991) conceptualization of a protective factor in the perceived environment system. Peers strongly influence adolescent behavior (Urberg, Luo, Pilgrim, & Degirmencioglu, 2003). For example, one of the most constant predictors of substance use in adolescents is having a peer who uses drugs (Branstrom, Sjostrom, & Andreasson, 2008; Cleveland et al., 2008; Hawkins & Catalano, 1992; Schinke et al., 2008). Conversely, having friends who do not drink or use drugs may decrease the chance adolescents will engage in these behaviors (Sullivan, 2006; Zucker, 2008).

Perceived Family Support
Perceived family support in this study is consistent with Jessor and Jessor’s (1977, 1991) conceptualization of a protective factor in the perceived environment system. Experiences within the family strongly influence adolescent behavior (Zucker, 2008). Self-report data from 248 adolescent girls indicates that a sense of closeness to parents decreases the risk of substance use (Werner & Silbereisen, 2003). There is also evidence of perceived family support as a protective factor against depression (Muris, Schmidt, Lambrichs, & Meesters, 2001) and risky sexual behavior (Kogan et al., 2008; Laflin et al., 2008; Lohman & Billings, 2008) in adolescents.

Mental Health Care Utilization, Alcohol Treatment Health Care Utilization and Drug Health Care Utilization

Mental health care utilization, alcohol treatment health care utilization and drug treatment health care utilization in this study are consistent with Jessor and Jessor’s (1977, 1991) conceptualization of protective factors in the perceived environment system. Health care utilization has the potential to deter or minimize adolescents’ engagement in unhealthy behaviors. For example, in a sample of 196 male adolescents, those who did not receive mental health care treatment most likely came from a home where parents used substances. In addition, boys who did not receive treatment were more likely to develop mentally ill than their counterparts who did receive treatment (Cornelius, Pringle, Jernigan, Kirisci, & Clark, 2001).

Behavioral System

Jessor and Jessor (1991) conceptualize the behavior system to include behaviors that are health-compromising. Their theory has been used in several cross-sectional and longitudinal studies to investigate health-compromising behaviors in adolescents such as alcohol use, substance use, and risky sexual behavior (Costa, Jessor, Donovan, & Fortenberry, 1995;
Behavior System: Health-Compromising Behaviors

Current Alcohol Use

Current alcohol use is consistent with Jessor and Jessor’s (1991) conceptualization of a health-compromising behavior. Youth alcohol consumption is associated with an increased risk of dropping out of school, having depression, experiencing suicidal ideation and engaging in violent behavior (American Medical Association, 2008). Self-report of alcohol use and environmental factors by 2,098 high school students found that family and friend use of alcohol were the strongest predictors of alcohol use among the study participants (Kemppainen, Tossavainen, Vartiainen, Jokela, Puska, Pantelejev, & Uhanov, 2008). According to the American Medical Association’s report on the consequences of alcohol use on the brain (2008), adolescents are more affected by alcohol use than adults. Alcohol disrupts the release of key hormones needed for brain growth and development during adolescence. As a result, even short-term and light adolescent drinkers are likely to suffer memory loss and an impaired ability to learn.

Current Drug Use
Current drug use is consistent with Jessor and Jessor’s (1991) conceptualization of a health-compromising behavior. “Current drug use” in this study refers to using these drugs: marijuana, powder or crack cocaine, LSD, inhalants, uppers or downers, heroin or any other substance for the explicit goal of getting high. Many factors contribute to how physically harmful a substance is such as type of drug used, route of administration and past history of use (Silberg, Rutter, D’Onofrio, & Eaves, 2003). Cognitive immaturity, lack of experience with decision making and a lack of ability to recognize cause and effect contributes to bad choices regarding drug use in adolescents (Brezina, 2000). Permanent brain damage, severe physical trauma and death are associated with adolescent drug use (Helstrom, Bryan, Hutchison, Riggs, & Blechman, 2004).

Moss, Lynch and Hardie (2003) conducted a longitudinal study with data collection points at age 10, 12, and 15 with a sample of 539 boys and girls using scores from the child behavior checklist. The authors concluded that children of substance using parents and peers have an increased risk of using drugs. Negative peer influence was particularly predictive of substance use in the boys whereas parental use was a stronger predictor of use for the girls.

Current Prescription Drug Abuse

Prescription drug abuse is consistent with Jessor and Jessor’s (1991) conceptualization of a health-compromising behavior. Author Greg Critser has dubbed the current generation of adolescents “Generation Rx” because for the first time in US history, adolescents are more likely to use prescription drugs to get high than any illegal street drug (Critser, 2005). It is estimated that one in five US adolescents have used a prescription medication to get high (Herman-Stahl, Krebs, Kroutil, & Heller, 2006). Prescription drug abuse is associated with male gender, poor
school attendance, alcohol use and substance using peers (McCabe, Boyd, & Teter, 2005). Therefore, empirical evidence suggests that females are less likely to abuse prescription drugs.

**Risky Sexual Behavior**

Risky sexual behavior is consistent with Jessor and Jessor’s (1991) conceptualization of a health-compromising behavior. Pregnancy, sexually transmitted diseases, emotional pain and confusion can result from adolescent sexual behavior (Pallitto & Murillo, 2008). Family and peer acceptance of adolescent sexual behaviors and role modeling of sexual behaviors was related to increased risky sexual behavior in a sample of 1,330 high school students, especially for the girls (Costa et al., 1995).

**Behavioral Manifestations of Depressive Symptoms**

Behavioral manifestations of depressive symptoms is consistent with Jessor and Jessor’s (1991) conceptualization of a health-compromising behavior. Being female and parental substance use were risk factors for developing depression in a sample of 116 incarcerated adolescent girls (Haavet, Straand, Hjortdahl, & Saugstad, 2005). Depressed adolescents are likely to use behaviors such as poor school performance, deliberate self-harm, and suicidal attempts to communicate depression (Grisso, 2004).

**Outward Display of Temper and Engaging in Physical Fights**

Outward display of temper and engaging in physical fights are consistent with Jessor and Jessor’s (1991) conceptualization of health-compromising behaviors. Adolescent behavior characterized by society as violent may be a result of family history (Gover & MacKenzie, 2003). Violence experienced in the home during early childhood causes children to have distorted perceptions of the actions of others, which can lead to an inappropriately aggressive
response to other people and a normalizing of hostile behavior (Baer & Maschi, 2003).

Examination of self-report data with logistic regression in a sample of 808 male and female high school students found that risk factors for violent behavior included male gender, parental violence and violent peers (Herrenkohl et al., 2000). Figure 1 illustrates the conceptual framework of the study and Table 1 lists the study concepts, operational definitions and empirical indicators.

Figure 1.1. Conceptual Model for Predicting Health-Compromising Behaviors Among Incarcerated Juveniles
### Table 1. Study Concepts, Operational Definitions and Empirical Indicators

**Perceived Environment System: Risk Factors**

<table>
<thead>
<tr>
<th>Concept</th>
<th>Operational Definition (s)</th>
<th>Empirical Indicator (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male or female</td>
<td>Q.1 Are you male</td>
</tr>
<tr>
<td>Victim of sexual abuse</td>
<td>Unwanted sexual touch/activity</td>
<td>Q.79 Has anyone ever touched you or done anything to you in a sexual way that you did not want to have done</td>
</tr>
<tr>
<td>Violent home environment</td>
<td>Threatening arguments or physical fights in the home resulting in harm; running away due to fear of going home</td>
<td>Q.83 Have you had arguments at home where you threaten to hurt each other &lt;br&gt; Q.84 Have you had physical fights in your home where you hurt each other &lt;br&gt; Q.86 Have you ever stayed away from home for more than two nights because you didn’t want your family to know something or you were afraid to go home</td>
</tr>
<tr>
<td>Substance use in the home</td>
<td>Being embarrassed or upset due to substance use occurring in the home</td>
<td>Q.85 Does anyone in your home drink or use drugs enough to embarrass or upset you</td>
</tr>
</tbody>
</table>

**Perceived Environment System: Protective Factors**

<table>
<thead>
<tr>
<th>Concept</th>
<th>Operational Definition (s)</th>
<th>Empirical Indicator (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>In school</td>
<td>Currently attending school</td>
<td>Q.81 Right now, are you out of school because you dropped out, or were you expelled or suspended (Reverse coded)</td>
</tr>
<tr>
<td>Positive peer influence</td>
<td>Peers who do not skip school to use alcohol or substances; Peers who do not use alcohol or substances to an excess</td>
<td>Q.68 Have you ever skipped classes or missed a whole day of school to drink or get high with friends &lt;br&gt; Q.70 Does your best friend drink or get high a lot (Reverse coded)</td>
</tr>
<tr>
<td>Perceived family support</td>
<td>Family is there to help, is dependable, and contributes to the development of optimal personal development</td>
<td>Q.97 When something goes wrong, is your family there to help you &lt;br&gt; Q.98 Can you depend on your family &lt;br&gt; Q.99 Does your family help you to be the person you want to be</td>
</tr>
<tr>
<td>Mental health care utilization</td>
<td>Received outpatient or inpatient treatment due to school, family, personal, mental health or emotional problems</td>
<td>Q.10 Have you ever been seen by a counselor or psychologist because of school, family, or personal problems &lt;br&gt; Q.11 Have you ever been in the hospital for a mental health or emotional problem</td>
</tr>
<tr>
<td>Alcohol treatment health care utilization</td>
<td>Received treatment for alcohol use</td>
<td>Q.39 Have you ever gone to treatment, a counselor or a doctor because of your use of alcohol</td>
</tr>
<tr>
<td>Drug treatment health care utilization</td>
<td>Received treatment for drug use</td>
<td>Q.73 Have you ever gone to treatment, a counselor or a doctor because of your use of drugs</td>
</tr>
<tr>
<td>Concept</td>
<td>Operational Definition(s)</td>
<td>Empirical Indicator(s)</td>
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<td>-----------------</td>
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<td>----------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Current alcohol use</td>
<td>Engaged in frequent and excessive alcohol use</td>
<td>Q.30 Do you drink more than one drink of alcohol just about every day</td>
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<td></td>
<td>Q.31 When you drink, do you drink 4 or more drinks during that day</td>
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<td>Q.32 Has drinking ever kept you from doing things you were supposed to do such as going to school or work, or doing your homework</td>
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<td>Q.33 Is it ever hard to stop drinking once you have started</td>
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<td>Q.34 Have you ever wanted to keep drinking after your friends have had enough</td>
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<td>Q.35 Do you ever drink secretly or when you are alone</td>
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<td>Q.36 Have you ever gotten into a fight when you were drinking</td>
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<td>Q.37 Do people nag you or complain about your drinking</td>
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<tr>
<td>Current drug use</td>
<td>Engaged in use of marijuana, powder/crack cocaine, LSD, inhalants, uppers/downers, heroin or other substance within the past month</td>
<td>Q.41 Did you use marijuana in the past month</td>
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<td>Q.44 Did you use powder or crack cocaine in the past month</td>
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<td>Q.47 Did you use LSD in the past month</td>
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<td>Q.50 Did you use inhalants in the past month</td>
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<td>Q.53 Did you use uppers in the past month</td>
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<td>Q.56 Did you use downers in the past month</td>
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<td>Q.59 Did you use heroin in the past month</td>
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<td></td>
<td>Q.65 Did you use something else in the past month</td>
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<tr>
<td>Current prescription drug abuse</td>
<td>Engaged in prescription drug abuse within the past month</td>
<td>Q.62 Did you use prescription drugs to get high in the past month</td>
</tr>
<tr>
<td>Risky sexual behavior</td>
<td>Sex before the age of 13, unprotected sex and history of a sexually transmitted disease within the past 6 months</td>
<td>Q.75 Were you 13 years old or younger the first time you had sex</td>
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<td>Q.76 Have you had unprotected sex, that is sex where you and your partner did not use a condom or rubber</td>
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<td>Q.96 In the past 6 months have you had any VDs or STDs like herpes, syphilis, the clap, Chlamydia, trick or NGU</td>
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<tr>
<td>Behavioral manifestations of depressive symptoms</td>
<td>Presence of depressive symptoms including loss of interest in activities, feeling sad, tired, hopeless or worthless and difficulty with concentration; suicidal ideation and history of suicide attempts</td>
<td>Q.14 Have you lost interest in things that you usually do at home, at school or with your friends</td>
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<td></td>
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<td>Q.15 Do you feel sad or tired most of the time</td>
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<td>Q.16 Do you feel like your life is a mess and will never get better</td>
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<td>Q.17 Is it hard to concentrate at school or work</td>
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<td>Q.18 Do you feel like you are unimportant or worthless</td>
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<td>Q.20 Have you ever thought about killing yourself</td>
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<td>Q.21 Have you ever tried to kill yourself</td>
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<tr>
<td>Outward display of temper</td>
<td>Hard to control temper</td>
<td>Q.27 Do you have a bad temper that you can’t control sometimes</td>
</tr>
<tr>
<td>Engaging in violence</td>
<td>Engaging in physical fights at home or school</td>
<td>Q.28 Do you get into physical fights at school or home that you regret later</td>
</tr>
</tbody>
</table>
Research Question and Hypotheses

This study contains four research questions and seven hypotheses. A research question poses a problem that may be empirically examined (Knapp, 1998). A hypothesis is a statement that describes the relationship between two or more measurable variables (Kerlinger & Lee, 2000; Reynolds, 1971). Research questions are broad based statements that provide focus for the overall study, give the reader a sense of the direction of the study and leads to the development of the hypotheses. In this study, each research question addresses one step in the mediation testing process. Hypotheses are specific, testable, statements about the nature and direction of the relationship between two variables and follow from the research questions. The hypotheses in this study are directional and predict the results of the mediation testing. The research questions and hypotheses for this study are listed below.

Research Questions

1. What is the relationship between risk factors (gender, victim of sexual abuse, violent home environment and substance use in the home) and engaging in health-compromising behaviors (current alcohol, drug and prescription drug abuse, risky sexual behavior, behavioral manifestations of depressive symptoms, outward display of temper and engaging in physical fights)?

2. What is the relationship between risk factors (gender, victim of sexual abuse, violent home environment and substance use in the home) and protective factors (in school, positive peer influence, perceived family support, and mental health, alcohol and drug treatment)?
3. Do protective factors (in school, positive peer influence, perceived family support, and mental health, alcohol and drug treatment) influence engaging in health-compromising behaviors (current alcohol, drug and prescription drug abuse, risky sexual behavior, behavioral manifestations of depressive symptoms, outward display of temper and engaging in physical fights)?

4. Do protective factors (in school, positive peer influence, perceived family support, mental health, alcohol and drug treatment) mediate the relationship between risk factors (gender, victim of sexual abuse, violent home environment and substance use in the home) and engaging in health-compromising behaviors (current alcohol, drug and prescription drug abuse, risky sexual behavior, behavioral manifestations of depressive symptoms, outward display of temper and engaging in physical fights)?

Hypotheses

1. Protective factors (in school, positive peer influence, perceived family support, and mental health care utilization, alcohol treatment health care utilization and drug treatment health care utilization) will partially mediate the relationship between risk factors (gender, victim of sexual abuse, violent home environment and substance use) and engaging in the health-compromising behavior of current alcohol use among incarcerated juveniles.

2. Protective factors (in school, positive peer influence, perceived family, and mental health care utilization, alcohol treatment health care utilization and drug treatment health care utilization) will partially mediate the relationship between risk factors (gender, victim of sexual abuse, violent home environment and substance use)
and engaging in the health-compromising behavior of current drug use among incarcerated juveniles.

3. Protective factors (in school, positive peer influence, perceived family support, and mental health care utilization, alcohol treatment health care utilization and drug treatment health care utilization) will partially mediate the relationship between risk factors (gender, victim of sexual abuse, violent home environment and substance use) and engaging in the health-compromising behavior of current prescription drug abuse among incarcerated juveniles.

4. Protective factors (in school, positive peer influence, perceived family support, and mental health care utilization, alcohol treatment health care utilization and drug treatment health care utilization) will partially mediate the relationship between risk factors (gender, victim of sexual abuse, violent home environment and substance use) and engaging in the health-compromising behavior of risky sexual behavior among incarcerated juveniles.

5. Protective factors (in school, positive peer influence, perceived family support, and mental health care utilization, alcohol treatment health care utilization and drug treatment health care utilization) will partially mediate the relationship between risk factors (gender, victim of sexual abuse, violent home environment and substance use) and engaging in the health-compromising behavior of behavioral manifestation of depressive symptoms among incarcerated juveniles.

6. Protective factors (in school, positive peer influence, perceived family support, and mental health care utilization, alcohol treatment health care utilization and drug
treatment health care utilization) will partially mediate the relationship between risk factors (gender, victim of sexual abuse, violent home environment and substance use) and engaging in the health-compromising behavior of outward display of temper among incarcerated juveniles.

7. Protective factors (in school, positive peer influence, perceived family support, and mental health care utilization, alcohol treatment health care utilization and drug treatment health care utilization) will partially mediate the relationship between risk factors (gender, victim of sexual abuse, violent home environment and substance use) and engaging in the health-compromising behavior of engaging in physical fights among incarcerated juveniles.

Significance to Nursing

The findings of this study will provide valuable information for nurses practicing in juvenile detention facilities, psychiatric hospitals, schools, and outpatient clinics to use when planning interventions for adolescents and their families. Identifying risk and protective factors that contribute to health-compromising behavior among adolescents will lead to the development of evidence-based risk assessment instruments and has important clinical implications such as predicting future health behavior (Firth et al., 2009; Kaminer, Connor, & Curry, 2007). For example, if a patient has risk factors for engaging in health-compromising behavior, the nurse can intervene by implementing interventions that increase protective factors. In turn, these interventions will decrease the chance that the patient will engage in health-compromising behavior. The importance of
connecting adolescents to appropriate health care services in order to optimize physical and mental health outcomes is also highlighted by this study.
CHAPTER II

REVIEW OF LITERATURE

This study examined how risk factors (gender, victim of sexual abuse, violent home environment and substance use in the home) increase the chance of incarcerated adolescents engaging in health-compromising behaviors (current alcohol, drug, and prescription drug abuse, risky sexual behavior, behavioral manifestations of depressive symptoms, outward display of temper and engaging in physical fights). Additionally, the study examined how protective factors (in school, positive peer influence, perceived family support, and mental health, alcohol and drug treatment) mediate the relationship between risk factors and engaging in health-compromising behaviors. Theories and empirical literature related to the study are reviewed in this chapter. A review of the literature serves to examine, critique, and synthesize existing literature within a domain in order to identify strengths, deficiencies, conflicts, and gaps (Torraco, 2005). The literature review provided support for the hypothesized relationships between the study concepts.

Problem Behavior Theory

Problem behavior theory is a conceptual framework derived from Merton’s concept of anomie (Jessor & Jessor, 1977; Merton, 1938) and Burgess and Akers’ social learning theory (Burgess & Akers, 1966). The concept of anomie refers to the inconsistency between societal expectations and individual behavior (Shoemaker, 1996). 

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Based on the theory of anomie, social learning theory has been used to examine behaviors of adolescents within a social environment context. The concept of role modeling is central to the theory, which postulates that adolescents are especially vulnerable to familial and environmental role models such as parents, peers, and the media (Williams-Evans & Myers, 2004).

The idea that adolescents engage in behaviors that are not socially acceptable and that they may do so because they are role-modeling the behaviors of parents and peers is the foundation of Jessor and Jessor’s (1977) problem behavior theory. The theory was originally developed to guide the Tri-Ethnic Research Project, a study of alcohol use and other socially deviant behaviors among adolescents in a small rural community in Colorado (Jessor, Graves, Hanson, & Jessor, 1968). The conceptual structure, empirical support, and relationship of Jessor and Jessor’s (1977, 1991) problem behavior theory to the current study are discussed in the following sections.

**Conceptual Structure**

Building on a foundation in the social sciences, Jessor and Jessor’s (1977) problem behavior theory provides a framework for examining unacceptable social behaviors exhibited by adolescents such as alcohol and marijuana use, sexual intercourse, and general deviance. Jessor and Jessor (1977) named these behaviors “risk behaviors”. Behaviors are considered risky when the timing or extent of the behavior is abnormal. For example, driving is a risk behavior for a 12 year old but is normative for a 16 year old (Jessor & Jessor, 1977). Jessor and Jessor (1977) state that involvement in one risk behavior increases likelihood of involvement in other risk behaviors since behaviors
often share similar psychological, environmental, and/or biological antecedents. These antecedents are conceptualized as risk factors present in the person’s personality and/or environment.

The fundamental premise of Jessor and Jessor’s (1977) problem behavior theory is that all behavior is the result of the interaction between the person and the environment. The theory has three major systems of explanatory variables: the personality system, the perceived-environment system, and the behavior system. Each system is composed of concepts that are either risk factors for engaging in problem behavior or protective factors against involvement in problem behavior. It is the balance between risk factors and protective factors that determines the degree of proneness for problem behavior within each system (Jessor & Jessor, 1977).

In 1991, problem behavior theory was extended to consider how risk and protective factors within the three domains contribute separately and together to health-compromising behaviors (Jessor, 1991). Many of the problem behaviors first identified by Jessor and Jessor (1977) are considered health-compromising such as alcohol and marijuana use and engaging in unprotected sexual intercourse. Furthermore, adolescents who observe others role-modeling health-compromising behaviors in their home or school environment may be at increased risk of also engaging in the behaviors since use may connote acceptance. The remainder of this section will discuss the explanatory systems of the theory.
Personality System

The personality system examines the inconsistency between societal norms and an individual’s values, expectations, attitudes, beliefs, and orientation towards self and others (Jessor & Jessor, 1977). In other words, this system examines how prone a person is to problem behaviors based on the inherent cognitive characteristics of the person. The personality system contains three structures: the motivational-instigation structure, the personal belief structure and the personal control structure.

The motivational-instigation structure is concerned with the directional orientation of behaviors. Engaging in a behavior is the result of identifying a need for the behavior and having the motivation and resources for completing the action. For example, in order to use an illegal drug, a person has to be motivated to use the drug and have accessibility to the drug, money, and the physical ability to consume the drug. This structure examines the behavioral goals a person sets and the motivation the person has for achieving those goals.

The personal belief structure is concerned with the cognitive controls that are exerted against engaging in a problem behavior. These controls include social criticism, alienation, self-esteem, and internal-external locus of control. For example, an adolescent may be hesitant to engage in sexual activity because of fear of criticism by church members. In order to be affected by cognitive controls, the person has to be able to foresee the consequences of a behavior.

The personal control structure is similar to the personal belief structure in that it is concerned with the controls against problem behavior. However, Jessor and Jessor (1977)
make a distinction between the two structures by explaining that the personal belief structure contains concepts that are more distal to the behavior than the personal control structure. The three concepts in the personal control structure are tolerance of deviance, religiosity, and the discrepancy between the reasons for and against engaging in the problem behavior. For example, an adolescent may refrain from engaging in a physical fight with a peer because of religious beliefs against violence. The personality system was not examined in this study because it was not measured in the study from which this secondary analysis stems. Therefore, data on the personality system from the study sample were not available to be included in this study.

Perceived Environmental System

Jessor and Jessor (1977) incorporated the main theoretical concept of social learning theory (Burgess & Akers, 1966), role modeling, in their conceptualization of the perceived environment system. Concepts within the system are classified according to the directness of their relationship with risk behaviors. The perceived environment system has two structures: the distal structure and the proximal structure.

The distal structure is concerned with the balance between perceived support and perceived control for engaging in problem behaviors. The concepts in this structure include family support, family control, peer support, and peer control of problem behavior. Family-peers compatibility, that is the agreement between family and peer attitudes toward problem behavior, is also considered in the distal structure.

The proximal structure is concerned with parental and peer role modeling of problem behavior. Jessor and Jessor (1977) believe that the presence of role models is a
critical aspect of the social environment and is directly related to how and what is learned by adolescents. Therefore, if an adolescent observes role models for problem behaviors, than the adolescent is more likely to also engage in the behaviors.

The current study considers risk and protective factors that are consistent with Jessor and Jessor’s (1977, 1991) conceptualization of the perceived environment system. The current study examines the risk factors of violent home environment and substance use in the home and the protective factors of family support and positive peer influence. Additional risk and protective factors, such as gender, victim of sexual abuse, in school, and mental, alcohol, and drug health care utilization were included in the current study as a result of a review of the literature on adolescent risk behavior. Support for the inclusion of these factors is provided later in this chapter.

Behavioral System

The behavior system is concerned with actions, both positive and negative, that are executed by adolescents. According to Jessor and Jessor (1977, 1991), behavior is the result of the interaction between the person and the environment. Therefore, behavior can be seen as an outcome of having risk factors within the personality and perceived environment systems. The behavior system includes two structures: the problem-behavior structure and the conventional behavior structure.

The problem-behavior structure was first concerned with actions that are considered to be inappropriate by larger society, but was later extended to examine health-compromising behaviors. Since the theory was developed during the 1960s and 1970s, it makes sense that the original concepts in this structure were political activism,
drug use, and sexual behavior because of what was going on in the US during those years. In 1991, when the theory was extended to allow for the consideration of problem behaviors as “health-compromising behaviors”, it allowed for the examination of concepts other than those originally identified by Jessor and Jessor (1977) such as self-harm and violent behavior (Jessor, 1991).

The conventional behavior structure is concerned with behavior that is socially acceptable. The two concepts in this structure are church involvement and school performance as measured by grade point average. School and church can be seen as institutions that foster socialization and an interest in the larger community. Jessor and Jessor (1977) believe that conventional behaviors are desirable.

In the current study, the construct of health-compromising behaviors is consistent with Jessor and Jessor’s (1977, 1991) conceptualization of the behavior system. Alcohol use, drug use, prescription drug abuse, risky sexual behaviors, behavioral manifestations of depressive symptoms, outward display of temper and engaging in physical fights threaten a person’s well-being and can be considered socially unacceptable as well as health-compromising. Health-compromising behaviors in the current study are postulated to be an outcome of the balance between risk and protective factors of the perceived environment system.

Empirical Support for Problem Behavior Theory

The application of problem behavior theory to examine health-behavior has been supported by empirical research. The relationship between the perceived environment system and the behavior system has been validated by studying samples of adolescents
exhibiting health-compromising behaviors. The studies reviewed in the following sections lend credibility to the relationships hypothesized in the current study.

Gender Differences

There may be gender differences in how the perceived environment system is related to the behavior system. Jessor et al. (1995) demonstrated that concepts within the perceived environment system, such as family structure and support, acted as risk or protective factors that predicted the health-compromising behaviors of alcohol use, marijuana use, sexual intercourse, depression, and fights at school in 4,426 high school students in a longitudinal study using cross-sectional hierarchical multiple regression analysis. Family support was a stronger predictor of health-behavior for females than males, indicating that family factors may be more influential on behavior for females than for males (Jessor et al., 1995).

DeCourville (1995) also examined gender differences in a sample of 760 adolescents by performing separate multivariate analyses and found that females were more susceptible than males to using alcohol and substances if other people in their environment were users (DeCourville, 1995). Similarly, Donovan et al. (1988) used Pearson correlations to examine the relationship between home and school environment and alcohol use, marijuana use, and history of sexual intercourse in a sample of 1,588 male and female high school students and found that females were more influenced to engage in behaviors that were modeled in their environment. These studies highlight the importance of considering the influence of gender on health-compromising behavior and lend support for the inclusion of gender as a risk factor.
Risk Factors and Health-Compromising Behavior

Family influences can be risk factors for health-compromising behavior. For example, Costa et al. (1995) used Jessor and Jessor’s (1977) problem behavior theory to examine family approval of risk behaviors. The authors found support for a positive relationship between family approval for sexual activity and self-reported history of sexual intercourse in a sample of 2,410 male and female adolescents using the Cox proportional hazards regression method. The relationship was stronger for the females than for the males in the sample (Costa et al., 1995).

Zhang et al. (2002) conducted a secondary analysis guided by Jessor and Jessor’s (1977) theory and used structural equation modeling to examine the relationship between the perceived environment and psychopathology in 625 adolescent males. The authors concluded that having mental health symptoms, as measured by the Psychopathic States Inventory, was related to environmental influences such as family structure and function (Zhang et al., 2002).

Protective Factors and Health-Compromising Behavior

Staying in school has been identified as a protective factor against engaging in health-compromising behaviors and is included as a protective factor in the current study. Mitchell and O’Neill (1998) used Jessor and Jessor’s (1977) problem behavior theory to examine the relationship between school attendance and alcohol use, drug use, risky sexual behavior, anxiety, depression, and violent behavior in a sample of 2,804 male and female high school students. School attendance was found to be a protective factor.
against engaging in the behaviors for both males and females. Gender differences were not examined.

Farrell, Danish, and Howard (1992) also used problem behavior theory to guide their research on self-reported alcohol use, marijuana use, and history of sexual intercourse in a sample of 2,237 adolescents. Measures of these behaviors were strongly related to each other and were inversely related to participation in conventional activities such as church and school attendance (Farrell, Danish, & Howard, 1992). Gender differences were not examined.

Based on the results of the studies mentioned above, the relationships hypothesized in the current study between risk factors of health-compromising behaviors, protective factors, and health-compromising behaviors seem feasible. The conceptual framework presented in this study is based on Jessor and Jessor’s (1977, 1991) problem behavior theory and a review of the literature. A review of Hawkins and Catalano’s (1992) book, Communities that Care, also lent support for the relationships in the current study.

Communities that Care (Hawkins & Catalano, 1992) outlines a community-based approach to adolescent substance use prevention. According to Hawkins and Catalano (1992), the key to preventing adolescent substance use is minimizing risk factors while maximizing protective factors. The family environment is recognized as instrumental in determining whether an adolescent will use substances. Substance use in the home is identified as the prominent risk factor for substance use among adolescents. Conversely, perceived family support is considered a key protective factor against adolescent
substance use. Association with drug-using peers and poor school attendance are also considered substance use risk factors by Hawkins and Catalano (1992).

Several studies have been conducted based on the work of Hawkins and Catalano (1992). Arthur, Hawkins, Pollard, Catalano, and Baglioni (2002) found that family and peer approval of substance use were risk factors for adolescent substance use in a sample of 1,097 high school students using a 350 item survey. Gender differences were not examined. Likewise, Beyers, Toumbourou, Catalano, Arthur, and Hawkins (2004) found that family and peer approval of alcohol use was related to adolescent alcohol use in a sample of 32,403 high school students using the Communities that Care Youth Survey. There were no gender differences.

The selection of risk and protective factors related to violent behavior in the current study has also been guided by Hawkins and Catalano’s (1992) framework. Peer attitude towards problem behaviors and family support predicted engagement in alcohol use, substance use, and violent behaviors in a sample of 2,203 middle school students. Family support was not different across gender (Choi, Harachi, Gillmore, & Catalano, 2005). Herrenkohl et al. (2000) found that male gender, parental violence, and violent peers were risk factors for violent behavior in a sample of 808 male and female high school students using logistic regression and a self-report survey.

Empirical research based on Jessor and Jessor’s (1977, 1991) problem behavior theory and Hawkins and Catalano’s (1992) Communities that Care work support the selection of risk and protective factors in the current study and the hypothesized relationships between factors in the perceived environment and health-behavior.
However, there are gaps in the literature. For example, there is a dearth of research on risk and protective factors of health-compromising behaviors using samples of incarcerated juveniles. Most of the research uses samples of high school students in the community. Secondly, few of the studies examine the timing or the actual level of involvement in each problem behavior. For example, a question such as “Do you drink alcohol?” does not provide insight into how long the person has been drinking or how much the person consumes at a time. Finally, gender differences in health-compromising behaviors have to be further examined.

The current study addresses these gaps in the literature by using a sample of incarcerated juveniles to examine the relationships between risk factors (gender, victim of sexual abuse, violent home environment, and substance use in the home), protective factors (in school, positive peer influence, perceived family support, and mental health care utilization, alcohol treatment health care utilization, and drug treatment health care utilization), and health-compromising behaviors (alcohol use, drug use, prescription drug use, risky sexual behavior, outward display of temper, and engaging in physical fights). Protective factors are hypothesized to mediate the relationship between risk factors and health-compromising behaviors. A conceptual framework synthesized from Jessor and Jessor’s (1977, 1991) problem behavior theory and a review of the literature guided the study. The remainder of this chapter consists of the review of empirical literature that provided support for the relationships in this study.
Review of Empirical Literature to Provide Support for Study Relationships

Theory-guided research allows for more accurate measurement, analysis, interpretation, and generalization of concepts of interest (Reifsnider et al., 2005). A conceptual framework for studying the relationships between risk factors (gender, victim of sexual abuse, violent home environment, and substance use in the home), protective factors (in school, positive peer influence, perceived family support, and mental health care utilization, alcohol treatment health care utilization, and drug treatment health care utilization), and health-compromising behaviors (alcohol use, drug use, prescription drug use, risky sexual behavior, outward display of temper, and engaging in physical fights) is needed because the relationship between environmental factors and health behavior among adolescents is of concern to nurses. The conceptual framework derived from Jessor and Jessor’s (1977, 1991) problem behavior theory and a review of the literature guided the selection of study variables. The remainder of this review focuses on presenting, critiquing, and identifying gaps in the empirical literature relevant to the current study.

Risk and Protective Factors in Relation to Health-Compromising Behavior

According to the American Academy of Pediatrics (2001), the three leading health problems among juvenile delinquents are substance-related disorders, sexually transmitted diseases, and mental health disorders. Similarly, the US Department of Health and Human Services (Healthy People 2000, 2000) reports that substance use, suicidality, and violent behavior account for over 70% of illness, disability, and death among adolescents. Patterns of health behavior are established during adolescence and remain
consistent throughout adulthood (Vingilis et al., 2007). Therefore, health care providers need to intervene to decrease health-compromising behaviors during adolescence.

Firth et al. (2009), Hawkins and Catalano (1992) and Jessor and Jessor (1977) postulate that whether an adolescent engages in health-compromising behaviors is determined by the balance between risk and protective factors. Increasing protective factors is associated with more of a decrease in health-compromising behaviors than reducing risk factors (Blum & Ireland, 2004; Cleveland et al., 2008; Firth et al., 2009; Hawkins & Catalano, 1992). In other words, if an adolescent has unchangeable risk factors for engaging in a health-compromising behavior such as gender, victim of sexual abuse, violent home environment, and substance use in the home, than increasing that person’s protective factors will significantly decrease the likelihood that the adolescent will engage in undesirable behavior. When the key protective factors are identified, health care professionals can focus their interventions on increasing these factors which will serve to mediate the relationship between risk factors and the behavior (Firth et al., 2009). Blum and Ireland’s (2004) study highlights this concept.

Blum and Ireland (2004) used logistic regression to examine the risk and protective factors associated with alcohol use, sexual intercourse, and violent behavior in a sample of 15,695 students age 10-18 years. Victim of sexual abuse, parental substance use, and aggression were considered risk factors and the protective factors were family support, school attendance, and church attendance. When more risk factors were added to the model, there was an increase in the risky behaviors. When the protective factors were then added to the model, there was a significant decrease in the risky behaviors.
Before adding any risk factors, 5% of males and 3% of females used alcohol. After adding all three risk factors, 44% of males and 54% of females self-reported drinking alcohol. After the addition of the protective factors to the model where all three risk factors were present, alcohol use fell to 3% for males and 0.8% for females. This pattern was also evident for sexual intercourse and violent behavior (Blum & Ireland, 2004).

The current study is concerned with the health-compromising behaviors of current alcohol use, current drug use, current prescription drug abuse, risky sexual behavior, behavioral manifestations of depressive symptoms, outward display of temper, and engaging in physical fights. In the current study risk factors of these behaviors are hypothesized to be gender, victim of sexual abuse, violent home environment, and substance use in the home. Protective factors are hypothesized to be in school, positive peer influence, perceived family support, mental health care utilization, alcohol treatment health care utilization, and drug treatment health care utilization. It is hypothesized that the protective factors will mediate the relationships between risk factors and health-compromising behaviors in the current study. Theoretical support for the study relationships and selection of variables was presented earlier in this chapter. Empirical support for these relationships is presented below and is organized by behavior.

**Risk and Protective Factors Related to Current Alcohol Use**

Current alcohol use is considered a health-compromising behavior in the current study. Ninety-four percent of a sample of 204 male and female delinquent youths admitted to currently using alcohol (Grimley et al., 2000). The mean age of onset of
alcohol consumption among the participants was 12 years (Grimley et al., 2000). Gender differences were not examined. In contrast, Eklund and Klinteberg (2005) found that 30% of a sample of 966 adolescents in the community self-reported current alcohol use. Children with a history of drinking before the age of 14 are four times more likely to develop alcohol dependence than those who begin drinking after the age of 14 (National Institute on Alcohol Abuse and Alcoholism, 2003). Helstrom et al. (2004) found no gender differences in alcohol use in a sample of 554 incarcerated juveniles.

Risk Factors of Current Alcohol Use

There is empirical support for a relationship between risk factors and current alcohol use in the current study. Risk factors for engaging in alcohol consumption may be largely environmental. In a longitudinal study of 613 pairs of same-sex dizygotic twins age 12-17, likelihood of alcohol use was related to shared environmental factors rather than individual personality differences (Silberg et al., 2003). Peer use and family violence were the most significant predictors of alcohol use.

Having a best friend that drinks alcohol more than triples the likelihood that the adolescent will also drink (Engels & ter Bogt, 2001; Kemppaine, 2009). It is common to see adolescents exhibit the values and behaviors of his or her peer group. An adolescent may begin drinking as a way to fit in with peers (National Institute on Alcohol Abuse and Alcoholism, 2003). However, family environment can also increase the likelihood of adolescent drinking.

Characteristics of the family environment impact adolescent drinking. Witnessing substance use in the home is a significant risk factor of alcohol use among adolescents.
Parental alcohol use was the strongest predictor of underage drinking in a sample of 5445 high school students using a self-report survey (Branstrom et al., 2008). National survey results from 3922 adolescents found that substance use in home by mother was the most significant risk factor of adolescent drinking (Ozer & Fernald, 2008). Johnson et al. (2004) interviewed 401 incarcerated youth and found that substance use in the home, history of sexual abuse, and need for mental health treatment significantly predicted alcohol use in the sample. Having an increased number of risk factors was associated with regular alcohol use in the sample.

Male gender is also a risk factor for adolescent alcohol use. A meta-analysis of six major longitudinal studies that tested predictive models of drinking across one to two generations found that males were more prone to initiating drinking at a younger age and were more likely to be genetically predisposed to alcoholism (Zucker, 2008). Zucker (2008) also found that male drinking is more acceptable by American society than female drinking. Ozer and Fernald’s (2008) results also indicated that male gender predicted adolescent drinking.

*Protective Factors and Current Alcohol Use*

Empirical evidence provides support for the protective factors hypothesized in the current study. Having peers that do not drink and attending school on a regular basis are significantly predictive of not using alcohol and therefore are included as protective factors in the current study and are hypothesized to mediate the relationship between risk factors and current alcohol use. (Andreasson, Sjostrom, & Branstrom, 2007; Branstrom et al., 2008; Kemppaine et al., 2009; Schwin, Schinke, & Trent, 2010). Positive peer
influence was a more significant protective factor against using alcohol for the girls than for the boys in Andreasson et al.’s (2007) study. Zucker (2008) and Voisin, Salazar, Crosby, Diclemente, Yarber, and Staples-Horne (2005) also found school to be a protective factor against adolescent alcohol use using samples of high school students and incarcerated juveniles, respectively.

Critique of the Literature

Much of the data on adolescent alcohol use comes from self-report. However, in a study of 278 male and female incarcerated juveniles, the discrepancy between self-report data on alcohol use and official records documenting use was not statistically significant (Dembo, Wareham, & Schmeidler, 2007). These results lend support for the use of self-report data to measure alcohol use among adolescents. The current study uses self-report data to examine the risk and protective factors related to current alcohol use.

Risk and Protective Factors Related to Current Drug Use

Current drug use is considered a health-compromising behavior in this study. Drug use places adolescents at a higher risk for physical and mental health problems (Dembo et al., 2007). Rates of drug use among delinquent youth are much higher than in the general population. In one study, 90% of a sample of 204 delinquent youth admitted to drug use, which started before the age of 15 (Grimley et al., 2000). In contrast, adolescent drug use in community samples varied from 3% ($n = 177$) to 25% ($n = 1172$) (McClelland, Elkinston, Teplin, & Abram, 2004; Wills et al., 2003). Arrest rates for drug-related violations are rising twice as fast for girls than for boys (Wood, Foy, Goguen, Pynos, & James, 2002).
Marijuana is often cited as the most frequently used illegal drug among juveniles with a history of incarceration (Kingree & Phan, 2002). It has been self-reported that 40% \((n = 819)\) to 72% \((n = 4,644)\) of delinquent juveniles use marijuana (Joseph-DiCaprio et al., 2000; Kim & Fendrich, 2002), compared to 3% of a sample of 966 high school students (Eklund & Klinteberg, 2005). In one sample of 130 female delinquents, the age of first use of marijuana was 12 years (Guthrie et al., 2002). In a sample of 176 incarcerated juveniles, repeat offenders had more than 20% higher rates of marijuana use than non-repeat offenders (Carr & Vandiver, 2001). Helstrom et al. (2004) found no gender differences in marijuana use in a sample of 554 incarcerated juveniles.

Rates of cocaine use are also elevated among delinquent juveniles. Kim and Fendrich (2002) found that 18% of boys and 20% of girls in a sample of 4,644 participants self-reported using cocaine at least once in their lifetime. Six percent of the boys and 9% of the girls also had a history of crack cocaine use (Kim & Fendrich, 2002). The mean age of first use of crack cocaine among a sample of 130 detained females was 14 years (Guthrie et al., 2002).

The high prevalence rates of self-reported amphetamine use (10%), heroin use (4%), and other injectable drug use (19%) among a sample of 4,644 incarcerated youths is also alarming (Kim & Fendrich, 2002). Self-report data of a sample of 130 delinquents revealed that first use of heroin and other injectable drugs occurred at age 14 (Guthrie et al., 2002). Among incarcerated adolescent IV drug users in recent studies, 30% \((n =305)\) to 50% \((n = 925)\) admitted to sharing needles (Godin et al., 2003; Murray, Richardson, Morishima, Owens, & Gretch, 2003).
As many as half of all youth with a history of incarceration may be poly-substance users, as compared to 20% of the general adolescent population (McClelland et al., 2004). Thirty-six percent of a sample of 401 incarcerated juveniles self-reported alcohol and drug use (Johnson et al., 2004). In a sample of almost 1,900 incarcerated juveniles, McClelland et al. (2004) found that alcohol and marijuana were the most frequently used substances self-reported among juvenile delinquents, followed by the combined use of alcohol and marijuana. A smaller percentage of the sample used alcohol, marijuana, and a third substance (McClelland et al., 2004). While males under the age of 16 had a smaller prevalence of poly-use compared to males over age 16, increasing age was not associated with increasing substance use among females (McClelland et al., 2004).

Similarly, a model estimated for age, externalizing problems, internalizing problems, cigarette use, alcohol use, marijuana use, and hard drug use based on data from a sample of 130 incarcerated adolescent females showed a substance use pattern of cigarette-only use, then cigarette and alcohol use, then cigarette, alcohol, and marijuana use, then cigarette, alcohol, marijuana, and crack cocaine use (Helstrom et al., 2004). These findings suggest that adolescents typically use alcohol first before progressing on to marijuana and other illegal drugs and highlight the importance of measuring poly-substance use in samples of detained youth. Blackburn et al. (2007) call for more research on the predictors of drug use among adolescents.

*Risk Factors of Current Drug Use*

Empirical evidence supports the selection of risk factors related to current drug use in the present study. Congruent to alcohol use, having substance-using peers is highly
predictive of adolescent drug use. Peer use was the strongest predictor of drug use in samples of 559, 580, 527, and 91,778 adolescents (Chabrol et al., 2006; Cleveland et al., 2008; Engels & ter Bogt, 2001; Prinstein, Boergers, & Spirito, 2001). Peers may be more influential on the choice to use drugs when family-related risk factors are also present.

In addition, Chabrol et al. (2006) studied the relative contributions of peer and parental use of marijuana in a sample of 559 high school students. Self-report data regarding own use and perception of use/attitudes of peers and parents indicated that peer influence is only significant when parents are perceived as approving the use of drugs. Conversely, another study indicated that having non-substance using peers reduced the risk of using drugs in light of having a substance using parent (Werner & Silbereisen, 2003). However, girls were more strongly affected by family factors and therefore were not as influenced by abstaining peers.

In a similar study, peers increased adolescent drug use only when other risk factors were present (Urberg et al., 2003). Parental substance use was the strongest predictor of drug use in the sample of 477 adolescents. Gender differences were not examined.

Moss, Lynch, and Hardie (2003) also concluded that peers are more influential to adolescent drug use when there is substance use in the home. The longitudinal study collected data from the sample of 539 males and females at age 10, 12, and 15 using scores from the child behavior checklist. Gender differences were not reported. Clearly more research is needed to determine the relative contributions of family and peer influences on adolescent drug use.
Fergusson, Boden, and Horwood’s (2008) study provides further support for the relationships hypothesized in the current study. The researchers conducted a 25 year prospective longitudinal study of risk factors for drug use using a birth cohort of 1,265 children. The correlations between history of sexual abuse ($r = .36$), family violence ($r = .80$), substance use in the home ($r = .87$), substance using peers ($r = .92$), female gender ($r = .94$), and drug use were statistically significant. The results of the studies mentioned above lend support for the selection of risk factors in the current study.

**Protective Factors and Current Drug Use**

Protective factors hypothesized in the current study were selected based on support from empirical evidence and are hypothesized to mediate the relationship between risk factors and current drug use. Family support and peer non-use may be the strongest protective factors against adolescent drug use and therefore are included as protective factors in this study and are hypothesized to mediate the relationship between risk factors and current drug use (Kim, Zane, & Hong, 2002). The negative effects of peer drug use were mediated by family support in a sample of 4,230 adolescents using logistic regression. The girls were more positively influenced by family support than the boys. Engels and Terborgt (2001), Kliwer and Murrelle (2007), and Coley, Votruba-Drzal, and Schindler (2008) achieved the same results using self-report data with samples of 580, 164 and 3,317 adolescents, respectively.

Staying in school also deters adolescents from using drugs and is included as a protective factor in the current study. In a secondary data analysis of 17,215 cases designed to identify the risk and protective factors associated with adolescent drug use,
school attendance was the most significant protective factor (Kliewer & Murrelle, 2007). A longitudinal study of 1084 adolescents indicated that improved school attendance was related to decreased substance use (Engberg & Morral, 2006). Piko and Kovács (2010) found that staying in school was associated with lower rates of drug use among a sample of 881 high school students. Finally, staying in school was associated with decreased drug use among a sample of 105 adolescents with substance-abusing mothers (Leonard, Gwadz, Cleland, Vekaria, & Ferns, 2008).

Drug treatment services protect adolescents from further use. Males are in more need of drug treatment services but girls are more likely to receive professional help (Haavet et al., 2005; Vingilis et al., 2007). Unfortunately, drug treatment services are not available in most juvenile detention centers (Johnson et al., 2004). Drug treatment health care utilization for adolescents has received little attention in the literature and therefore is an area in need of further research (Johnson et al., 2004).

Critique of the Literature

Empirical evidence related to adolescent drug use utilizes self-report data. There are conflicting reports about the accuracy of self-reported drug use among adolescents. Dembo and Schmeidler (2003) found under-reporting of drug use in a sample of 277 incarcerated youths when correlating hair sampling with self-report measures of use. However, in a sample of 33,313 juvenile arrestees, the use of Cohen’s Kappa showed a high correlation between self-report and urinalysis for marijuana (Yacoubian, 2001). The accuracy of self-report measures may vary from drug to drug. For example, Yacoubian (2001) used biological sampling to validate self-reports and found that marijuana use is
more accurately reported than cocaine use. The current study uses anonymous self-report
data to measure drug use.

Another critique of the empirical literature is that many studies examine usage of
only one type of drug, for example Albers and Biener (2002), Kingree and Betz (2003),
and Shrier, Harris, Sternberg, and Beardslee (2001). Other studies address substance use
broadly without measuring the use of any specific drugs such as Anderson (1999), Preski
and Shelton (2001), Stevens, Murphy, and McKnight (2003) and Wislar and Fendrich
(2000). The current study considers the use of several types of illegal drugs: marijuana,
powder or crack cocaine, LSD, inhalants, uppers or downers, heroin or any other
substance for the explicit goal of getting high.

Risk and Protective Factors Related to Current Prescription Drug Abuse

Partnership for a Drug Free America’s 2005 report indicated a shift towards
adolescent prescription drug abuse, which health care professionals now recognize as one
of the most significant developments in substance abuse trends in recent history. The
study of 7,300 students age 12-17 indicated a prescription drug abuse rate of 1 in five
with first usage at age 13 (Partnership for a Drug Free America, 2005). Between 2000
and 2003, there was a 568% increase in the non-medical use of oxycodone/Oxycontin by
adolescents (Critser, 2005).

The Partnership for a Drug Free America’s 2005 report also examines drug use
attitudes. According to the report, 50% of the sample of 7,300 adolescents believed that
using prescription drugs to get high is safer than using illegal street drugs. Fifty-five
percent of the sample believed that abusing cough medicines is not dangerous. Fifty-
seven percent of the sample stated that prescription drugs are easier to obtain than street drugs.

Adolescents may perceive that prescription drugs are not harmful since they can easily be bought over the internet without a prescription. Furthermore, there are websites that describe how to extract the active ingredients out of over the counter medications in order to get high. For example, instructions can be found on the internet regarding how to use pseudoepinephrine, cleaners, and acetone to make the schedule II stimulant known as Methylphenidate/Ritalin. Social networking sites like “MySpace,” which is popular among adolescents, is full of commentary that promotes prescription drug abuse (Schepis, Marlowe, & Forman, 2008).

While males have more overall substance use, females are more likely to abuse prescription drugs (National Institute on Drug Abuse, 2007). The National Institute on Drug Abuse’s 2007 study of 50,000 13 to 18 year olds found that girls are 40% more likely use prescription drugs for non-medical purposes than boys. A secondary data analysis of 18,678 cases from the 2005 US National Survey on Drug Use and Health also showed an increase in prescription drug abuse among adolescent girls (Wu, Pilowsky, & Patkar, 2008).

Smaller samples of community and incarcerated adolescents yielded similar results. Twenty percent of the girls and only 10% of the boys reported abusing at least one prescription drug in the past 14 days in a sample of 741 adolescents (Tobi, Meijer, Tuinstra, & de Jong-van den Berg, 2003). Levine and Coupey (2009) found that 34% of their sample of 849 rural high school students reported lifetime nonmedical use of
prescription medication. One study of found 1,784 incarcerated juveniles found that 17% of the girls and 10% of the boys reported abusing prescription drugs (Alemagno, Stephens, Shaffer-King, & Teasdale, 2009). Specific drugs of choice are not mentioned in these studies; rather “prescription drugs” are measured as a category of drugs. With usage on the rise, more research is needed on the risk and protective factors associated with adolescent prescription drug abuse.

Risk Factors of Current Prescription Drug Abuse

Selection of risk factors in the current study was based on empirical evidence. Family factors are related to adolescent prescription drug abuse (Skurtveit, Selmer, Tverdal, & Furu, 2008). A large national study revealed that 47% of the participants that admitted to prescription drug abuse indicated that they obtain the drugs from substance-abusing parents (Wu et al., 2008). Logistic regression of survey data from 781 adolescent girls and their mothers revealed that maternal acceptance of prescription drug abuse was the strongest predictor of abuse in the girls (Schinke et al., 2008).

Parental and peer factors were significant predictors of prescription drug abuse in a sample of 2,127 adolescents using self-report measures and logistic regression (Spoth, Trudeau, Shin, & Redmond, 2008). Almost 90% of the adolescents that self-reported prescription drug abuse responded that their peers also use the drugs. Peer use was a stronger predictor for the girls (Spoth et al., 2008). Having prescription drug abusing peers was correlated with illegal opioid use at 0.92 in a sample of 15,000 adolescents using logistic regression (Sung, Richter, Vaughan, Johnson, & Thom, 2005).
Protective Factors and Current Prescription Drug Abuse

Robust evidence for the selection of protective factors in the current study comes from the National Institute on Drug Abuse’s 2007 report, *Monitoring the Future: National Results on Adolescent Drug Use*, which reveals that family support, positive peer influence, and attending school are the three strongest protective factors against adolescent prescription drug abuse. These factors were also found to be protective in other studies using self-report data from adolescents (McCabe et al., 2005; McCabe, Boyd, & Young, 2007; Sung et al., 2005). Mental health care utilization may also be a protective factor (Skurtveit et al., 2008). The protective factors in the current study are hypothesized to mediate the relationship between risk factors and current prescription drug use.

Critique of the Literature

Prescription drug abuse among adolescents is a recent trend. The large, national studies focused on this behavior use samples of high school students. There is a dearth of literature examining prescription drug abuse among incarcerated juveniles. More research is also needed to identify the risk and protective factors associated with prescription drug abuse. The current study seeks to address these gaps in the literature.

Risk and Protective Factors Related to Risky Sexual Behavior

Risky sexual behavior is considered a health-compromising behavior in the current study. Experiencing sexual intercourse at an early age is characteristic of incarcerated juveniles (Chang et al., 2003; Godin et al., 2003; Templeton, 2006). Murray et al. (2003) found that over a third of the boys and three quarters of the girls in a sample
of 305 detained youth self-reported having first experienced intercourse before age 13 years. The mean age of first sexual intercourse among the boys was 11.7 years and it was 12.6 years for girls (Murray et al., 2003). Likewise, Kelly et al. (2000) found that 27% of a sample of 200 incarcerated girls had intercourse before age 12. Having first sexual intercourse at age 13 years or younger and female gender was highly related to having intercourse with someone over the age of 18 in a sample of 315 incarcerated youths (Dembo & Schmeidler, 2003).

While self-reported current sexual activity among a sample of 1,350 children aged 10-18 was about 46% (Oman et al., 2002), 90% ($n = 820$) to 97% ($n = 1,200$) of samples of incarcerated youths report current sexual activity (Chang et al., 2003; Grimley et al., 2000). Boys self-reported a higher rate of sexual activity than girls in a sample of 193 incarcerated juveniles (Robertson & Levin, 1999) and 50% of sexually active delinquents admitted to having sexual intercourse with someone the same day that they first met the person (Robertson & Levin, 1999).

Delinquent youth often self-report a high number of lifetime sexual partners (Godin et al., 2003). Sixty-five percent of a mixed-gender sample of 242 incarcerated juveniles age 14-21 self-reported having more than 10 sexual partners and 25% reported having more than 50 partners (Templeton, 2006). Gender differences were not examined. Another study of 204 incarcerated juveniles revealed that the mean lifetime number of sex partners reported by delinquents was 11 (Grimley et al., 2000).

Despite the likelihood of multiple partners, there is decreased self-reported condom use among juvenile delinquents (Robertson & Levin, 1999; Templeton, 2006).
Thirty four percent of a sample of 536 incarcerated juveniles (Godin et al., 2003) and 58% of a sample of 114 female delinquents (Perrin et al., 2003) self-reported that they never use a condom during sexual intercourse. Comparatively, 11% of a community sample of 290 high school students reported inconsistent condom use (Wills et al., 2003).

Twenty percent of a sample of 258 incarcerated males (McLaughlin, Reiner, Reams, & Joost, 1999) and 25% of a sample of 135 males (Kelly et al., 2000) self-reported fathering a child. Thirty-nine percent of a sample of 193 incarcerated girls self-reported a history of being pregnant, with 10% reporting at least two pregnancies (Robertson & Levin, 1999). Female delinquents may have a more positive attitude towards condom use than males, although there is a dearth of research surrounding gender differences and actual condom use (Robertson & Levin, 1999).

Condom nonuse and having a high number of sex partners was associated with the contraction of sexually transmitted diseases (STD) in a sample of 377 male and female incarcerated juveniles (Devieux et al., 2002). Retrospective chart reviews indicate that incarcerated juveniles are fifteen \( (n = 205) \) to forty-two times \( (n = 200) \) more likely to have a STD than adolescents living in the community (Kingree & Phan, 2002; Templeton, 2006). The prevalence rate for STD was 152 times higher in incarcerated females than males (Templeton, 2006).

The Centers for Disease Control tested 24,621 juveniles for STD upon intake at 12 juvenile correctional facilities between 1996 and 1999 and found gonorrhea in four times as many (3.4%-10%) females than males (0.7%-2.6%) (Mertz, Voigt, Hutchins, & Levine, 2002). Furthermore, rate of *Chlamydia* infection was more than double (8%-
19.5%) for females than for males (2.8%-8.9%) (Mertz et al., 2002). Almost 3% of a sample of 5,558 male and female incarcerated juveniles were co-infected with at least two STD (Broussard et al., 2002).

In a sample of 114 incarcerated girls, prostitution was related to an increased risk of contracting a STD (Perrin et al., 2003). Female adolescents are disproportionately arrested and adjudicated for prostitution (Chang et al., 2003; Hoyt & Scherer, 1998; Perrin et al., 2003). Although true prevalence statistics for adolescent prostitution are hard to uncover due to the secluded nature of the activity and the constant geographical movement of the population, Canterbury, McGarvey, Sheldon-Keller, Waite, Reams, and Koopman’s (1995) study found that 2.2% of 1,215 male and female delinquents reported exchanging sex for money.

In addition to the opportunity for monetary gain, prostitution may be explained as an attempt by adolescents to gain love and attention from adults, to gain control over sexual activity, or as a way to regain self-esteem that was taken away as a result of being sexually abused (Harway & Liss, 1999).

Risk Factors of Risky Sexual Behavior

Empirical evidence guided the selection of protective factors, which are hypothesized to mediate the relationship between risk factors and risky sexual behavior. Male gender may be associated with an increase in risky sexual behaviors. Masatu, Kazaura, Nedki, and Mwampambe (2009) surveyed almost 3,500 high school students and found that male gender significantly predicted having multiple sexual partners and not using birth control during the last sexual encounter. These results were replicated in
samples of 159 and 125,000 high school students using self-report survey data (Brady, Dolcini, Harper, & Pollack, 2009; Santelli, Carter, Orr, & Dittus, 2009).

Being a victim of sexual abuse is a risk factor of risky sexual behavior in adolescence. Results from a study of 3,753 females age 15 to 24 indicated that those with a history of sexual victimization were 48% more likely to engage in risky sexual behavior than females with no history of abuse (Pallitto & Murillo, 2008). Children that are sexually abused, particularly in the home environment, during the time that their personal identity is forming suffer life-long consequences. As adolescents, these children have a strong interest in sexual activity, maintain multiple sexual partners, and consider becoming pregnant in order to start a new family and escape from their own abusive home. Girls are sexually abused more than boys and suffer more ill-effects (Daigle et al., 2007).

Witnessing violence in the home is also a risk factor of risky sexual behavior in adolescence (Jessor, 1993; Magnani et al., 2002). Girls that self-reported violence in the home were 27% more likely to engage in sexual activity than girls without that history in the Pallitto and Murillo (2008) study mentioned above. Dembo and Schmeidler (2003) found that adolescent girls were more than twice as likely to have sexual relations if they come from a violent home environment.

Protective Factors and Risky Sexual Behavior

Protective factors are hypothesized to mediate the relationship between risk factors and risky sexual behaviors in the current study and were selected based on support from the literature. Magnani et al. (2002) studied the risk and protective factors
associated with risky sexual behaviors in a sample of 2,328 youth ages 10-24. Positive peer influence, family support, and school attendance were the three most significant protective factors against adolescent risky sexual behavior. These three protective factors were associated with lower levels of sexual activity and consistent condom use. Fisher et al. (2008), Jessor and Jessor (1977), Kogan et al. (2008), Lohman and Billings (2008), and Tevendale et al. (2009) also found that participation in school decreased an adolescent’s risk of engaging in sexual activity.

Laflin et al. (2008) used stepwise regression to determine which risk and protective factors most significantly contributed to virgin status in a sample of 884 adolescents age 13 to 15. Fifty-two of the participants had already engaged in sexual intercourse at time one. By the time two measurement point a year later, 105 of the adolescents had sex. The strongest predictors of whether virginity was kept between the two data collection points were school attendance for both genders and positive peer/family influence for the girls.

Critique of the Literature

Most research examining risky sexual behavior in juvenile delinquents utilizes self-report data to determine prevalence rates of certain behaviors. Use of this method may skew the results, especially since adolescent males are known to exaggerate sexual activity (Wislar & Fendrich, 2000). Moreover, it is hard to validate self-reported sexual behaviors unless it is correlated with partner validation (Kingree & Betz, 2003). There is also social desirability for adolescents not to report sexual activity to adults. Therefore, anonymous self-report may be the best method for measuring risky sexual behavior in
adolescents (Godin et al., 2003). The current study will utilize data that were collected via an anonymous “talking” laptop computer, therefore increasing the likelihood of accurate responses from participants.

There is also a dearth of literature examining the risk and protective factors associated with risky sexual behavior among adolescents. Studies examining these factors using samples of incarcerated juveniles are scarce. The current study addresses this gap in the literature.

Risk and Protective Factors Related to Behavioral Manifestations of Depressive Symptoms

In the current study, behavioral manifestations of depressive symptoms are considered health-compromising. Behavior is a function of mental health status (Grisso, 2004). The juvenile justice system has been described as the nation’s mental health system for troubled adolescents (Blitstein, Murray, Lytle, Birnbaum, & Perry, 2005). It is easy to view juvenile delinquents as ‘bad’ instead of as being in need of psychological treatment (Cashel, Ovaert, & Holliman, 2000).

Juvenile delinquents suffer from high rates of mental health symptoms. Shelton (2004) conducted an ethnographic study and found that 80% of a sample of 30 incarcerated male and female juveniles had impaired mental health status. Gender differences were not examined. In a sample of 1,829 randomly selected juvenile delinquents, more than half met the diagnostic criteria for two or more psychiatric disorders (Abram et al., 2003).
The empirical literature shows that incarcerated juveniles have high rates of mental health disorders when compared to community samples (McReynolds, Wasserman, Fisher, & Lucas, 2007). In a comparison of 56 incarcerated juveniles and 169 high school students, the delinquents had higher rates of negative emotions such as anger and sadness (Plattner et al., 2007). The researchers concluded that the emotions of incarcerated adolescents appeared to be related to their experiences of childhood trauma and abuse (Plattner et al., 2007). According to Csorba et al. (2003), the most prevalent psychiatric diagnosis in adolescence may be depression.

There is conflicting evidence regarding whether adolescent females or males are more likely to manifest symptoms of depression. Helstrom et al. (2004) studied 554 male and female delinquents using a survey with path analysis and found that female gender was strongly related to symptoms of anxiety and depression. However, Ruchkin et al. (2003) assessed depression using a semi-structured interview with 271 incarcerated juveniles and found that 37% more males than females admitted a history of depression.

Clinically, depressed adolescents often display self-harming behaviors including cutting oneself, attempting to hang oneself, and overdosing on pills (American Psychological Association, 2000; Blitstein et al., 2005). Domalanta et al. (2003) used the Beck Depression Inventory to measure depression in a sample of 1,024 incarcerated juveniles and found that over 80% of the subjects that self-harmed were depressed. Females were more likely to self-harm than males.

The most extreme form of self-harm is completing suicide. Sixty-seven percent of adolescent deaths while incarcerated are attributed to suicide (American Academy of
Pediatrics, 2001). In a study of 83 incarcerated youth, 51% admitted suicidal ideation, 60-70% of those with suicidal thoughts had a plan, and 35% of those with a plan had attempted suicide within the past month (Corcoran & Graham, 2002). More research is needed to determine the risk and protective factors associated with behavioral manifestations of depressive symptoms.

Risk Factors of Behavioral Manifestations of Depressive Symptoms

Risk factors for the current study were selected based on support in the literature. A history of family violence has been strongly associated with suicidal ideation and gestures in mixed-gender samples of incarcerated juveniles using cross-sectional self-report survey data (Ruchkin et al., 2003). Sixty-four percent of a sample of 46 incarcerated girls with self-reported family violence had a history of at least one prior suicide attempt (Chamberlain & Moore, 2002). Increased number and types of home violence were related to a higher risk of suicide completion in a retrospective chart review of 151 juvenile suicide completers, and girls were found to have reported depressive symptoms more often than boys (Gray et al., 2002).

Herrenkohl et al. (2009) used latent growth curve modeling to show that high initial levels of family conflict predicted adult stressful life events, which, in turn, predicted adult depressive symptoms among a sample of 754 males and females age 10-27. Furthermore, the models showed that the violence in the home increased significantly each year for participants between ages 14 and 18. Severity of violence was positively correlated with severity of depression symptoms.
History of being abused is also a risk factor of behavioral manifestations of depressive symptoms. Logistic regression analysis of data from a sample of 335 incarcerated juveniles indicates that being female and being a victim of sexual abuse increases the likelihood of suicidal ideation and gestures by more than 30% (Cauffman et al., 2005). Males were also more likely to experience suicidality when having a history of sexual abuse.

The most significant predictor of depression in adulthood was history of childhood abuse among a sample of 378 adults (Powers et al., 2009). Women were more affected by the abuse than the men. The self-reported severity of the abuse predicted depression symptom severity for both sexes.

Substance use in the home is a risk factor for depressive symptoms in adolescence. Parental substance use was the strongest predictor of depressive symptoms in a study of 196 boys age 14 to 16 (Cornelius et al., 2001). Incarcerated girls that self-reported substance use in the home were 70% more likely to have depressive symptoms than girls without that history (Tille & Rose, 2007).

**Protective Factors and Behavioral Manifestations of Depressive Symptoms**

Protective factors for the current study were selected after reviewing relevant research articles and are hypothesized to mediate the relationship between risk factors and behavioral manifestations of depressive symptoms. Family support acts as a protective factor against behavioral manifestations of depressive symptoms in adolescence. Hierarchical multiple regression analyses of self-report data from 314 high school students suggests that family support is the major predictor of suicidal ideation.
(Chioqueta & Stiles, 2007). Family support mediated formation of depressive symptoms in 373 adolescents (Muris et al., 2001).

Staying in school is another protective factor against depressive symptoms. Walsh and Eggert (2007) used self-report survey data from 730 students age 14 to 21 and ANCOVA to examine risk and protective factors associated with suicidal behavior. Attending school was the most significant predictor of suicide risk. Likewise, school attendance was the most significant predictor of suicide risk among 1,083 high school students (Randell, Wang, Herting, & Eggert, 2006).

Staying in school increases the chances that an adolescent is receiving positive support from an adult. Holt et al. (2008) conducted a review of literature on the effects of violent home environment on depression in youths. The researchers found that in the absence of a supportive family, adolescents that were able to connect with an adult at school were less likely to develop depression symptoms.

Finally, mental health care utilization minimizes the risk of behavioral manifestations of depressive symptoms among adolescent with risk factors for depression (Myers, Valentine, Morganthaler, & Melzer, 2006). Logistic regression was used to examine the difference between two groups of incarcerated juveniles with risk factors for depression: those receiving mental health services ($n = 110$) and those without services ($n = 118$). The analysis revealed that those receiving mental health services were 32% less likely to report suicidality (Lopez-Williams, Stoep, Kuo, & Stewart, 2006). There was a more significant decrease of risk for the female participants.
Critique of the Literature

The majority of the empirical literature on adolescents and mental health status use samples that include more males than females, thereby limiting the generalizability of the findings for incarcerated girls. For example, Gover (2004), who studied depression in incarcerated juveniles, used a sample of 377 males and 206 females. Teplin et al. (2002) used a sample containing almost 50% more males than females (1172 versus 657) to study psychiatric symptoms in jailed youth. There were almost three times as many males than females (750 versus 274) in Domalanta et al.’s (2003) study of depression and other psychiatric symptoms in a sample of 1,024 incarcerated juveniles. Researchers need to over-sample females in order to obtain comparable numbers of both sexes since there are more boys than girls held in juvenile detention centers (McReynolds et al., 2007). The current study considers gender as a risk factor of health-compromising behavior.

Many studies on adolescents and mental health status focus on identifying and reporting disorders. However, 75% to 80% of youths diagnosed with a mental health disorder today will not meet the criteria for the disorder a year from now (Grisso, 2004). The wide variation in how “disorder” is defined and measured in the literature also makes it difficult to compare results across studies. Some researchers use the definitions of disorders that are included in the Diagnostic and Statistical Manual of Mental Disorders fourth edition (DSM-IV) diagnostic criteria (American Psychological Association, 2000).

Although the DSM-IV is the predominate system for classifying mental disorders, it is rooted in adult psychopathology (Grisso, 2004). The DSM-IV recognizes that each category of mental disorder is not a “completely discrete entity with absolute boundaries”
Thus, the DSM-IV uses a dimensional system of classification which takes into account the psychiatric clinical disorder (Axis I), personality disorders and mental retardation (Axis II), general medical conditions (Axis III), psychosocial and environmental problems (Axis IV), and global assessment of functioning (Axis V). This type of classification system allows for a wide variety of clinical presentations for one clinical disorder, depending on the other axis diagnoses of individuals with a particular disorder. The diagnostic criteria set forth in the DSM-IV are meant to be used in conjunction with the clinical judgment of a qualified mental health professional (American Psychiatric Association, 2000, p. xxiii).

The DSM-IV does not classify mental health disorders in relation to development and there is an overlapping of conditions in children unlike in adults where distinctly different disorders are manifested. High co-morbidity rates in children reflect a “general psychopathology” consistent with immature development and the consequent lack of differentiation of disorders into discrete categories (Grisso, 2004). For example, the symptoms of depression in children differ from those of adults.

Many researchers use their own definitions of disorder. For example, Stevens et al. (2003) defined mental health disorder as a score on the General Mental Distress Index, while Flannery et al. (2001) defined suicide risk as a score on the Trauma Symptom Checklist depression subscale. Rounds-Bryant, Kristiansen, Fairbank, and Hubbard (1998) used self-reported history of mental health treatment to measure disorder, and a diagnostic interview administered by non-clinicians was used by Corrigan and Watson (2005). Jonson-Reid and Way (2001) measured “serious emotional disturbance” by
identifying type of offense (i.e., violent, sexual). Rather than trying to fit subjects into ill-fitting and inappropriate diagnostic categories, the current study examines self-reported behavioral symptoms of depressive symptoms. The reporting of symptoms will facilitate ease of interpretation, comparison, and replication of results.

Many studies report prevalence rates of symptoms or disorders without indicating whether the condition is situational or chronic or linking the symptoms to other concepts of interest (Domalanta et al., 2003). For example, researchers have studied post-traumatic stress disorder, depression, and conduct disorder among incarcerated juveniles (Abram et al., 2004; Arroyo, 2001; Ayyash-Abdo, 2002; Cashel et al., 2000; Esposito & Clum, 1999; Gover, 2004; Greenwald, 2002; Lipschitz, Morgan, & Southwick, 2002). The current study examines the risk and protective factors associated with behavioral manifestations of depressive symptoms.

**Risk and Protective Factors Related to Outward Display of Temper**

Outward display of temper is considered a health-compromising behavior in the current study. Expressing anger and frustration to others in an inappropriate way can lead to negative consequences for adolescents such as loss of friendships, physical fights, and somatic complaints. Females are more likely to express their anger verbally.

Winstock and Enosh (2008) state that females are more likely to engage in verbal violence because of an underlying biological bias to avoid physical harm. In other words, the brains of females are wired such that an individual will act to protect herself from experiencing physical violence. In contrast, males are wired to physically compete for social status with other males and are less likely to avoid physical confrontation.
In a sample of 46 incarcerated girls, over 70% had committed at least one act of verbal aggression towards another girl within the past 24 hours (Chamberlain & Moore, 2002). These acts included name-calling, negative comments about physical appearance, and threats (Chamberlain & Moore, 2002). Eklund and Klinteberg (2005) examined self-report data from 966 youths and found that girls engaged in acts of social aggression such as bullying, name calling, manipulation, and threatening to withdraw friendship more often than physical acts of aggression. Conversely, the boys committed acts of aggression that were physical more often than social.

**Risk Factors of Outward Display of Temper**

Empirical evidence guided the selection of risk factors in the current study. Family factors predict outward display of temper among adolescents. Preski and Shelton (2001) used stepwise regression in a sample of 106 incarcerated juveniles to examine which family and individual characteristics best predicted verbal aggression. Results indicated that parental substance was the strongest predictor. Violence in the home and history of sexual abuse by a family member were significant predictors of verbal aggression in a sample of 163 females (Holsinger & Holsinger, 2005).

**Protective Factors Related to Outward Display of Temper**

Protective factors in the current study were selected after a review of relevant research and are hypothesized to mediate the relationship between risk factors and outward display of temper. There are gender differences on the influence of protective factors related to outward display of temper. In a study of 5,775 adolescents, family support buffered verbal aggression for the females but not for the males. Similarly,
positive peer influence was protective for only the girls (Kliwer, Murrelle, Mejia, Torres de, & Angold, 2001). More research, such as this study, is needed to further explore these gender differences.

_Critique of the Literature_

There is a dearth of literature examining the risk and protective factors related to outward display of temper in adolescence. Much of the focus of the research remains on physical aggression. Furthermore, many studies explore aggression without differentiating between verbal and physical acts. The current study addresses this gap in the literature by separately examining the risk and protective factors associated with verbal and physical aggression.

*Risk and Protective Factors Related to Engaging in Physical Fights*

Engaging in physical fights is considered a health-compromising behavior in the current study. Physical aggression can lead to negative consequences such as bodily injury, incarceration, and death. Unfortunately, youth violence is commonplace in the United States.

In 2003, 878 US juveniles were incarcerated for homicide, 7,452 for sexual assault, and 7,495 for aggravated assault (Blackburn et al., 2007). Two thirds of a sample of 34 incarcerated boys self-reported that they had physically attacked someone with the intent of doing serious harm (Goldberg, 2007). In a mixed-gender sample of 6,082 incarcerated juveniles, almost 90% admitted to having a history of committing acts of physical aggression towards peers (Jonson-Reid & Way, 2001).
A meta-analysis indicates that cognitive and environmental factors may make an equal contribution to aggressive behavior (Schwartz, 2000). Traumatic experiences during childhood can influence the development of the neuro-anatomical areas of the brain involved in aggression regulation (Grisso, 2004). Neurobiological fear responses that underlie the tendency to react aggressively are more heightened in persons with a trauma history. Engaging in violence allows delinquent youth to achieve a sense of control over their past and current environment (Stea, Anderson, Bishop, & Griffith, 2002) and institutionalization itself increased risk of becoming aggressive in a sample of 108 male and female incarcerated juveniles (Palmer & Farmer, 2002).

**Risk Factors of Engaging in Physical Fights**

Risk factors for the current study were selected based on a review of the literature. Engaging in physical fights may be a result of living in a violent home environment (Gover & MacKenzie, 2003). Adolescents learn how to behave violently by observing and mimicking parental behaviors and may act out their own victimization (Haapasalo & Pokela, 1999; Kakar et al., 2002; Schaffner, 1999). When experienced routinely in the home, violence can become normalized for children and their violent behavior is often acceptable and positively reinforced in the home (Schaffner, 1999; Tarter et al., 2002).

Living in a violent home environment teaches children that violent behavior is normal through modeling and social reinforcement (Clark & Cornelius, 2004). Parents are the first and most significant social role models in a child’s life (Siegel, Welsh, & Senna, 2006). Being ridiculed and belittled in the family was the strongest predictor of aggressive behavior in a sample of 5,396 adolescents age 15 to 18 (Aslund et al., 2009).
Repeatedly being threatened or actually abused, seeing a parent being belittled or beaten, and witnessing substance use in the home may lead children to believe that those behaviors are normal. This is evident in studies where children have reported love for parents and a supportive family life despite the presence of horrific abuse (Kakar et al., 2002).

Actual and threatened violence in the home has been related to an increased probability of violent criminality in adulthood through retrospective chart reviews by as much as 40% in a mixed-gender sample of 86 adult criminals (Preski & Shelton, 2001) to 67% in a mixed-gender sample of 1,575 incarcerated adults (Widom, 2001). Similarly, Coles et al. (2002) correlated detention center offense records with scores on the state-trait anger expression inventory for 99 incarcerated male juveniles and found that the relationship between history of family violence and anger expression was statistically significant at $p < .05$. Falbo et al. (2004) examined detention center records of 190 female incarcerated juveniles for history of childhood abuse and violent offense convictions and found the relationship statistically significant at $p < .05$.

Violence experienced early on in the home also impairs adolescents’ ability to self-regulate emotions, to determine right from wrong, and to accurately appraise the words and actions of others (Baer & Maschi, 2003). The psycho-biological overload caused by witnessing violence is an intolerable condition that alters information processing (Ford, 2002; Heide & Solomon, 2009). In a state of heightened alertness, minor or even neutral stimuli can be interpreted as threatening, leading to further arousal and defensive action, such as avoidance, withdrawal, or aggression. Rather than being
open and flexible, thinking becomes rigid, pessimistic, and categorical causing difficulty in interpreting and responding to social cues (Ford, 2002). In a meta-analysis of six studies, adolescents with a history of experiencing violence more often labeled an emotion as “angry” than as any other label such as “frustrated” or “sad” (Haapasalo & Pokela, 1999). These results were replicated in a qualitative analysis of three cases of female juvenile murderers Heide & Solomon, 2009).

Substance use in the home is another risk factor of engaging in physical fights (Haapasalo, 2000). Carr and Vandiver (2001) conducted a retrospective chart review and found that parental alcohol use was a major risk factor for physical aggression in a sample of 76 male and female youth offenders. In a review article, Marcus-Mendoza and Wright (2004) emphasized that violent criminals often self-report a history of violence in the home that occurred when a parent was under the influence of drugs or alcohol.

Another significant risk factor of violent behavior is a history of prior victimization (Blackburn et al., 2007; DiNapoli, 2003; Gover & MacKenzie, 2003; Haapasalo & Pokela, 1999; Herrera & McCloskey, 2001; Jonson-Reid, 2002; Jonson-Reid & Way, 2001; Lindsey, Carlozzi, & Eells, 2001; Palmer & Farmer, 2002; Smith et al., 2005; Sussman, Skara, Weiner, & Dent, 2004). For example, although males comprise about 25%-33% of all abused children, they are responsible for 95% of juvenile sexual offenses (Jonson-Reid & Way, 2001). Furthermore, a meta-analysis of six studies that examined the relationship between child abuse history and criminality in boys and girls found that 70% to 80% of the incarcerated juvenile participants in the studies have
been sexually abused, as opposed to 3% to 7% of non-incarcerated adolescents (Haapasalo & Pokela, 1999).

The examination of official records provides more evidence for the relationship between history of victimization and violent behavior. Jonson-Reid (2002) examined child protective services records of childhood abuse and juvenile court records for 36,653 male and female incarcerated juveniles and found the relationship statistically significant at $p < .01$. Smith, Ireland, and Thornberry (2005) examined detention center records for a mixed-gender sample 884 incarcerated juveniles and found that child protective services records of childhood maltreatment and court records of violent behavior-related offenses was statistically significant at $p < .01$.

Observing peers that behavior violently increases the risk of engaging in physical fights (Prinstein et al., 2001). Peer participation in violent acts directly influenced violent behavior in a sample of 1,389 middle school students (Sullivan, 2006). A study of 7,167 middle and high school students showed similar results (Rainone, Schmeidler, Frank, & Smith, 2006). Violent peers predicted physical aggression, particularly for the boys.

Males may be at greater risk of engaging in physical fights than females. In a sample of 1,128 adolescents, males were 45% more likely to report engaging in violent physical behavior than the females (Walton & Cunningham, 2009). Winstock and Enosh (2008) and Williams, Fredland, Han, Campbell and Kub (2009) found a similar gender difference in samples of 155 and 185 high school students.
Protective Factors Related to Engaging in Physical Fights

Protective factors for the current study were selected based on empirical evidence and are hypothesized to mediate the relationship between risk factors and engaging in physical fights. Family factors can protect adolescents from engaging in physical fights. A survey of 197 incarcerated juveniles revealed that expectations and values of the family significantly decreased the desire to act violently (Brown, Killian, & Evans, 2003). Family support protected against violent behavior in a sample of 1,389 middle school students (Sullivan, 2006). However, the ability of family support to act as a buffer may decrease with increased violence exposure. In a longitudinal study of a cohort of 1,282 12 year olds, family support buffered the relationship between witnessing violence and violent behavior until violence exposure was severely increased (Sullivan, Kung, & Farrell, 2004).

Positive peer relationships and staying in school act as protective factors against violent behavior. In a study of 124 adolescents, positive peers acted as a protective factor against physical aggression for boys and girls (Hart et al., 2007). School attendance was a protective factor and mediated negative peer influence in a longitudinal study of 1,956 adolescent males. These results indicate that suspending, expelling, or putting kids in detention homes because of violent behavior is counterproductive (Sprott et al., 2005).

Finally, mental health care utilization acts as a protective factor against violent behavior. Thomas, Gourley, and Mele (2005) point out that mental health services, although rarely found in detention centers, do decrease recidivism due to violent offending. Caldwell, Vitacco, and Van Rybroek (2006) matched 101 boys who received
individualized mental health treatment while incarcerated with 101 boys who received usual care. The control group experienced recidivism at a rate more than double that of the treatment group.

There is evidence that contraindicates the conclusions regarding protective factors that are discussed above. For example, Youngstrom, Weist, and Albus (2003), used logistic regression with data from a sample of 320 adolescents age 11 to 18 to study risk and protective factors associated with physical aggression. The results indicate that witnessing violence in the home and being a victim of sexual abuse were associated with violent behavior even after controlling for protective factors such as family support, school attendance, and mental health care utilization (Youngstrom et al., 2003). Undoubtedly, more research is needed on the risk and protective factors related to engaging in physical fights.

Critique of the Literature

Researchers often fail to differentiate between historical, current, and chronic aggression and there are discrepancies in conceptual and operational definitions of target behaviors across studies. Examining questions that are commonly used to measure violent behavior will illustrate these points. For example, there is a big difference in severity of violence between carrying a gun and firing a gun, yet researchers often lump those two actions together under the title “violent behavior” (Blitstein et al., 2005; Flannery et al., 2001; van Wijk et al., 2005; Yexley, Borowsky, & Ireland, 2002).

Questions such as “Have you been in a fight?” do not imply a timeframe and could be interpreted to mean physical fight or an angry exchange of words (Blitstein et
al., 2005; Pederson, Wichstorm, & Blekesaune, 2001). In addition, reliability and validity data are usually not available for measures used to study violent behavior (Osofsky, 2003). Limiting the definition of violence to physical acts leads to underreporting by girls who engage in more relational types of violence and by those who have been legally advised not to respond (DiNapoli, 2003).

Documented court conviction of a violent offense has also been used to measure violent behavior in juveniles. For example, Lennings, Copeland, and Howard (2003) found that 208 out of 290 juvenile subjects had a violent offense conviction. Van Wijk et al. (2005) used court records to identify violent juvenile offenders in order to obtain a sample of all violent offenders. Using court records to measure violent behavior may be more reliable than self-report since adolescents may fear repercussions from self-disclosure of violent acts. This study uses data that has been self-reported anonymously, and therefore does not pose a threat of negative consequences.

Conclusion

Recent advances in the study of adolescent risk behaviors have focused on how environmental factors such as family, school and peers influence behavior (Hair, Park, Thomson, & Moore, 2009). Goldberg (2007) identifies that there is a dearth of literature examining the relationship between environment and behavioral choices in adolescence and calls for more research to be conducted in this area. Firth et al. (2009) recognize that there is a need to understand which risk and protective factor(s) lead to or deter from which behavior(s) among adolescents. The current study addresses this gap in the literature.
The review of the empirical literature indicates that there is evidence to support the conceptual framework and relationships in the current study, which builds on existing research while addressing conflicts and gaps in the literature. A discussion of the methods for the current study is presented in Chapter III. Results are presented in Chapter IV and Chapter V contains the discussion and implications of the study.
CHAPTER III

METHODS

The Secondary Data Analysis

This dissertation study was a secondary data analysis based on Alemagno, Schaffer-King, and Hammel’s (2006) study of risky behavior among incarcerated juveniles. In Alemagno et al.’s (2006) study, a consecutive sample of 256 male and female incarcerated juveniles age 12 to 18 years were asked to complete a survey via a “talking” computer. The participants were able to concurrently hear the questions and read them on the computer screen. The researchers of the primary study were interested in gender differences on health-risk item responses (Alemagno et al., 2006).

The health-risk survey items used in the primary study were originally developed by Alemagno and her team after a review of the literature on adolescent risk factors and included substance use/abuse, sexual behaviors, depression, stress, anxiety, family support, and at-risk friends (Alemagno, Frank, Mosavel, & Butts, 1998). The questions for the one hundred item survey were developed based on a review of literature on adolescent risk behaviors. One hundred sixteen adolescents completed the survey. Then 22 physicians, who had assessed the participants clinically, rated the survey’s ability to accurately report risk status. The survey had an 84.2% accuracy rating from the physicians (Alemagno, Frank, Mosavel, & Butts, 1998).
The survey questions were designed to elicit “yes/no” responses. Adolescents could listen to the items as prerecorded questions via touch-tone telephone in a primary care office and press “1” for “yes” responses and “2” for “no” responses (Alemagno et al., 1998). Descriptive statistics from the primary study revealed information about the incidence and prevalence of health-risk behavior among the incarcerated juveniles in the sample, which served as the catalyst for this secondary data analysis.

The purpose of this dissertation study was to examine how risk factors (gender, victim of sexual abuse, violent home environment and substance use in the home) increase the risk of incarcerated adolescents engaging in health-compromising behaviors (current alcohol, drug, and prescription drug abuse, risky sexual behavior, behavioral manifestations of depressive symptoms, outward display of temper and engaging in physical fights). Additionally, the study examined how protective factors (in school, positive peer influence, perceived family support, and mental health, alcohol and drug treatment) mediate the relationship between risk factors and engaging in health-compromising behaviors. A conceptual framework synthesized from Jessor and Jessor’s (1977) problem behavior theory and a review of the literature guided the analysis. Figure 1 depicts the conceptual model for predicting health-compromising behaviors among incarcerated juveniles.
This dissertation study analyzed survey data collected in Alemagno et al.’s (2006) study. This research was undertaken to add to the existing literature on adolescent health behavior. The specific research questions for this dissertation study were as follows:

Research Questions

1. What is the relationship between risk factors (gender, victim of sexual abuse, violent home environment and substance use in the home) and engaging in health-compromising behaviors (current alcohol, drug and prescription drug abuse, risky
sexual behavior, behavioral manifestations of depressive symptoms, outward display of temper and engaging in physical fights)?

2. What is the relationship between risk factors (gender, victim of sexual abuse, violent home environment and substance use in the home) and protective factors (in school, positive peer influence, perceived family support, and mental health, alcohol and drug treatment)?

3. Do protective factors (in school, positive peer influence, perceived family support, and mental health, alcohol and drug treatment) influence engaging in health-compromising behaviors (current alcohol, drug and prescription drug abuse, risky sexual behavior, behavioral manifestations of depressive symptoms, outward display of temper and engaging in physical fights)?

4. Do protective factors (in school, positive peer influence, perceived family support, mental health, alcohol and drug treatment) mediate the relationship between risk factors (gender, victim of sexual abuse, violent home environment and substance use in the home) and engaging in health-compromising behaviors (current alcohol, drug and prescription drug abuse, risky sexual behavior, behavioral manifestations of depressive symptoms, outward display of temper and engaging in physical fights)?

Sampling and Data Collection Procedures

The primary study examined 256 subjects. However, data collection using the health-risk survey continued after the completion of the primary study. The database for the proposed secondary analysis includes responses to the 100-item health-risk survey from a total of 1,434 males and 292 females (N = 1,726), ages 12 to 18 years. Individual
demographic information about the subjects, such as age and race, was not available. Written permission to use these data for the secondary analysis was obtained from the detention facility director.

The database was cleaned by the principal investigator of the primary study for the purpose of using it in this secondary analysis and did not contain missing cases or identifying information from the juvenile subjects. “Cleaning” of a database is a common process that occurs before statistical analysis. This study was deemed exempt from Institutional Review Board (IRB) review by the IRB at the University of Akron as it was a secondary data analysis.

**Data Analysis**

Secondary data analysis using correlational and linear regression techniques was conducted to examine how risk factors (gender, victim of sexual abuse, violent home environment and substance use in the home) increase the risk of incarcerated adolescents engaging in health-compromising behaviors (current alcohol, drug, and prescription drug abuse, risky sexual behavior, behavioral manifestations of depressive symptoms, outward display of temper and engaging in physical fights). Additionally, the study examined how protective factors (in school, positive peer influence, perceived family support, and mental health, alcohol and drug treatment) mediate the relationship between risk factors and engaging in health-compromising behaviors. The assumptions of regression analysis were met in this study.

First, there must be a linear relationship between the independent and dependent variables. Cohen and Cohen (1983) suggest different ways to meet this assumption
including being informed by theory and a review of literature, which is the approach used in this study. Secondly, the variables must also be normally distributed, measured without error and meet the assumption of homoscedascity. These assumptions were checked during preliminary data screening using SPSS Procedure Frequencies.

This study used linear regression analysis. Linear regression examines the difference in probability of having a certain value on the dependent variable for units with different values on an independent variable. Logistic regression is commonly used to analyze dichotomous variables and predicts the likelihood that Y is equal to 1 (rather than 0), given certain values of X (Kerlinger & Lee, 2000). Even though the items for this study were dichotomous, several items were scaled making the measure continuous. Also, the homoscedasticity assumption of linear regression was met as indicated by preliminary data screening using SPSS Procedure Frequencies which revealed that all of the variables were normally distributed. Finally, statistical simulations show that the significance probabilities from linear and logistic regressions turn out to be nearly identical in over 90% of the cases (Hellevik, 2009). Table 1 lists the study concepts and operational definitions.
Table 1. Study Concepts, Operational Definitions and Empirical Indicators

*Perceived Environment System: Risk Factors*

<table>
<thead>
<tr>
<th>Concept</th>
<th>Operational Definition(s)</th>
<th>Empirical Indicator(s)</th>
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<tbody>
<tr>
<td>Gender</td>
<td>Male or female</td>
<td>Q.1 Are you male</td>
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<tr>
<td>Victim of sexual abuse</td>
<td>Unwanted sexual touch/activity</td>
<td>Q.79 Has anyone ever touched you or done anything to you in a sexual way that you did not want to have done</td>
</tr>
<tr>
<td>Violent home environment</td>
<td>Threatening arguments or physical fights in the home resulting in harm; running away due to fear of going home</td>
<td>Q.83 Have you had arguments at home where you threaten to hurt each other&lt;br&gt;Q.84 Have you had physical fights in your home where you hurt each other&lt;br&gt;Q.86 have you ever stayed away from home for more than two nights because you didn’t want your family to know something or you were afraid to go home</td>
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<tr>
<td>Substance use in the home</td>
<td>Being embarrassed or upset due to substance use occurring in the home</td>
<td>Q.85 Does anyone in your home drink or use drugs enough to embarrass or upset you</td>
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</tbody>
</table>

*Perceived Environment System: Protective Factors*

<table>
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<tr>
<th>Concept</th>
<th>Operational Definition(s)</th>
<th>Empirical Indicator(s)</th>
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<tbody>
<tr>
<td>In school</td>
<td>Currently attending school</td>
<td>Q.81 Right now, are you out of school because you dropped out, or were you expelled or suspended (Reverse coded)</td>
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<tr>
<td>Positive peer influence</td>
<td>Peers who do not skip school to use alcohol or substances; Peers who do not use alcohol or substances to an excess</td>
<td>Q.68 Have you ever skipped classes or missed a whole day of school to drink or get high with friends&lt;br&gt;Q.70 Does your best friend drink or get high a lot (Reverse coded)</td>
</tr>
<tr>
<td>Perceived family support</td>
<td>Family is there to help, is dependable, and contributes to the development of optimal personal development</td>
<td>Q.97 When something goes wrong, is your family there to help you&lt;br&gt;Q.98 Can you depend on your family&lt;br&gt;Q.99 Does your family help you to be the person you want to be</td>
</tr>
<tr>
<td>Mental health care utilization</td>
<td>Received outpatient or inpatient treatment due to school, family, personal, mental health or emotional problems</td>
<td>Q.10 Have you ever been seen by a counselor or psychologist because of school, family, or personal problems&lt;br&gt;Q.11 Have you ever been in the hospital for a mental health or emotional problem</td>
</tr>
<tr>
<td>Alcohol treatment health care utilization</td>
<td>Received treatment for alcohol use</td>
<td>Q.39 Have you ever gone to treatment, a counselor or a doctor because of your use of alcohol</td>
</tr>
<tr>
<td>Drug tx health care utilization</td>
<td>Received treatment for drug use</td>
<td>Q.73 Have you ever gone to treatment, a counselor or a doctor because of your use of drugs</td>
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### Behavioral System: Health-Compromising Behaviors

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<tr>
<th>Concept</th>
<th>Operational Definition(s)</th>
<th>Empirical Indicator(s)</th>
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<tbody>
<tr>
<td>Current alcohol use</td>
<td>Engaged in frequent and excessive alcohol use</td>
<td>Q.30 Do you drink more than one drink of alcohol just about every day</td>
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<td>Q.31 When you drink, do you drink 4 or more drinks during that day</td>
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<td>Q.32 Has drinking ever kept you from doing things you were supposed to do such as going to school or work, or doing your homework</td>
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<td>Q.33 Is it ever hard to stop drinking once you have started</td>
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<td>Q.34 Have you ever wanted to keep drinking after your friends have had enough</td>
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<td>Q.35 Do you ever drink secretly or when you are alone</td>
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<td>Q.36 Have you ever gotten into a fight when you were drinking</td>
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<td></td>
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<td>Q.37 Do people nag you or complain about your drinking</td>
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<tr>
<td>Current drug use</td>
<td>Engaged in use of marijuana, powder/crack cocaine, LSD, inhalants, uppers/downers, heroin or other substance within the past month</td>
<td>Q.41 Did you use marijuana in the past month</td>
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<td>Q.44 Did you use powder or crack cocaine in the past month</td>
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<td>Q.47 Did you use LSD in the past month</td>
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<td>Q.50 Did you use inhalants in the past month</td>
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<td>Q.53 Did you use uppers in the past month</td>
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<td>Q.56 Did you use downers in the past month</td>
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<td>Q.59 Did you use heroin in the past month</td>
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<td>Q.65 Did you use something else in the past month</td>
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<tr>
<td>Current prescription drug abuse</td>
<td>Engaged in prescription drug abuse within the past month</td>
<td>Q.62 Did you use prescription drugs to get high in the past month</td>
</tr>
<tr>
<td>Risky sexual behavior</td>
<td>Sex before the age of 13, unprotected sex and history of a sexually transmitted disease within the past 6 months</td>
<td>Q.75 Were you 13 years old or younger the first time you had sex</td>
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<td>Q.76 Have you had unprotected sex, that is sex where you and your partner did not use a condom or rubber</td>
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<td>Q.96 In the past 6 months have you had any VDs or STDs like herpes, syphilis, the clap, <em>Chlamydia</em>, trick or NGU</td>
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<tr>
<td>Behavioral manifestations of depressive symptoms</td>
<td>Presence of depressive symptoms including loss of interest in activities, feeling sad, tired, hopeless or worthless and difficulty with concentration; suicidal ideation and history of suicide attempts</td>
<td>Q.14 Have you lost interest in things that you usually do at home, at school or with your friends</td>
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<td>Q.15 Do you feel sad or tired most of the time</td>
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<td>Q.16 Do you feel like your life is a mess and will never get better</td>
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<td>Q.17 Is it hard to concentrate at school or work</td>
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<td>Q.18 Do you feel like you are unimportant or worthless</td>
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<td>Q.20 Have you ever thought about killing yourself</td>
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<td>Q.21 Have you ever tried to kill yourself</td>
</tr>
<tr>
<td>Outward display of temper</td>
<td>Hard to control temper</td>
<td>Q.27 Do you have a bad temper that you can’t control sometimes</td>
</tr>
<tr>
<td>Engaging in violence</td>
<td>Engaging in physical fights at home or school</td>
<td>Q.28 Do you get into physical fights at school or home that you regret later</td>
</tr>
</tbody>
</table>
Scales

The scales for this study were constructed from the survey items using a “rational judgment” approach (Friedenberg, 1995). This approach allows the researcher to identify items that are “obviously related to the characteristic being measured” (Worthington & Whittaker, 2006). The student investigator and the primary investigator held a series of meetings to discuss the original intention of the items and consensus on scale items for this study was reached. A scale is a set of items, in this case from the primary survey, which measure a concept (Kerlinger & Lee, 2000). The items on the original survey could only be answered “yes” or “no”. Therefore, the level of data generated from the survey was nominal, meaning that it can only be labeled.

Nominal level data cannot be ranked or added. Therefore, non-parametric statistical analyses are warranted. Non-parametric tests are used for nominal data because any data distribution and variance can be assumed, not just a normal curve with homogeneity (Kerlinger & Lee, 2000). For the purpose of data analysis in this study, “yes” responses were coded with a “1” in SPSS and “no” responses were coded with a “0”. Then eight cumulative scales were constructed for each study variable measured by multiple empirical indicators. The study scales include: 1. violent home environment, 2. positive peer influence, 3. perceived family support, 4. mental health treatment, 5. current alcohol use, 6. current drug use, 7. risky sexual behavior, and 8. behavioral manifestations of depressive symptoms.

Gender, victim of sexual abuse, substance use in the home, in school, alcohol treatment, drug treatment, current prescription drug abuse, outward display of temper and
engaging in physical fights were not scaled since they are single-indicator variables and are measured using data from one survey question. Since there is only one question, it cannot be considered a scale. Single-indicator variables can be used in regression analysis but should be considered a limitation of the analysis (Worhtington & Whittaker, 2006).

According to Kerlinger and Lee (2000), face validity and reliability should be reported when using scales that measure nominal data. Face validity is when the scale items seem to represent the concept. It is often determined by asking experts in the field to examine the items for relevancy (Hardesty & Bearden, 2004). To determine face validity for this study, the student researcher worked with members of the dissertation committee, including the researcher who conducted the primary study, and a doctorally prepared psychologist who acted as a statistician consultant. Together, items that represented the study concepts were carefully selected. Then scale reliability was determined.

Reliability refers to how consistently the scale measures what it supposed to measure (Kerlinger & Lee, 2000). For example, if a scale has strong reliability, then it can be used in multiple populations over time and the researcher can be confident that the scale is measuring the desired concept. Kuder-Richardson Formula 20 (KR-20) was used to measure reliability in the current study because the measures have dichotomous (yes/no) choices (Cortina, 1993). Alpha coefficient was not used because the study measures were not continuous. A KR-20 coefficient of “1” means that the scale items only measure the concept and that there is no error. A coefficient of “0” means that random error is measured rather than the concept of interest. In the social sciences, it is
generally accepted that a KR-20 coefficient of 0.9 and above is excellent, 0.8 is very
good, 0.7 is good, 0.6 is adequate, and 0.5 or below might indicate poor reliability or few
scale items (Munro, 2001).

Scales that contain few items will have a harder time achieving a significant KR-20 (Kerlinger & Lee, 2000). In the current study, five of the eight scales only have two or three items: violent home environment, positive peer influence, perceived family support, mental health treatment, and risky sexual behavior. Therefore, the KR-20 coefficient is expected to be lower for these scales than for the remaining three scales that contain more items. Table 2 lists the number of items and the KR-20 coefficient for each scale.

Table 2. Number of Items and KR-20 Coefficients for Study Scales

<table>
<thead>
<tr>
<th>Scale</th>
<th>Number of Items</th>
<th>KR-20 Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Violent home environment</td>
<td>3</td>
<td>0.517</td>
</tr>
<tr>
<td>Positive peer influence</td>
<td>2</td>
<td>0.533</td>
</tr>
<tr>
<td>Perceived family support</td>
<td>3</td>
<td>0.801</td>
</tr>
<tr>
<td>Mental health treatment</td>
<td>2</td>
<td>0.41</td>
</tr>
<tr>
<td>Current alcohol use</td>
<td>8</td>
<td>0.791</td>
</tr>
<tr>
<td>Current drug use</td>
<td>8</td>
<td>0.423</td>
</tr>
<tr>
<td>Risky sexual behavior</td>
<td>3</td>
<td>0.406</td>
</tr>
<tr>
<td>Behavioral manifestations of</td>
<td>7</td>
<td>0.736</td>
</tr>
<tr>
<td>depressive symptoms</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There are a few points of discussion to be made regarding table 2. First, three of the scales have a reliability coefficient of less than 0.5. Two of these, mental health and risky sexual behavior have only 2 and 3 items, respectively so a low reliability coefficient was expected for these scales. However, current drug use treatment has 8 items so a higher coefficient was expected. One reason the scale has low reliability could be because
the drug use in the sample was low. On average, participants only responded yes to one or fewer items within the scale. More statistical information about this scale is presented in Chapter IV.

Since the scales measure nominal level data, a “1” on a scale means that a participant answered “yes” to one of the scale items. The scale mean would therefore be reporting the average number items to which participants responded “yes”. Standard deviation would describe how closely scores fell in relation to the average number of “yes” responses. For example, did most participants respond yes to a few items or most items? Range would indicate the minimum and maximum number of scale items that yielded a positive response. Means, standard deviation and range for each scale are reported in the results chapter.

The Mediation Model

A mediation model was used in this study to examine how risk and protective factors influence engaging in health-compromising behaviors (current alcohol, drug, and prescription drug abuse, risky sexual behavior, behavioral manifestations of depressive symptoms, outward display of temper and engaging in physical fights) in a sample of incarcerated juveniles because the researcher was interested in finding out if certain protective factors could decrease the chance that incarcerated juveniles from a certain background would engage in health-compromising behaviors. Specifically, if a juvenile had a history of being sexually abused or came from a home where violence or substances were present, could having protective factors in place decrease health risks?
Mediators and moderators are both variables that affect the relationship between a dependent and independent variable. Mediators explain why two variables are associated whereas moderators explain why two variables are not as strongly related as predicted (Bennett, 2000). A mediator is predicted by the independent variable but the moderator is a separate independent variable. This research uses a mediation model.

The key difference between a mediator and a moderator is that a mediator can be predicted by the independent variable (Bennett, 2000). In this study, that means that the protective factors can be predicted by the risk factors. This criterion will be evaluated through a two-step hierarchical regression analysis. A mediation model allows for examination of the mechanism that underlies a relationship between an independent and dependent variable (Wu & Zumbo, 2008). A mediator functions as an explanatory variable where it is hypothesized that there is a direct relationship between the independent and dependent variable and an indirect relationship via the mediator. In mediation, the relationship between the independent and dependent variables is reduced or becomes non-significant when the mediator variables are present (Baron & Kenney, 1986).

In this study, health-compromising behaviors (current alcohol, drug, and prescription drug abuse, risky sexual behavior, behavioral manifestations of depressive symptoms, outward display of temper and engaging in physical fights) are dependent variables and the risk factors (gender, victim of sexual abuse, violent home environment and substance use in the home) are independent variables. Partial mediation occurs when the relationship between the independent variable (risk factors) and the dependent
variable (health-compromising behaviors) is significantly reduced after the inclusion of the mediator variable (protective factors of in school, positive peer influence, perceived family support, and mental health, alcohol and drug treatment) into the model. If the relationship between the risk factors and health-compromising behaviors is reduced to zero after adding the protective factors, mediation is then said to be “complete” (Wu & Zumbo, 2008). In linear regression analysis, the regression coefficient for the indirect effect (i.e., mediation) represents the change in a health-compromising behavior for every unit of change in the risk factor(s) of these behavior(s) that is(are) mediated by the protective factors (Baron & Kenny, 1986).

Baron and Kenney (1986) outline four steps to mediation testing. The first step is to determine that there is a relationship between the independent and dependent variables. In the current study, this step will be accomplished by regressing health-compromising behaviors onto risk factors in the first step of a two-step hierarchical regression analysis and achieving significant results.

Step two of the mediation testing procedure outlined by Baron and Kenney (1986) is to show that the independent (ie, risk factors) and the mediator variables (ie, protective factors) are related. This can be accomplished through regression analysis or significant correlations (Zhao, Lynch, & Chen, 2009). Since three of the protective factors are single-indicator variables, the student researcher determined that the results would be more reliable if correlations were used to satisfy this condition rather than regression analysis.
Step three of mediation testing is to regress health-compromising behaviors onto risk and protective factors simultaneously to determine if the regression coefficients for the protective factors (ie, mediator variables) are statistically significant. This will be accomplished in the second step of the two-step hierarchical regression analysis. Significant results will show that the condition of this step of the mediation testing procedure was satisfied.

The final step of the procedure is to determine if the effect of the risk factors on engaging in health-compromising behaviors is significantly reduced when risk and protective factors are used to predict health-compromising behaviors in the same analysis ie, in the second step of the hierarchical regression analysis. To establish if this was the case, the unstandardized regression coefficient for the risk factors in the second step of the analysis will be compared with those in the first step. When the coefficient is smaller but no longer significant, complete mediation will be present (Jaccard, Guilamo-Ramos, Johansson, & Bouris, 2006). The R squared change statistic will also be examined in this step of the analysis, which will show that more of the variation in health-compromising behaviors is explained when risk and protective factors are in the regression model rather than risk factors alone. Finally, the F change statistic will be obtained in this step to examine the ability of the risk and protective factors together to predict health-compromising behaviors.

Data Analytic Strategy

Data were entered into SPSS Version 15.0 for Windows (SPSS, Inc., Chicago, IL, USA). Initially, data were screened for errors, outliers (extreme scores) and skewness
using SPSS Procedure Frequencies. Means, standard deviations and ranges and/or ns and percentages were produced using SPSS Procedure Frequencies for all of the study measures. There were 1,726 cases for which data were available for analysis. Preliminary data screening revealed that all of the variables were normally distributed.

Zero-order correlations are simple correlation coefficients that are determined from two variables and do not involve a control variable (ie, as opposed to first or second order partial correlations). The zero-order correlations were obtained between and among all study variables and are presented in table format in the results chapter. In addition, a two-step regression analysis was conducted for each health-compromising behavior. In the first step, the health-compromising behavior was regressed on the risk factors. In the second step, each health-compromising behavior was regressed on the risk factors and protective factors.

$R$ is the correlation between the predictive variables (risk and protective factors) and the dependent variables (health-compromising behaviors). $R^2$ is the square root of $R$ and represents the proportion of health-compromising behaviors that can be predicted by knowing the value of the predictor variables. $R^2 Chg$ is the increase in $R$ when other variables are added. $R^2 Chg$ was obtained at each step of the analysis. In step one, the $R^2 Chg$ statistic represents the proportion of variance in health-compromising behaviors that can be predicted by knowing the value of each risk factor. With each risk factor added, there will be an increase in $R^2 Chg$. During the second step of the analysis, it represents the difference between model 1 (risk factors only) and model 2 (risk and protective factors) in predicting health-compromising behaviors. $R^{2\text{adj}}$ is reported for each step and
is a correction based on the number of independent variables in the analysis in relation to the sample size.

The $F$ test statistic indicates whether the model as a whole can predict health-compromising behaviors. The $F^{\text{Chg}}$ test statistic was obtained at each step of the analysis and represents the unique contribution of the variables added in that step to the prediction of health-compromising behaviors. So in step one, the $F^{\text{Chg}}$ statistic represents the ability of the risk factors as a group to predict engaging in health-compromising behaviors and in step two it represents the predictive power of the risk and protective factors together. $F^{\text{Chg}}$ for the second step should be larger then that of the first step because having more factors in the second step should make the model more robust. Results of these analyses are presented in Chapter IV.

Cohen’s (1988) tables for power analysis were used to determine that the study has adequate power. A small effect size of 0.10 and an alpha of 0.05 were assumed. According to the table, the power to detect a correlation of 0.10 in the sample of 1,726 is greater than 0.995 (p. 87).
CHAPTER IV
RESULTS

Organization of Results

The purpose of this study was to examine how risk factors (gender, victim of sexual abuse, violent home environment and substance use in the home) increase the risk of incarcerated adolescents engaging in health-compromising behaviors (current alcohol, drug, and prescription drug abuse, risky sexual behavior, behavioral manifestations of depressive symptoms, outward display of temper and engaging in physical fights). Additionally, the study examined how protective factors (in school, positive peer influence, perceived family support, and mental health, alcohol and drug treatment) mediate the relationship between risk factors and engaging in health-compromising behaviors.

Results are organized in three sections. The first section presents descriptive data for all the variables. The second section describes the results of three zero-order correlational analyses (Pearson’s $r$). The first two analyses examined the relationships between the risk factors and: (a) health-compromising behaviors; and (b) hypothesized protective factors. Since a mediation model was to be tested, the third analysis examined the relationship between health-compromising behaviors and the hypothesized protective factors. These analyses were conducted to identify significant relationships between the mediators and the dependent variables (health-compromising behaviors) to demonstrate
that the mediators affect the outcomes, in accordance with the Baron and Kenny’s (1986) procedure for establishing mediation.

The final section presents the results of a series of hierarchical linear regression analyses testing for mediation; these analyses examined the extent to which the protective factors influenced the relationship between risk factors and health-compromising behaviors (current alcohol and drug use, risky sexual behavior, depressive symptoms, outward displays of temper and physical fights). Linear regression analyses were performed separately for each outcome measure (dependent variable ie, health-compromising behaviors). Additional regression analyses testing for mediation were conducted on: (a) suicidal ideation and (b) suicide attempts. The results of these ad hoc analyses are presented last.

The order of entry of the risk factors (independent variables) and protective factors (mediators) in each regression analysis was the same: At step one, risk factors were entered in the following sequence: (a) gender; (b) victim of sexual abuse; (c) violent home environment; and (d) substance use in the home. At step two, the risk factors were entered again, in the same order as in step one, followed by the hypothesized protective factors in the following sequence: (a) in school; (b) positive peer influence; (c) perceived family support; (d) mental health treatment; (e) alcohol treatment; and (f) drug treatment. Results of each analysis are tabled: Standardized Beta ($B$) is shown for each variable at each step; $R^2_{Chg}$ and $F_{Chg}$ are displayed at steps one and two; and $t$ statistics for each risk and protective factor, along with their significance levels, are presented at step two.
Descriptive Statistics: Scales

Means and standard deviations for the scales are presented in Table 3. A mean of “1” on a scale indicates that on average, participants answered “yes” to one item on the scale. No out-of-range scores were identified (i.e., a score higher than 7.00 for a scale with a maximum score of 7.00) and no data were missing. The standard deviations presented in Table 3 describe how closely scores fell in relation to the average number of “yes” responses. For example, a standard deviation of 0.5 means that there was not a lot of variation in the number of “yes” responses participants gave whereas a standard deviation of 1.5 means that there was more variation in how many “yes” responses participants had.

Table 3. Descriptive Statistics – Scaled Study Measures (N = 1,726)

<table>
<thead>
<tr>
<th>Variable</th>
<th># of items</th>
<th>M</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current Substance Use:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current Alcohol Use</td>
<td>8</td>
<td>0.87</td>
<td>1.57</td>
</tr>
<tr>
<td>Current Drug Use</td>
<td>8</td>
<td>0.52</td>
<td>0.73</td>
</tr>
<tr>
<td>Have you experienced violence in your home environment?</td>
<td>3</td>
<td>0.73</td>
<td>0.91</td>
</tr>
<tr>
<td>Have you engaged in risky sexual behaviors?</td>
<td>3</td>
<td>1.12</td>
<td>0.87</td>
</tr>
<tr>
<td>Behavioral manifestations/depressive symptoms?</td>
<td>7</td>
<td>1.94</td>
<td>1.88</td>
</tr>
<tr>
<td>Experienced suicidal ideation?</td>
<td>2</td>
<td>0.27</td>
<td>0.63</td>
</tr>
<tr>
<td>Do you perceive that your family is supportive?</td>
<td>3</td>
<td>2.44</td>
<td>0.98</td>
</tr>
<tr>
<td>Do you experience positive peer influence?</td>
<td>2</td>
<td>1.41</td>
<td>0.75</td>
</tr>
<tr>
<td>Have you ever gone to a counselor/doctor for mental health care?</td>
<td>2</td>
<td>0.73</td>
<td>0.69</td>
</tr>
</tbody>
</table>
Descriptive Statistics: Single-Indicator Variables

Frequencies \((n)\) and percentages \(\%\) for the ten single-indicator variables including gender, in school, victim of sexual abuse, substance use in the home, positive peer influence, alcohol or drug treatment, current prescription drug abuse, outward display of temper, and engaging in physical fights are presented below in Table 4. Note that data \((ns\) and percentages\) reflect “yes” or positive responses to the indicator representing the respective variable. For example, data showing that 11% \((n = 190)\) of participants reported having been “touched in a sexual way they did not want” means that 11% answered “yes” to this question.
Table 4. Descriptive Statistics – Single-Indicator Variables (Ns and %s) (N = 1,726)

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1,432</td>
<td>83</td>
</tr>
<tr>
<td>Female</td>
<td>294</td>
<td>17</td>
</tr>
<tr>
<td><strong>Currently In School:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>466</td>
<td>27</td>
</tr>
<tr>
<td>Yes</td>
<td>1,260</td>
<td>73</td>
</tr>
<tr>
<td><strong>Current Substance Use:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prescription Drugs</td>
<td>138</td>
<td>8</td>
</tr>
<tr>
<td>Has anyone ever touched you in a sexual way … you did not want?</td>
<td>190</td>
<td>11</td>
</tr>
<tr>
<td>Does anyone in your home drink…enough to embarrass or upset you?</td>
<td>225</td>
<td>13</td>
</tr>
<tr>
<td>Have you ever gone to a counselor /doctor because of your alcohol use?</td>
<td>121</td>
<td>7</td>
</tr>
<tr>
<td>Have you ever gone to a counselor/ doctor because of your drug use?</td>
<td>276</td>
<td>16</td>
</tr>
<tr>
<td>Do you have a bad temper that you can’t control sometimes?</td>
<td>1,018</td>
<td>59</td>
</tr>
<tr>
<td>Do you get into physical fights at school or home that you regret later?</td>
<td>777</td>
<td>45</td>
</tr>
<tr>
<td>Have you ever skipped classes …missed a day of school to drink … with friends?</td>
<td>483</td>
<td>28</td>
</tr>
</tbody>
</table>

**Correlations I: Relationship Between Risk Factors and Health-Compromising Behaviors**

Pearson’s $r$ correlation coefficient was obtained for the correlation between each risk factor and the eight health-compromising behaviors. The coefficient indicates the direction and degree of relationship between each risk factor and each health-compromising behavior. A correlation of “1” indicated a perfect positive relationship while a correlation of “-1” indicates a perfect negative relationship between the two variables (Kerlinger & Lee, 2000). In the social sciences, a correlation coefficient of .0-
.25 is considered minimal; .26-.49 low; .5-.69 moderate; .7-.89 high; .9-1 very high (Munro, 2001, p. 234). Several significant ($p < .001$, two-tailed) relationships were identified between the risk factors and the health-compromising behaviors. These are displayed in Table 5.

### Table 5. Relationship Between Risk Factors and Health-Compromising Behaviors

<table>
<thead>
<tr>
<th>Health-Compromising Behaviors</th>
<th>Risk Factor</th>
<th>Gender (Male)</th>
<th>Victimization$^a$</th>
<th>Exposure to Violence at Home</th>
<th>Substance Abuse at Home</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol Use</td>
<td></td>
<td>.005$^{ns}$</td>
<td>.07*</td>
<td>.19**</td>
<td>.10**</td>
</tr>
<tr>
<td>Drug Use</td>
<td></td>
<td>.02$^{ns}$</td>
<td>.03$^{ns}$</td>
<td>.14**</td>
<td>.07**</td>
</tr>
<tr>
<td>Rx Drug Use</td>
<td></td>
<td>-.01$^{ns}$</td>
<td>.04$^{ns}$</td>
<td>.11**</td>
<td>.06*</td>
</tr>
<tr>
<td>Risky Sex</td>
<td></td>
<td>-.09**</td>
<td>.12**</td>
<td>.08*</td>
<td>.05*</td>
</tr>
<tr>
<td>Depression</td>
<td></td>
<td>-.20**</td>
<td>.28**</td>
<td>.36**</td>
<td>.17**</td>
</tr>
<tr>
<td>Suicide</td>
<td></td>
<td>-.24**</td>
<td>.33**</td>
<td>.31**</td>
<td>.10**</td>
</tr>
<tr>
<td>Temper</td>
<td></td>
<td>-.08**</td>
<td>.10**</td>
<td>.24**</td>
<td>.07**</td>
</tr>
<tr>
<td>Fights</td>
<td></td>
<td>-.09**</td>
<td>.06*</td>
<td>.30**</td>
<td>.09**</td>
</tr>
</tbody>
</table>

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

$^a$ Sexual abuse

Male gender was negatively associated with both depression ($r = -.20$) and suicide ($r = -.24$), meaning that male participants are less likely to be depressed or suicidal. In addition, victim of sexual abuse was associated with both depression ($r = .29$) and suicide ($r = .33$). Participants who have been sexually abused are more likely to experience depression and suicidality. The strongest positive correlations among risk factors and health-compromising behaviors were found between violent home environment and: (a) depression ($r = .36$), (b) suicide ($r = .31$) and (c) physical fights ($r = .30$). This means that if a participant comes from a violent home environment, he or she is more likely to be depressed, suicidal and engage in physical fights than someone who comes from a non-violent home. The remaining correlations are presented in Table 5.
Correlations II: Relationship Between Risk Factors and Protective Factors

Pearson’s $r$ was calculated for all of the correlations between the risk factors and the hypothesized protective factors. Several significant ($p < .001$, two-tailed) relationships were identified between the risk and protective factors. These are displayed in Table 6.

Table 6. Relationship Between Risk Factors and Protective Factors

<table>
<thead>
<tr>
<th>Protective Factors</th>
<th>Gender (Male)</th>
<th>Victimization&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Exposure to Violence at Home</th>
<th>Substance Abuse at Home</th>
</tr>
</thead>
<tbody>
<tr>
<td>In School</td>
<td>.06*</td>
<td>-.06**</td>
<td>-.09**</td>
<td>-.05*</td>
</tr>
<tr>
<td>Positive Peer Influence</td>
<td>.10**</td>
<td>-.10**</td>
<td>-.27**</td>
<td>-.09**</td>
</tr>
<tr>
<td>Perceived Family Support</td>
<td>.09**</td>
<td>-.12**</td>
<td>-.31**</td>
<td>-.29**</td>
</tr>
<tr>
<td>Mental Health Treatment</td>
<td>-.18**</td>
<td>.25**</td>
<td>.24**</td>
<td>.08**</td>
</tr>
<tr>
<td>Alcohol Treatment</td>
<td>.01&lt;sup&gt;ns&lt;/sup&gt;</td>
<td>.05*</td>
<td>.08**</td>
<td>.03&lt;sup&gt;ns&lt;/sup&gt;</td>
</tr>
<tr>
<td>Drug Treatment</td>
<td>.03&lt;sup&gt;ns&lt;/sup&gt;</td>
<td>.04&lt;sup&gt;ns&lt;/sup&gt;</td>
<td>.04&lt;sup&gt;ns&lt;/sup&gt;</td>
<td>-.03&lt;sup&gt;ns&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>*$p < .01; **p < .001</sup>

<sup>a Sexual abuse</sup>

Mental health treatment was negatively associated with male gender ($r = -.18$) and significantly related to being a victim of sexual abuse ($r = .25$). This means that males are less likely to receive mental health treatment. Mental health treatment was also positively associated with violent home environment ($r = .24$). Two protective factors, positive peer influence and perceived family support, were negatively correlated with exposure to violence at home ($r = -.27$ and -.31, respectively). This means that having positive peers and a supportive family is related to not living in a violent home environment. The remaining correlations are shown in Table 5.
Correlations III: Relationship Between Protective Factors and Health Compromising Behaviors

Results of the last correlational analysis are presented in Table 7. Numerous significant ($p < .001$, two-tailed) relationships were identified between the protective factors and the health-compromising behaviors.

Table 7. Relationship Between Protective Factors and Health-Compromising Behaviors

<table>
<thead>
<tr>
<th>Health-Compromising Behaviors</th>
<th>In School Positive Peer Influence</th>
<th>Perceived Family Support</th>
<th>Mental Health Treatment</th>
<th>Alcohol Treatment</th>
<th>Drug Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol Use</td>
<td>-.19**</td>
<td>-.49**</td>
<td>-.04ns</td>
<td>.15**</td>
<td>.42**</td>
</tr>
<tr>
<td>Drug Use</td>
<td>-.21**</td>
<td>-.40**</td>
<td>-.04ns</td>
<td>.10**</td>
<td>.22**</td>
</tr>
<tr>
<td>Rx Drug Use</td>
<td>-.09**</td>
<td>-.19**</td>
<td>-.07**</td>
<td>.10**</td>
<td>.20**</td>
</tr>
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<td>-.21**</td>
<td>-.04ns</td>
<td>.06*</td>
<td>.07*</td>
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<td>.41**</td>
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<td>Temper</td>
<td>-.09**</td>
<td>-.15**</td>
<td>-.05*</td>
<td>.19**</td>
<td>.03ns</td>
</tr>
<tr>
<td>Fights</td>
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<td>-.15**</td>
<td>-.05*</td>
<td>.15**</td>
<td>.07**</td>
</tr>
</tbody>
</table>

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

In school was negatively correlated with both current alcohol use ($r = -.19$) and current drug use ($r = -.21$). This means that participants who stay in school are less likely to use alcohol and drugs. Positive peer influence was also negatively associated with suicide ($r = -.16$), displays of temper ($r = -.15$) and physical fighting ($r = -.15$). For the participants, having positive peers decreases suicidality and engaging in verbal and physical violence. The strongest positive correlations between protective factors and health-compromising behaviors were found between: mental health treatment and...
depression ($r = .36$), mental health treatment and suicide ($r = .41$), alcohol treatment and current alcohol use ($r = .42$) and drug treatment and current drug use ($r = .28$). These findings suggest that participants did receive help for mental health, alcohol and drug issues.

Mediation Model Testing: Introduction and Hypotheses

Each model hypothesized that: (a) risk factors (gender, victimization, violent home environment and substance use in the home) would account for significant differences in variance explained in each health-compromising behavior tested; and (b) protective factors (in school, positive peer influence, perceived family support, and mental health, alcohol and drug treatment) would mediate the relationship between these risk factors and the respective health-compromising behavior tested. Each research question was addressed for each behavior and there is one hypothesis for each behavior. The results below are organized by hypothesis/behavior.

**Research Questions**

1. What is the relationship between risk factors (gender, victim of sexual abuse, violent home environment and substance use in the home) and engaging in health-compromising behaviors (current alcohol, drug and prescription drug abuse, risky sexual behavior, behavioral manifestations of depressive symptoms, outward display of temper and engaging in physical fights)?

2. What is the relationship between risk factors (gender, victim of sexual abuse, violent home environment and substance use in the home) and protective factors
(in school, positive peer influence, perceived family support, and mental health, alcohol and drug treatment)?

3. Do protective factors (in school, positive peer influence, perceived family support, and mental health, alcohol and drug treatment) influence engaging in health-compromising behaviors (current alcohol, drug and prescription drug abuse, risky sexual behavior, behavioral manifestations of depressive symptoms, outward display of temper and engaging in physical fights)?

4. Do protective factors (in school, positive peer influence, perceived family support, mental health, alcohol and drug treatment) mediate the relationship between risk factors (gender, victim of sexual abuse, violent home environment and substance use in the home) and engaging in health-compromising behaviors (current alcohol, drug and prescription drug abuse, risky sexual behavior, behavioral manifestations of depressive symptoms, outward display of temper and engaging in physical fights)?

Hypothesis 1: Current Alcohol Use

Protective factors (in school, positive peer influence, perceived family support, and mental health care utilization, alcohol treatment health care utilization and drug treatment health care utilization) will partially mediate the relationship between risk factors (gender, victim of sexual abuse, violent home environment and substance use) and engaging in the health-compromising behavior of current alcohol use among incarcerated juveniles.
Results of the first phase of the analysis produced a model that significantly predicted alcohol use, accounting for 4.4% of the variance explained in this health-compromising behavior ($R^2 = .046$, $R^2_{adj} = .04$, $F_{Chg} = 20.65$, $p < .001$). Surprisingly, “substance use in the home” did not significantly contribute to the model ($p = 0.52$). A summary of the regression model is presented below in Table 8.

The second phase of the analysis addressed two questions: (a) was the relationship between one or more of the risk factors and current alcohol use partially or entirely mediated by the entry at step two of one or more protective factors; and (b) to what extent did adding protective factors improve the ability of the model to account for variance explained in current alcohol use.

Results showed that the relationship between violent home environment and current alcohol use was at least partially mediated by in school, alcohol treatment, and positive peer influence. This indicates that for participants who come from a violent home environment, staying in school, receiving alcohol treatment and having positive peers will decrease the risk of using alcohol.

Adding protective factors improved the model’s ability to account for variance explained in current alcohol use. With the addition of protective factors, the model accounted for 35.9% of variance explained in current alcohol use ($R^2_{Chg} = .31$, $R^2_{adj} = .35$, $F_{Chg} = 96.14$, $p < .001$). In the social sciences, a model that explains 30% to 50% of the variance in the dependent variable (health-compromising behaviors) is considered “good” (Munro, 2001). Table 8 shows that in school, alcohol treatment, and positive peer influence were the protective factors contributing the most to variance explained in
current alcohol use. Perceived family support, and alcohol and mental health treatment
did not contribute significantly to the model.

Table 8. Regression Analysis 1: Risk Factors and Mediators of Current Alcohol Use

<table>
<thead>
<tr>
<th>Risk Factor</th>
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<th>$R^2$ Change</th>
<th>$F$ Change</th>
<th>$T$</th>
<th>sig</th>
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</table>

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

*a Standardized Beta
Hypothesis 2: Current Drug Use

Protective factors (in school, positive peer influence, perceived family, and mental health care utilization, alcohol treatment health care utilization and drug treatment health care utilization) will partially mediate the relationship between risk factors (gender, victim of sexual abuse, violent home environment and substance use) and engaging in the health-compromising behavior of current drug use among incarcerated juveniles.

Results of the first phase of the analysis produced a model that significantly predicted current drug use, accounting for 2.2% of the variance explained in this health-compromising behavior ($R^2 = .024$, $R^2_{adj} = .02$, $F_{Chg} = 10.52$, $p < .001$), with the exceptions of victim of sexual abuse and substance use in the home. It is surprising, and contradictory to the literature, that reporting substance use in the home would not
increase the likelihood of using drugs. A summary of the regression model is presented in Table 9.

Results showed that the relationship between violent home environment and current drug use was at least partially mediated by in school, positive peer influence and alcohol and drug treatment. This finding again emphasizes the importance of staying in school and having positive peers on the reduction of health-compromising behaviors. Gender significantly predicted current drug use before and after the addition of protective factors. Adding protective factors did improve the model’s ability to account for variance explained in current drug use. With the addition of protective factors, the model now accounted for nearly 21% of variance explained in current drug use ($R_{chg}^2 = .19$, $R_{adj}^2 = .21$, $F_{Chg} = 46.33$, $p < .001$). Table 9 shows that in school, positive peer influence and alcohol and drug treatment were the protective factors contributing the most to variance explained in current drug use. Perceived family support and mental health treatment did not contribute significantly to the model.
Table 9. Regression Analysis 2: Risk Factors and Mediators of Current Drug Use

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</table>

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

*a Standardized Beta


**Hypothesis 3: Current Prescription Drug Abuse**

Protective factors (in school, positive peer influence, perceived family support, and mental health care utilization, alcohol treatment health care utilization and drug treatment health care utilization) will partially mediate the relationship between risk factors (gender, victim of sexual abuse, violent home environment and substance use) and engaging in the health-compromising behavior of current prescription drug abuse among incarcerated juveniles.

Results of the first phase of the analysis produced a model that significantly predicted current prescription drug abuse, accounting for 1.1% of the overall variance in
this health-compromising behavior \((R^2 = .013, R_{adj}^2 = .011, F_{Chg} = 5.87, p < .001)\). The low variance may be attributed to the low rate of prescription drug abuse in the sample. It appears that violent home environment contributed the most to understanding the variance explained in current prescription drug abuse, with Standardized Beta \((B) = .10\). Gender, victim of sexual abuse and substance use in the home contributed very little to variance explained in this outcome. A summary of the regression model is presented in Table 10.

Table 10. Regression Analysis 3: Risk Factors and Mediators of Current Prescription Drug Abuse

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>(B^a)</th>
<th>(R^2) Change</th>
<th>(F) Change</th>
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*\(p < .01; \ **p < .001\)

\(a\) Standardized Beta
Again, the relationship between violent home environment and current prescription drug abuse was mediated by in school, positive peer influence and alcohol and drug treatment. With the addition of protective factors, the model now accounted for 7.0% of variance explained in current prescription drug abuse ($R^2_{chg} = .06$, $R^2_{adj} = .07$, $F_{Chg} = 13.93$, $p < .001$). Staying in school and having positive peers is inversely related to abusing prescription drugs. Table 10 shows that positive peer influence and drug treatment contributed the most to the variance explained in current prescription drug use. The contribution made by in school was marginally significant with $p = .05$. Perceived family support and mental health, drug, and alcohol treatment did not significantly contribute to the model. This is an unexpected finding since the literature supports a
connection between alcohol and drug use and prescription drug abuse. Again, this finding may be the result of a low prevalence rate of prescription drug abuse in the sample.

**Hypothesis 4: Risky Sexual Behaviors**

Protective factors (in school, positive peer influence, perceived family support, and mental health care utilization, alcohol treatment health care utilization and drug treatment health care utilization) will partially mediate the relationship between risk factors (gender, victim of sexual abuse, violent home environment and substance use) and engaging in the health-compromising behavior of risky sexual behavior among incarcerated juveniles.

Results of the first phase of the analysis produced a model that significantly predicted risky sexual behaviors, accounting for 1.7% of the variance in this outcome ($R^2 = .019, R^2_{adj} = .017, F_{Chg} = 8.52 p < .001$). The only predictor of risky sexual behaviors that contributed significantly to the model was victim of sexual abuse with a Standardized Beta ($B$) = -.003. The literature suggested a relationship between gender and risky sexual abuse, but the relationship was not supported with this analysis. Gender, substance use in the home and violent home environment contributed very little to the variance explained in this outcome. A summary of the regression model is presented in Table 11.

In school and positive peer influence partially mediated the relationship between violent home environment and risky sexual behavior. While significant, the model with the protective factors added predicted a small percentage (5.6%) of the variance in risky sexual behaviors ($R^2_{Chg} = .06, R^2_{adj} = .05, F_{Chg} =1 1.22, p < .001$).
Table 11 shows that both positive peer influence and in school were the protective factors contributing the most to the variance explained in risky sexual behaviors. Contributions made by perceived family support, mental health, drug, and alcohol treatment were negligible.

Table 11. Regression Analysis 4: Risk Factors and Mediators of Risky Sexual Behaviors

<table>
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<th>Risk Factor</th>
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<th>R&lt;sup&gt;2&lt;/sup&gt; Change</th>
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*a Standardized Beta

*p < .01; **p < .001
Hypothesis 5: Behavioral Manifestations of Depressive Symptoms

Protective factors (in school, positive peer influence, perceived family support, and mental health care utilization, alcohol treatment health care utilization and drug treatment health care utilization) will partially mediate the relationship between risk factors (gender, victim of sexual abuse, violent home environment and substance use) and engaging in the health-compromising behavior of behavioral manifestation of depressive symptoms among incarcerated juveniles.

Results of the first phase of the analysis produced a model that significantly predicted behavioral manifestations of depressive symptoms, accounting for 17.6% of the variance explained in this health-compromising behavior ($R^2 = .18$, $R^2_{adj} = .017$, $F_{Chg} = 93.21, p < .001$). Victim of sexual abuse, violent home environment, and substance use in...
the home contributed the most to variance explained in depressive symptoms. A summary of the regression model is presented in Table 12.

Positive peer influence, perceived family support and mental health treatment partially mediated the relationship between substance use in the home and behavioral manifestations of depressive symptoms. That is, if participants come from a home were substances are used, they are less likely to be depressed if they have family support and positive peers. These protective factors did not mediate either the relationship between victim of sexual abuse and behavioral manifestations of depressive symptoms or the relationship between violent home environment and behavioral manifestations of depressive symptoms, indicating that other protective factors need to be identified to keep adolescents who have been sexually abused or who come from a violent home from developing depression.

With the addition of protective factors, the model now accounted for 26% of the variance explained in behavioral manifestations of depressive symptoms ($R^2_{\text{chg}} = .08$, $R^2_{\text{adj}} = .26$, $F_{\text{chg}} = 61.62$, $p < .001$). Table 12 shows that positive peer influence, perceived family support and mental health treatment contributed the most to variance explained in behavioral manifestations of depressive symptoms. Interestingly, contributions made by in school and alcohol and drug treatment were negligible.
Table 12. Regression Analysis 5: Risk Factors and Mediators of Behavioral Symptoms of Depression

<table>
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* $p < .01$; ** $p < .001$

*a Standardized Beta*
Hypothesis 6: Outward Display of Temper

Protective factors (in school, positive peer influence, perceived family support, and mental health care utilization, alcohol treatment health care utilization and drug treatment health care utilization) will partially mediate the relationship between risk factors (gender, victim of sexual abuse, violent home environment and substance use) and engaging in the health-compromising behavior of outward display of temper among incarcerated juveniles.
Results of the first phase of the analysis produced a model that significantly predicted outward displays of temper, accounting for 6.0% of the variance explained in this health-compromising behavior ($R^2 = .06$, $R^2_{\text{adj}} = .06$, $F_{\text{Chg}} = 28.76$, $p < .001$).

Surprisingly, violent home environment was the only predictor of this behavior that significantly contributed to the model. A summary of the regression model is presented in Table 13.

Table 13. Regression Analysis 6: Risk Factors and Mediators of Outward Display of Temper

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<thead>
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<th>$F_{\text{Change}}$</th>
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<td>5.73</td>
<td>.000**</td>
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</table>

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

*a Standardized Beta
In school, positive peer influence and mental health treatment did not mediate the relationship between violent home environment and outward displays of temper. These findings indicate that for participants who came from a violent home, even positive peer influence will not decrease the risk of engaging in verbal violence. Furthermore, mental health care seems to inadequately help adolescents from a violent home to regulate their behavior. With the addition of protective factors, the model now accounted for 8.7% of the variance explained in outward displays of temper ($R^2_{chg} = .03$, $R^2_{adj} = .08$, $F_{Chg} = 17.46, p < .001$). Table 13 shows that both in school, positive peer influence and mental health treatment contributed the most to variance explained in outward displays of temper.
temper. Contributions made by perceived family support and drug and alcohol treatment were negligible.

**Hypothesis 7: Engaging in Physical Fights**

Protective factors (in school, positive peer influence, perceived family support, and mental health care utilization, alcohol treatment health care utilization and drug treatment health care utilization) will partially mediate the relationship between risk factors (gender, victim of sexual abuse, violent home environment and substance use) and engaging in the health-compromising behavior of engaging in physical fights among incarcerated juveniles.

Results of the first phase of the analysis produced a model that significantly predicted engaging in physical fights, accounting for 9.0% of the variance explained in this health-compromising behavior ($R^2 = .09$, $R^2_{adj} = .09$, $F_{Chg} = 43.63$, $p < .001$). Violent home environment was the only predictor of this behavior that significantly contributed to the model. A summary of the regression model is presented below in Table 14. In school, perceived family support and mental health treatment did not mediate the relationship between violent home environment and engaging in physical fights.

With the addition of protective factors, the model now accounted for 10.0% of the variance explained in engaging in physical fights ($R^2_{chg} = .01$, $R^2_{adj} = .10$, $F_{Chg} = 20.39$, $p < .001$). Table 14 shows that in school, perceived family support and mental health treatment contributed the most to variance explained in engaging in physical fights. Contributions made by positive peer influence were negligible.
Table 14. Regression Analysis 7: Risk Factors and Mediators of Physical Fights

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<tr>
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<th>$F$ Change</th>
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</tbody>
</table>

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

*a* Standardized Beta
Ad Hoc Analyses

Three ad hoc analyses were conducted to examine additional relationships between risk factors and health-compromising behaviors. The first analysis included “first drink before age 10” as a risk factor of current alcohol use. Next, suicidal ideation and history of suicide attempts were examined as health-compromising behaviors. The results of these analyses are presented below. Results of the first analysis (“first drink before age 10”) are discussed in the text only while results of the latter two analyses are presented in Tables 15 and 16, respectively.
Including ‘First Drink Before Age 10’ as a Predictor of Current Alcohol Use

Results of the first phase of the analysis produced a model that significantly predicted current alcohol use, accounting for 10.9% of the variance explained ($R^2 = .11$, $R^2_{adj} = .109$, $F_{Chg} = 43.17$, $p < .001$). Male gender, violent home environment, substance use in the home, and first drink before age 10 significantly contributed to the model. With the addition of protective factors in the model, the relationship between substance use in the home and current alcohol use was no longer significant, reflecting a situation where complete mediation was present. These findings support early intervention for underage drinkers.

With the addition of protective factors, the model now accounted for 37.2% of the variance explained in current alcohol use ($R^2_{chg} = .01$, $R^2_{adj} = .37$, $F_{Chg} = 93.98$, $p < .001$). Asking one question, about drinking alcohol before the age of ten, can give the clinician a good indication of whether adolescents are currently drinking. In school and positive peer influence significantly contributed to the model.

Suicidal Ideation

Results of the first phase of the analysis produced a model that significantly predicted suicidal ideation, accounting for 15.2% of the variance explained in this health-compromising behavior ($R^2 = .15$, $R^2_{adj} = .15$, $F_{Chg} = 78.48$, $p < .001$). All risk factors except substance use in the home significantly contributed to the model. A summary of the regression model is presented in Table 15.

In school, positive peers, perceived family support, mental health and alcohol treatment did not mediate the relationship between violent home environment and
engaging in physical fights. The relationship between gender and suicidal ideation was partially mediated by the protective factors. Relationships between victim of sexual abuse, violent home environment and suicidal ideation were not mediated.

With the addition of protective factors, the model now accounted for 23.0% of the variance explained in suicidal ideation ($R^2_{chg} = .08$, $R^2_{adj} = .23$, $F_{Chg} = 52.39$, $p < .001$).

Table 15. Regression Analysis 8: Risk Factors and Mediators of Suicidal Ideation

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

*a Standardized Beta
History of Suicide Attempts

Results of the first phase of the analysis produced a model that significantly predicted suicide attempts, accounting for 14.6% of the variance explained in this health-compromising behavior ($R^2 = .14$, $R^2_{adj} = .14$, $F_{Chg} = 73.53$, $p < .001$). All risk factors except substance use in the home significantly contributed to the model. A summary of the regression model is presented in Table 16.
Table 16. Regression Analysis 9: Risk Factors and Mediators of Suicide Attempts

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<th>$F$ Change</th>
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*p < .01; **p < .001

*a Standardized Beta
Gender, victim of sexual abuse, and violent home environment significantly contributed to the model even after the addition of protective factors. These findings indicate that males, victims of sexual abuse, and adolescents from a violent home are more likely to have a history of suicide attempts. With the addition of protective factors, the model now accounted for 21.6% of the variance explained in suicide attempts ($R^2_{chg} = .07$, $R^2_{adj} = .21$, $F_{chg} = 48.62$, $p < .001$). Table 16 shows that in school, positive peer influence, and perceived family support did not contribute to the variance explained in suicide attempts.

While mental health treatment did contribute to the model, it was not in the expected direction ($B = .27$). That is, it was in the positive direction, reflecting a positive association between mental health care utilization and suicide attempts. It does not
indicate that mental health care served as a protective factor against suicide attempts. This finding suggests that mental health care, as it is currently delivered, may not be as helpful as it could be for adolescents from a violent home environment.

If the Standardized Beta had been negative, that would have reflected an inverse relationship between mental health care and suicide attempts: as mental health care utilization increased, such attempts would have decreased. However, this does not appear to be the case. Thus, the significant findings with respect to mental health, drug and alcohol treatment utilization should be interpreted with caution, since they may not be serving as protective factors but as indicators of a serious health-compromising behavior.
CHAPTER V
DISCUSSION

Overview

This secondary analysis contributed to furthering the science of nursing. These findings emphasize the importance of screening adolescents across the care continuum for violence in the home. Early identification of adolescents at risk would enable clinicians to provide interventions that would lead to better health outcomes.

These findings also lend support for designing interventions that enhance protective factors in order to decrease adolescents’ risk of engaging in health-compromising behaviors, particularly for adolescents from a violent home. This chapter contains a discussion of the descriptive findings, limitations of the study, and implications for future research. Variable names are used throughout the chapter, and those variables with the most support and relevance are presented first.

Descriptive Findings

In general, the relationships hypothesized in the conceptual framework were in the expected direction and supported the literature on health-compromising behaviors among adolescents. Adding the protective factors to the model did increase the amount of variance explained in health-compromising behaviors. Violent home environment, being in school, and positive peer influence were the strongest predictors of health-compromising behavior in the study.
For this group of adolescents, coming from a violent home significantly increased their risk of engaging in health-compromising behaviors such as drinking alcohol, using substances, engaging in risky sexual behavior, displaying behaviors that are a result of depression, and engaging in verbal and physical violence. Even with the addition of protective factors, youths from a violent home who were included in this study remained at high risk for making poor health-related choices. The discussion of study results below is organized by behavior.

**Current Alcohol Use**

Almost 36% of the adolescents in the sample self-reported using alcohol. This finding is lower than what was expected, since prevalence rates of alcohol use among incarcerated juveniles are reported as high as 90% in the literature (Gunthrie et al., 2002). The lower prevalence rate of current alcohol use found in this study may be a result of the age span of the sample, which included participants age 12-18. While age was not collected for each participant in the study, it is reported in the original study that the age of the children taken into the detention facility ranges from age 12-18. According to Jessor and Jessor (1977) and Grimely et al (2000), the likelihood that an adolescent uses alcohol increases significantly with each year of age. Therefore, an 18 year old is more likely to use alcohol than a 12 year old. Inaccurate reporting or scaling issues may have also contributed to these results.

Adding risk and protective factors to the model accounted for almost 36% of the variance in current alcohol use. While there is evidence supporting violence in the home as a risk factor for alcohol use among adolescents, it is usually not the most significant
one (Johnson, Cho, Fendrich, Graf, Kelly-Wilson, & Pickup, 2004; Silberg, Rutter, D’Onofrio, & Eaves, 2003). However, in this sample, living in a violent home was the most significant risk factor for drinking alcohol. Even when the adolescents had positive peers, they still chose to drink alcohol. The relationship between living in a violent home environment and the behavior of drinking alcohol needs to be further investigated.

Surprisingly, substance use in the home was not a significant risk factor for drinking alcohol in this study. This is contradictory to the literature which does identify exposure to substance use in the home environment as a key risk factor for alcohol use among adolescents (Johnson, Cho, Fendrich, Graf, Kelly-Wilson, & Pickup, 2004; Sjostrom, & Andreasson, 2007). The item that measured substance use in the home asked whether someone in the home environment uses alcohol or substances enough to be embarrassing or upsetting to the participant. Kilewer and Murrelle (2007) pointed out that adolescents are often unaware of the extent of the substance use of adults in the home, which could help to explain why only 13% of participants responded “yes” to this item.

Moreover, adolescents who come from a home where substance use occurs may view the behavior as normal and may not be embarrassed or upset by the use. The wording of this item may not have been useful for gathering data in this study from these participants. How adolescents become aware of and perceive substance use among adults in the home could be the focus of future research.

Staying in school, positive peer influence, and alcohol treatment utilization were the strongest protective factors against alcohol use in the study. These findings were expected and supported by the literature on adolescent alcohol use (Engels & Bög, 2001;
Silberg, Rutter, D’Onofrio, & Eaves, 2003). However, adolescents from a violent home who self-reported having these protective factors still admitted to drinking alcohol. In other words, even having some positive influences against drinking were not enough to deter the adolescents from deciding to use alcohol. Clearly, more research is needed to identify how to further reduce the risk of alcohol use among adolescents from a violent home environment.

Current Drug Use

Fifty-one percent of the sample self-reported current drug use, which is consistent with rates found in other studies (Dembo et al, 2007; McCleeland et al., 2004). Marijuana was the most commonly used drug among participants (41%). This finding was expected since marijuana is often cited as the most frequently used illegal drug among incarcerated juveniles, with prevalence rates for use reported as high as 40-72% in the literature (Joseph-DiCaprio, 2002; Kim & Fendrich, 2002).

Nearly 22% of the variance in the model for current drug use was explained by adding risk and protective factors. Congruent with alcohol use, violent home environment was the strongest predictor of current drug use in this study. This is again an unexpected finding which warrants further research since peers usually contribute more to adolescent drug behavior than characteristics of the home environment (Preski & Shelton, 2001; Smith et al., 2005; Werner & Silbereisen, 2003).

Interestingly, substance use in the home did not significantly contribute to the model for current drug use, which contradicts the literature on adolescent drug use (Urberg, Luo, Pilgrim, & Degirmencioglu, 2003). This finding may again be the result of
having a sample of 12-18 year olds where drug use behaviors vary greatly based on age (Grimely et al, 2000).

Staying in school, positive peer influence and alcohol and drug treatment were the strongest protective factors in the model for current drug use. However, for adolescents from a violent home, having these protective factors did not outweigh the effects of a violent home. Those youths from a violent home were still at increased risk of using drugs despite having positive peer influence and staying in school. This finding provides further evidence for the relationship between violent home environment and health-compromising behavior.

Current Prescription Drug Abuse

Only 8% of the study participants self-reported abusing prescription drugs. This is much lower than the 20% self-reported in the national sample of adolescents from the community used by Partnership for a Drug Free America in 2005. There is a dearth of research on prescription drug abuse rates among incarcerated juveniles. However, since 47% of adolescents who abuse prescription drugs report obtaining the drugs from a parent, there could be a difference in prescription drug use between parents of incarcerated juveniles and parents of other adolescents living in the community (Wu, Pilowsky, & Patkar, 2008). More research is needed to establish prevalence rates of prescription drug abuse among incarcerated juveniles and to determine how their use differs from that of other adolescents in the community.

Risk and protective factors added during the second step of the analysis for this study resulted in 7% of the variance explained in the model for prescription drug abuse.
Similar to current alcohol and drug use, violent home environment was the strongest predictor of prescription drug abuse in this sample. Once again, substance use in the home did not contribute to the model despite empirical evidence for it as a significant risk factor for prescription drug abuse among adolescents (Wu, Pilowsky, & Patkar, 2008). Positive peer influence was the most significant protective factor against prescription drug abuse in the sample. This finding was expected and reinforced the evidence on the relationship between peer influence and adolescent drug behavior (Spoth, Trudeau, Chungyeol, & Redman, 2008). For adolescents from a violent home, having positive peers was not enough to deter them from abusing prescription drugs. In school, and alcohol and drug treatment were also significant protective factors.

In summary, all three of the substance use-related measures in this study (current alcohol/drug use and prescription drug abuse) yielded like results. Positive peers and staying in school partially mediated the relationship between violent home environment and the substance-using behavior. These findings indicate that prevention programs targeting adolescents should use strategies that emphasize having peers who don’t use alcohol or drugs and the importance of staying in school.

However, these findings also suggest that adolescents from a violent home may require different alcohol and drug prevention strategies then youth who do not come from a violent home. Alcohol and drug interventions for adolescents from a violent home need to incorporate more than just peer and school strategies. More research is required to develop and test strategies that would successfully reduce risk in this population. The
importance of screening adolescents for violence in the home is again highlighted by these findings.

*Risky Sexual Behavior*

Almost 72% of the sample in this study self-reported risky sexual behavior. This percentage is comparable to the 75% found in a sample of incarcerated juveniles by Chang et al (2003), although rates as high as 90-97% have also been reported (Templeton, 2005; Grimley et al., 2000). Almost 6% of the variance in the model of risky sexual behavior was explained by adding risk and protective factors during the second step of the analysis.

The only predictor of behavior in this sample was victim of sexual abuse, a finding which confirms the literature on childhood sexual abuse (Holsinger & Holsinger, 2005; Pallitto & Murillo, 2008). Adolescents who have been sexually abused are at an increased risk of engaging in sexual behaviors. While girls usually report higher rates of sexual abuse than boys, there were no gender differences in this sample of adolescents (Daigle, Cullen, & Wright, 2007). Boys in this sample may have experienced an unusually high rate of abuse. For example, they may have been used as a sex object to gain money or drugs for a parent, as often reported by boys in the clinical setting on pediatric psychiatric hospital units.

It is also interesting to note that even though the participants self-reported a history of sexual abuse, violent home environment did not make a significant contribution to the model despite support from the literature (Jessor, 1993; Magnani, Karim, Weiss, Bond, Lemba, Musonda, & Morgan, 2002). This finding suggests that the
sexual abuse did not take place in the home environment. Again, the participants in this sample may have been prostituted or otherwise abused outside of the home such as in school or peer-based settings. Further research is needed to determine the context of the abuse.

In school and positive peer influence were the most significant protective factors in the model for risky sexual behavior in this study. The ability of staying in school to partially mediate the relationship between victim of sexual abuse and risky sexual behavior reinforces evidence presented in the literature (Fisher, Eke, Cance, Hawkins, & Lam, 2008; Kogan, Brody, Gibbons, Murry, Cutrona, Simons, Wingood, & Diclemente, 2008; Laflin, Wang, & Barry, 2008; Lohman, & Billings, 2008; Tevendale, Lightfoot, & Slocum, 2009; Magnani, Karim, Weiss, Bond, Lemba, & Morgan, 2002). Positive peer influence also partially mediated the relationship, a finding that was expected and supported in other studies (Magnani et al, 2002). Adolescents who are sexually abused will be at risk for engaging in risky sexual behaviors even if they have positive peer influence and stay in school.

However, contrary to the literature on adolescent sexual behavior, supportive family did not significantly contribute to the model for risky sexual behavior in this study. Studies that provided evidence for supportive family as a protective factor were conducted primarily with community samples (Kogan et al., 2008; Laflin et al., 2008; Lohman & Billings, 2008; Magnani et al, 2002). Even if adolescents perceive that their family is supportive, those who have been sexually abused will still engage in risky sexual behaviors. This finding could suggest that factors outside of the family are more
influential on sexual behavior for incarcerated juveniles than for other adolescents in the community. For example, adolescents who belong to a gang may be more prone to negative peer influence than those who are not gang members. Clearly this is an area needing further research.

Behavioral Manifestations of Depressive Symptoms

Almost 70% of the sample in this study self-reported behavioral manifestations of depressive symptoms. This finding is comparable to the 80% rate found in samples of incarcerated juveniles reported by Shelton (2004) and Domalanta et al (2003). Girls in the sample were more likely to self-report depression and mental health treatment utilization than the boys. This was an expected finding and is supported in the literature (Gray, Achilles, Keller, Tate, Haggard, Rolfs, Cazier, Workman, & McMahon, 2002; Helstrom et al, 2004).

Twenty-six percent of the variance in the model for behavioral manifestations of depressive symptoms was explained when the risk and protective factors were included in the analysis. Three risk factors contributed significantly to the model: violent home environment, victim of sexual abuse, and substance use in the home. These findings were expected and confirm the evidence on behavioral manifestations of depressive symptoms that was presented in Chapter II (Cauffman, Scholle, Mulvey, & Kelleher, 2005; Cornelius, Pringle, Jernigan, Kirisci, & Clark, 2001; Herrenkohl, Kosterman, Hawkins, & Mason, 2009; Holt, Buckley, & Whelan, 2008; Powers, Ressler, & Bradley, 2009; Skybo, 2005; Smith et al, 2005).
Positive peer influence, perceived family support and mental health treatment were the most significant protective factors in the analysis, a finding supported by the literature (Chioqueta, & Stiles, 2007; Muris, Schmidt, Lambrichs, & Meesters, 2001). These factors partially mediated the relationship between substance use in the home and behavioral manifestations of depressive symptoms. Violent home environment and victim of sexual abuse were still significant after the addition of protective factors. Adolescents who live in a violent home and were sexually abused will still show evidence of depression despite having a supportive family and positive peers. Further research is needed to explore how to reduce the risk of depression among adolescents who live in a violent home and have been sexually victimized since the hypothesized protective factors did not fully mediate the relationship.

*Outward Display of Temper*

Sixty percent of the sample in this study self-reported outward display of temper. This finding is comparable to the rate of 70% reported by Chamberlain and Moore (2002). Almost 9% of the variance in the model for outward display of temper was explained by the addition of risk and protective factors.

Despite evidence in the literature for other risk factors, violent home environment was the only significant predictor of outward display of temper in this study. Adolescents who reported living in a violent home were more likely to engage in verbal violence. The literature does provide evidence for family factors as having the most influence on adolescent violence behavior (Holsinger & Holsinger, 2005). However, substance use in the home did not contribute significantly to the model.
Gender differences were not found in this study even though there is evidence that girls are more likely to engage in verbal violence than boys (Kliewer, Murrelle, Mejia, Torres, & Angold, 2001). Many of the studies focusing on forms of female violence use girl-only samples (Chamberlain & Moore, 2002; Holsinger & Holsinger, 2005; Preski & Shelton, 2001). Since the sample for this study contained more than four times as many boys ($n = 1434$) than girls ($n = 292$), the results may have been influenced by the gender characteristics of the sample.

The protective factors that contributed the most to the model were in school, positive peer influence and mental health treatment. However, these factors did not mediate the relationship between violent home environment and outward display of temper. So despite having protective factors, the adolescents from violent homes were more likely to verbally abuse others. More research is needed to determine other factors that contribute to outward display of temper among adolescents and how to decrease this behavior among adolescents from a violent home.

*Engaging in Physical Fights*

Forty-five percent of the participants in this study self-reported engaging in physical fights. This is lower than findings of 75% to 90% in samples of incarcerated juveniles from other studies (Goldberg, 2007; Jonson-Reid & Way, 2001; Respectively). Gender differences were not found in this sample although in the literature there is evidence that boys are more likely to commit violent physical acts than girls (Rainone, Schmeidler, Frank, & Smith, 2006). Adding risk and protective factors to the model explained 10% of the variance in engaging in physical fights.
Congruent with outward display of temper, violent home environment was the only predictor of engaging in physical fights. Adolescents who reported living in a violent home were at increased risk of acting out physically. Victim of sexual abuse was not a significant contributor to engaging in physical fights despite strong support from the literature (Blackburn et al., 2007; DiNapoli, 2003, Grover & MacKenzie, 2003; Haapasalo & Pokela, 1999; Herrera & McCloskey, 2001; Jonson-Reid, 2002; Jonson-Reid & Way, 2001; Lindsey et al., 2001; Palmer & Farmer, 2002; Smith et al., 2005; Sussman et al., 2004). Of the protective factors, in school and family support contributed to the model the most but did not mediate the relationship between violent home environment and engaging in violence. Therefore, for adolescents from a violent home, protective factors decreased some of the risk for engaging in physical violence but did not take away all of the risk.

Interestingly, the adolescents in this study engaged in physical fights even when peers were not displaying violent behavior. This is contrary to other research reports which indicate that adolescents often mimic the behaviors of their peers (Prinstein, Boegers, & Spirito, 2001; Rainone, Schmeidler, Frank, & Smith, 2006; Sullivan, 2006). Further research is needed to explore how positive peers influence the risk of engaging in violent behavior among adolescents. It may be that the influence of negative peers on adolescent behavior is stronger than the influence of positive ones.

In summary, both of the violence-related measures in this study (outward display of temper and engaging in physical fights) resulted in similar findings. Living in a violent home environment had a direct relationship on engaging in verbal and physical violence.
for the adolescents in the study. It is unclear why the results from this study did not show gender differences on the violent behavior measures. More research is needed to determine interventions that reduce violent behavior among adolescent boys and girls.

**First Drink Before Age 10 as a Predictor of Current Alcohol Use**

As an ad hoc analysis, “first drink before age 10” was added as a predictor of current alcohol use. The decision to conduct this ad hoc analysis was based on evidence that early onset of drinking is related to increased alcohol dependency later in life (Branstrom, Sjostrom, & Andreasson, 2007). This addition to the model increased the amount of variance explained in current alcohol use by 2% (from almost 36% to almost 38%).

Consuming the first alcoholic drink before age 10 contributed significantly to the model for current alcohol use as did violent home environment. Moreover, now male gender and substance use in the home were also risk factors for alcohol use. These risk factors were not significant until early onset of drinking was included in the analysis. These results indicate that males are more likely than females to drink alcohol before the age of ten. In addition, adolescents who drink alcohol at an early age are most likely to have seen family members using substances in the home.

Staying in school and positive peer influence completely mediated the relationship between substance use in the home and current alcohol use. This finding suggests that it is important for young children to attend school and have positive peers, especially when there are substance users and acts of violence in the home.
Suicide

The role of risk and protective factors on the health-compromising behaviors of suicidal ideation and history of suicide attempts were examined in ad hoc analyses. Corcoran and Graham (2002) found that 51% of a sample of incarcerated juveniles expressed suicidality. In this study, the rates of suicidality were much lower. Almost 10% of the participants self-reported suicidal ideation while 8% admitted to a history of a prior suicide attempt. Girls were more likely to report suicidality than boys, a finding which confirms results from other studies (Cauffman, Scholle, Mulvey, & Kelleher, 2005; Helstrom et al, 2004).

Twenty-three percent of the variance in the model for suicidal ideation and 22% of the variance for history of suicide attempts was explained with the addition of risk and protective factors. All of the risk factors except for substance use in the home made a significant contribution to the model for both types of suicidality. In school, positive peers, perceived family support and mental health and alcohol treatment partially mediated the relationship between the risk factors and suicidal ideation but were non-significant for suicide attempts. This finding suggests that history of suicide attempt may be a more severe mental health issue than suicidal ideation. Also, adolescents who attempt suicide may be too sick to gain positive effects from peers and school.

Mental health treatment was hypothesized to be a protective factor against suicide. While it did contribute to the model of suicidal ideation, it was associated with an increase in suicide attempts. In other words, adolescents receiving mental health services were more likely to attempt suicide. This finding suggests that the mental health
care services were inadequate for the adolescents or that only severely mentally ill participants were accessing treatment. Again, further research is needed on adolescent mental health care utilization and quality.

Together, the findings from this study make a case for the importance of the early detection and treatment of children from a violent home environment. More than any other risk factor in the study, violence in the home was related to increased participation in behaviors such as alcohol and substance use, risky sexual abuse, behavioral manifestations of depressive symptoms, and engaging in verbal and physical violence. While peers and staying in school reduced the risk of engaging in the behaviors, these two factors alone were not enough to eliminate the risk all together. Therefore, more research is needed to identify other factors that contribute to or reduce risky behaviors among adolescents.

Limitations of the Study

The data and hypotheses of this study were limited by the fact that it was a secondary data analysis. Therefore, the selection of survey items had already occurred and items available to include in scales were subsequently limited. Characteristics of the original sampling procedure also limited this study. For example, the cross-sectional nature of the original data collection represented only a one-time measurement of the adolescents’ perceptions. This limited the ability to make causal inferences. The nominal level of data yielded from the original survey also limited the scaling and therefore measurements possible in this study.
Furthermore, having demographic data such as age for the sample would have added to the generalizability of the study since there are dramatic changes in health-compromising behaviors among age groups (Blum & Ireland, 2004). Having race, number of times incarcerated, and family data would have added to the analysis.

Another major limitation of the study is that the health-compromising behaviors in the study’s hypothesized conceptual framework are correlates of each other. Multicollinearity leads to measurement error and skewed results. Tolerance and variance inflation factors testing would have shown multicollinearity and a strategy could have been put in place to decrease error (Kerlinger & Lee, 2000).

A longitudinal study design would be better able to establish temporal ordering of the variables of interest to this research. A limitation of the study is that temporality had to be assumed from nominal level data. Certainly some measurement error occurred as a result of this aspect of the research design.

Another limitation of this research is that the data for the primary study were gathered in 2004. Trends in adolescent risk behaviors, socioeconomic and cultural factors may have changed in the last six years. Therefore, results from this study should be interpreted with caution.

Finally, there are most certainly other influences on adolescent behavior that were not examined in this study such as genetics and personality. Some of the health-compromising behaviors, such as prescription drug abuse and risky sexual behavior, had a low amount of the variance explained by the predictive models, indicating that other
factors contribute to the behavior besides those identified in the study. Future research is needed to identify factors in those cases.

Implications for Clinical Practice and Future Research

The results of this study may be generalizable to other groups of adolescents since the prevalence rates of health-compromising behaviors and the results of the analyses using data from this sample are similar to those found in large national studies. Collectively, these results have important clinical relevance. The findings from this study also provide direction for future research.

Implications for Clinical Practice

These findings suggest that adolescents should be asked about characteristics of their home environment upon admission to a detention facility, inpatient hospital unit, and at outpatient clinics since those from a violent home may be at increased risk for alcohol and substance use, prescription drug abuse, depression, suicide, and engaging in violent behavior. Additionally, these adolescents may have decreased support from family and peers. Therefore, the plan of care for the adolescent from a violent home could include individual interventions such as assessment of depression and behavior, and support group attendance as well as family interventions such as education and therapy.

Since violent home environment was the most statistically significant risk factor for engaging in health-compromising behaviors in this study, it may be clinically relevant to develop a home violence screening tool to be used at the point of care with pediatric patients. Screening for home violence would aid in the early identification of the
presence of this risk factor and the implementation of an appropriate plan of care. The development of such a screening tool could be the focus of a future research project.

Clinicians working with adolescents should also inquire about school attendance and peers. Staying in school is a strong protective factor against behaviors such as alcohol/drug use and risky sexual behaviors. Questions about peer affiliations and attitudes will aid the clinician in assessing the potential for peer influence on behavior. If the adolescent has positive peers, there is a decreased likelihood that he/she will engage in unhealthy behaviors. Peer support groups and mentoring programs may be effective interventions for adolescents that do not have positive peers.

Professionals who work with adolescents should also be aware of the cultural differences that exist between themselves, as largely middle-class individuals, and impoverished adolescents. Differing values and life experiences could cause a barrier in communication and lead to a therapeutic impasse. For example, deliberately throwing a pencil across the room at a peer would be considered violent to a professional but mild to an adolescent who has seen multiple peers shot and killed in the streets.

Finally, since the underlying emotion of health-compromising behaviors seems to be anger, clinicians, teachers, and others who work with adolescents should learn to recognize and intervene during the early phases of angry behavior to prevent more catastrophic consequences. Children who demonstrate anger in school should receive immediate intervention. Undergraduate curriculum for teachers and nurses should specifically include anger assessment and management techniques.
Implications for Future Research

While this study added to the literature on health-compromising behaviors, more research is needed to identify the risk and protective factors that influence health-related behavior among adolescents. These findings suggest that living in a violent home environment is strongly associated with poor health-related choices among adolescents. Future research should focus on developing and testing interventions that will decrease health-compromising behaviors among adolescents from violent homes.

Furthermore, these findings indicate that future research should focus on developing and testing interventions that will help adolescents to stay in school and choose positive peers as friends. School based interventions should be developed and tested. Peer mentoring programs should also be developed and evaluated.

Finally, future research should focus on developing and testing interventions for adolescents in mental health care settings. There is much to be learned about how to best optimize mental health in adolescent clients. For example, to what extent does individual therapy help adolescents? Is group therapy beneficial? How can family therapy be incorporated into the treatment plan of adolescents utilizing mental health care services?

Conclusion

In summary, perhaps the most important implication of this study is that even when adolescents have positive peers and stay in school, it is hard for them to overcome the negative effects of growing up in a violent home. The idea that adolescents are resilient may not be entirely true for those who have experienced extreme and chronic violence. This study provides evidence for a relationship between violence in the home
and adolescent health outcomes. Therefore, efforts to decrease health-compromising behaviors among adolescents should focus on screening for violence in the home and providing family-centered interventions.
References


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