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An Investigation of Internalizing, Externalizing, and Comorbid Behavioral Symptomatology as Predictors of Maladaptive Risky Behavior During Adolescence

Allyse A. Hetrick
Lehigh University

An Investigation of Internalizing, Externalizing, and Comorbid Behavioral Symptomatology as Predictors of Maladaptive Risky Behavior During Adolescence

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Allyse Anna Hetrick

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_____
Date

_____
Lee Kern, Ph.D.
Dissertation Director
Professor of Special Education
Lehigh University

_____
Accepted Date

Committee Members:

_____
George J. DuPaul, Ph.D.
Professor of School Psychology
Lehigh University

_____
Brenna K. Wood, Ph.D.
Associate Professor of Special Education
Lehigh University

_____
Bridget V. Dever, Ph.D.
Associate Professor of School Psychology
Lehigh University

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Abstract

Adolescent risk-taking can potentially result in serious individual and societal consequences. Previous research demonstrates that emotional and behavioral problems, particularly externalizing behaviors, are significantly associated with an array of risky behaviors such as substance use, sexual behavior, injury, and violence. However, the relationship between internalizing problems and risky behavior during adolescence remains unclear. Further, there is confusion surrounding comorbid internalizing and externalizing psychopathology and its relationship to risk-taking. Therefore, this study investigated the relationships between maladaptive risky behavior (i.e., smoking/tobacco use, alcohol use, marijuana use, sexual behaviors, and depression/suicidal behavior) and internalizing, externalizing, and comorbid behavioral symptoms. Participants included 476 high school students who met criteria for a large-scale intervention study due to emotional and behavioral difficulties. Analyses indicated that adolescents with comorbid symptomatology engaged in the highest rates of risky behavior. A significant interaction was found between behavioral symptoms and parent monitoring, indicating that students with internalizing problems and low levels of parent monitoring reported the highest levels of depression/suicidal behavior. Overall, internalizing dimensions of physical symptoms and somatic complaints had strong, positive associations with risky behavior, whereas social anxiety and harm avoidance had strong, but negative associations with risky behavior. Somatic complaints and separation anxiety both moderated the relationship between externalizing symptoms and suicidal behavior. Findings suggest that among adolescents with externalizing problems, high levels of co-occurring somatic complaints may decrease the risk of depression/suicidal behavior. Alternatively, high levels of separation anxiety may increase the risk of depression/suicidal behavior among adolescents with externalizing problems.

Chapter 1

Statement of the Problem

Adolescent Risk-Taking

Adolescence has often been described as an important developmental period characterized by exploration, experimentation, and increased risk-taking (Gardner & Steinberg, 2005; Steinberg, 2008). Taking risks can be an adaptive way for youth to test their strengths, limitations, and the boundaries of societal norms as they prepare for adulthood (Rudasill, Reio, Stipanovic, & Taylor, 2010). Conversely, adolescent behavior can be maladaptive when an activity's risks outweigh any potential benefits (Rudasill et al., 2010). Thus, there is a continuum of behaviors ranging from low to high risk.

The Centers for Disease Control and Prevention (CDC) has delineated the following priority health risk behaviors that are detrimental to physical health and emotional well-being: (a) behaviors that contribute to unintentional injuries and violence, (b) sexual behaviors that contribute to unintended pregnancy and sexually transmitted infections, (c) alcohol and drug use, (d) tobacco use, (e) unhealthy dietary behaviors, and (f) inadequate physical activity (Brener et al., 2013). These risk behaviors have been targeted because they are often established during childhood and adolescence, become interrelated, extend well into adulthood, and have been shown to contribute markedly to the leading causes of death, disability, and social problems among youth and adults in the United States (Eaton et al., 2012). Furthermore, these risk behaviors and subsequent emotional and physical health consequences are preventable (Eaton et al., 2012).

Current research on risky behavior focuses primarily on maladaptive risk behaviors (e.g., alcohol and drug use, tobacco use, early sexual activity) and the array of short- and long-term

consequences associated with these behaviors. Adolescents who engage in maladaptive risky behavior, particularly at an early age, are at greater risk of developing health and social problems that extend into adulthood (Harris, Duncan, & Boisjoly, 2002; Thompson et al., 2011). Although there has been considerable investigation of various factors that contribute to risky behavior among adolescents in the United States, research is limited in identifying the specific behavioral factors that are related to risky behavior among secondary students with disabilities, particularly those with or at risk for emotional and behavioral disorders (EBD).

Factors Associated with Adolescent Risk Behaviors

Certain characteristics are associated with increased likelihood of adolescents engaging in maladaptive risky behavior. Research demonstrates that demographic characteristics of gender, socioeconomic status, and presence of a disability (Blum, Kelly, & Ireland, 2001; Byrnes, Miller, & Schafer, 1999; Crandall, Magnusson, Novilla, Novilla, & Dyer, 2017; Ponnet, 2014) are associated with increased risk taking. In addition, peer influence (Allen, Porter, & McFarland, 2006; Gardner & Steinberg, 2005) and demonstration of externalizing and internalizing behaviors (Boislard, Dussault, Brendgen, & Vitaro, 2013; Hoeve, McReynolds, & Wasserman, 2013; Hoeve, McReynolds & Wasserman, 2015; Sarver, McCart, Sheidow, & Letourneau, 2014) are linked to adolescents' engagement in maladaptive risky behavior.

Demographic characteristics. Research indicates that demographic characteristics of socioeconomic status, gender, and disability status contribute to increased risk-taking behavior. Research has consistently linked socioeconomic status and high levels of family financial stress to adolescent risk-taking (Ponnet, Van Leeuwen, Wouters, & Mortelmans, 2015; Shelleby et al., 2014). Youth from low income families are more likely than those from higher income families to have early and unprotected sexual intercourse, engage in delinquent acts, and drop out of

school (Crandall et al., 2017; Edwards, Mumford, Shillingford, & Serra-Roldan, 2007; Harris et al., 2002). According to Ponnet (2014), engaging in risky behaviors is a maladaptive coping mechanism that some adolescents may adopt in the face of poverty or other family stressors.

In terms of gender, numerous studies indicate that adolescent males engage in risky behavior to a greater extent than their female peers (Byrnes et al., 1999). Specifically, male adolescents are more likely to engage in behaviors such as substance use, risky sexual behavior, and delinquency (Byrnes et al., 1999, Zimmer-Gembeck & Helfand, 2008). In contrast, national survey data indicate that female high school students report greater involvement with other types of risk such as physical dating violence, sexual dating violence, and suicidal ideation (Kann et al., 2016). Although gender differences in risk-taking are well-documented, specific reasons and factors leading to these differences have been largely unexplored.

Additionally, there is evidence that students who have been identified with disabilities are more likely to engage in risky behavior than their non-identified peers (Blum et al., 2001). A growing body of research suggests that adolescents with disabilities are more likely to engage in smoking, alcohol and drug use, sexual risk behavior, and behaviors that lead to injury (Blum et al., 2001; Lawrence, Mitrou, Sawyer, & Zubrick, 2010; Raman, Boyce, & Pickett, 2009; Sarver et al., 2014). When examining the outcomes and risks associated with particular disability categories, an important caveat is that disability categories do not represent homogeneous groups, but rather are comprised of students who often demonstrate diverse and complex needs. Furthermore, research suggests that many secondary age students experience significant symptoms of emotional and behavioral problems, yet may not be identified (Hetrick, Kern, & Dever, 2018). Therefore, further research is needed in order to determine the particular

academic and behavioral characteristics of students with disabilities that increase their vulnerability to maladaptive risky behaviors.

Peer influence. Although peer relationships provide an important context for social development, susceptibility to peer influence is a strong predictor of risk behavior, particularly during adolescence (Monahan, Steinberg, & Cauffman, 2009; Steinberg & Monahan, 2007). For instance, one of the strongest predictors of maladaptive and delinquent behavior in adolescence is affiliation with delinquent peers (Dishion, Bullock, & Granic, 2002). Further, peer influence and conformity to perceived peer norms have been linked to increased substance use and risky sexual behavior (Allen et al., 2006; French & Dishion, 2003; Prinstein & Wang, 2005).

Externalizing and internalizing behavior. A significant amount of research has explored the relationship between externalizing and internalizing behavior symptomatology and various types of risky behavior. Extensive work by Achenbach and colleagues has led to the widely accepted distinction between internalizing and externalizing expressions of adolescent dysfunction (e.g., Achenbach, 1990; McConaughy, Stanger, & Achenbach, 1992). These terms were first introduced in 1966 to describe factor-analytically derived groupings of problems found for clinically referred children (Achenbach, 1966; Achenbach, Ivanova, Rescorla, Turner, & Althoff, 2016). Currently, it is one of the most widely agreed upon classification systems of behavior disorders in psychopathology research (Cicchetti & Natsuaki, 2014).

Definition of externalizing behavior. Externalizing behavior problems are considered undercontrolled behaviors and manifest in children's outward actions toward the external environment (Achenbach & McConaughy, 1997). Examples include aggression, opposition/defiance, disruptive behavior, hyperactivity-impulsivity, and conduct problems. These types of behaviors are characteristic of disorders such as Oppositional Defiant Disorder

(ODD), Conduct Disorder (CD), and Attention-deficit/Hyperactivity Disorder (ADHD; American Psychological Association, 2013). Externalizing behaviors are often stable over time (Dowdy et al., 2014; Stemmler & Losel, 2012) and are predictive of violence, delinquency, substance use, and other negative outcomes during later adolescence and adulthood (Capaldi, Stoolmiller, Clark, & Owen, 2002; Copeland, Miller-Johnson, Keeler, Angold, & Costello, 2007; Fergusson, Horwood, & Ridder, 2007).

Externalizing problems and risky behavior. Empirical research has consistently linked externalizing problems to a variety of risky behaviors including early sexual behavior (Boislard & Poulin, 2011; Capaldi et al., 2002; Siebenbruner, Zimmer-Gembeck, & Egeland, 2007; Skinner et al., 2015), substance use (Armstrong & Costello, 2002; Costello et al., 2003; Fergusson et al., 2007) and behaviors that contribute to physical injury and violence (Rowe, Maughan, & Goodman, 2004; Rowe, Simonoff, & Silberg, 2007; Schwebel et al., 2011). In addition, children with externalizing behavior problems are more likely to engage in risky behavior earlier than their peers, which puts them at greater risk for harmful long-term effects due to their exposure to potentially harmful behaviors over a longer period of time (Kuperman et al., 2001; Lillehoj, Trudeau, Spoth, & Madon, 2005). For example, adolescents who engage in early sexual activity tend to accumulate more sexual partners over time (Rotermann, 2008) and are more likely to engage in unprotected sex (Kaestle, Halpern, Miller, & Ford, 2005; Magnussen, Masho, & Lapane, 2012; Siebenbruner et al. 2007), putting them at increased risk for contracting a sexually transmitted infection or unintended pregnancy. Indeed, a significant amount of longitudinal research shows that adolescents who demonstrate externalizing behavior in childhood are more likely to engage in risky behavior during adolescence, which subsequently leads to poorer health in adulthood, lower educational attainment, and less economic success

(Spriggs & Halpern, 2008; Steward, Farkas, Bingenheimer, 2009).

Definition of internalizing behavior. In contrast to externalizing behaviors, internalizing problems tend to be covert and represent an inner-directed pattern of behavior (Achenbach & McConaughy, 1997), occurring when individuals try to control internal emotions or cognitions to an excessive and maladaptive extent (Merrell & Gueldner, 2010). Examples of internalizing behaviors include anxiety, depression, social withdrawal, somatic complaints, and negative self-thoughts. Internalizing problems are associated with impairment in academic performance and social and family functioning (Garber & Weersing, 2010; Liu, Chen, & Lewis, 2011; Rapport, Denney, Chung, & Hustace, 2010). In fact, individuals with internalizing problems often have impaired problem-solving abilities, pessimistic cognitive styles, distorted perceptions, low self-efficacy, and poor coping skills (Greenberg, Domitrovich, & Bumbarger, 2001). Further, significant internalizing problems, similar to externalizing problems, may result in negative effects on adult relationships, employment, and physical health (Perle et al., 2013; Woodward & Fergusson, 2001).

Internalizing problems and risky behavior. Although a significant amount of research demonstrates a predictive relationship between externalizing symptoms and risky behavior, the relationship between internalizing symptoms and risk-taking during adolescence is not as clear. Some research suggests that adolescents with internalizing problems may be at heightened risk for injury, violence, early sexual onset, substance use, and suicide (Buckner et al., 2008; Ethier et al., 2006; Joffe, Van Lieshout, Duncan, & Boyle, 2014 Rowe et al., 2007; Rizzo et al., 2012, Skinner et al., 2015). However, these findings are inconsistent, as multiple studies have found no link between internalizing problems and various types of risky behavior (Caminis, Henrich, Ruchkin, Schwab-Stone, & Martin, 2007; Farmer et al., 2015; McLeod & Knight, 2010).

Researchers have contemplated the theoretical reasons for contradictory research findings. Some have suggested that adolescents with internalizing problems, such as depression, may engage in risky behavior as a means to cope with or relieve stress. Research examining the relationship between depression and risky behavior has indicated that negative affect and symptoms of depression are related to alcohol use, drug use, smoking, and risky sexual behavior (Boden, Fergusson, & Horwood, 2010; Hussong & Hicks, 2003; Hussong, Jones, Stein, Baucom, & Boeding, 2011; Schuster, Mermelstein, & Wakschlag, 2013). To explain this relationship, researchers have pointed to a theory of self-medication, which asserts that adolescents engage in risky behavior in order to cope with, or alleviate negative emotions (Boden et al., 2010; Hussong et al., 2011; Schuster et al., 2013). Alternatively, it has been posited that internalizing symptoms, especially anxiety, may delay or even protect adolescents from risky behavior (Rossi, Poulin, & Boislard, 2017; Lee, Wadsworth, & Hotopf, 2006). This theory suggests that adolescents who exhibit internalizing problems are often unable to form good peer relationships and are more likely to engage in isolating behaviors and social withdrawal, which in turn limits exposure to deviant peer groups and social events that promote risky behavior (Fanti & Henrich, 2010; Oland & Shaw, 2005).

Conflicting research findings may be attributed to the variety of ways that internalizing problems have been measured. Many studies have examined internalizing problems as a single construct, using one measure of overall internalizing symptoms. In contrast, numerous studies have analyzed the relationships between risky behavior and specific internalizing disorders or symptoms (e.g., anxiety, depression, social withdrawal, low self-esteem). The variety of different disorders and symptoms within the heterogeneous category of internalizing problems may be associated with risky behavior in different ways. For example, Kaplow, Curran, Angold,

and Costello (2001) demonstrated that children with symptoms of generalized anxiety were found to be at increased risk for initiation of alcohol use during adolescence, whereas children with symptoms of separation anxiety were at decreased risk. An additional issue with this research is that numerous studies have failed to consider students with comorbid disorders or to control for confounding externalizing psychopathology in their analyses (Farmer et al., 2015). Further research is needed to fully understand the relationship between internalizing symptoms and risky behavior.

Risky behaviors associated with comorbid externalizing and internalizing problems. Comorbidity, or the coexistence of two or more distinct disorders in the same individual at the same point in time (Achenbach, 1990), has received an increased amount of attention (Cunningham & Ollendick, 2010; Faire & Ollendick, 2013; Wolff & Ollendick, 2006). Although often treated separately, research has demonstrated relatively strong associations between externalizing and internalizing problems (Angold, Costello, & Erkanli, 1999; Wolff & Ollendick, 2006), with comorbid internalizing and externalizing disorders appearing relatively frequently in children, adolescents, and adults (Oland & Shaw, 2005). Further, research suggests that when internalizing problems remain untreated throughout childhood, there is an increased likelihood that severe pathology, or comorbid internalizing and externalizing symptomatology, will present as the child ages (Fanti & Henrich, 2010). Some researchers have suggested that youth with comorbid internalizing and conduct problems may display increased levels of symptomatology, impairment, and adjustment problems, and are more likely to be negatively influenced by deviant peers. Subsequently, these outcomes may lead to increased risk-taking (Hoeve et al., 2013, Fanti & Henrich, 2010).

The study of comorbid internalizing and externalizing problems is of particular importance because there is emerging evidence that comorbid internalizing disorders, particularly anxiety, may serve as either a risk factor or a protective factor for risk-taking behavior. According to Boislard, Dussault, Brendgen, and Vitaro (2013), it has been hypothesized that internalizing behaviors may not have a main effect, but rather play a moderating role between externalizing problems and risky behavior. Research has supported this hypothesis, demonstrating that anxiety and shyness mitigate the association between externalizing behavior and future delinquency (Kerr, Tremblay, Pagani, & Vitaro, 1997; Vitaro & Brendgen, 2011). Further, youth with high levels of internalizing behaviors, such as withdrawal, often experience impairment in social relationships (Vitaro & Brendgen, 2011). Therefore, it has been posited that internalizing behaviors might decrease risk behaviors by impeding friendship formation with deviant peers (Boivin & Vitaro, 1995; Dishion & Patterson, 1991). In addition, several longitudinal studies suggest that anxiety reduces the severity and course of externalizing conduct problems, thereby reducing the likelihood of maladaptive risky behavior (Mason et al., 2004; Pine, Cohen, Cohen, & Brooke, 2000).

Overall, it is unclear under what circumstances internalizing symptoms serve as a risk factor or a protective factor for risky behavior in youth with comorbid externalizing problems (Cunningham & Ollendick, 2010). A likely reason for the lack of clarity is that most studies fail to analyze and compare the various dimensions of anxiety and depression (e.g., harm avoidance, social anxiety, separation anxiety, negative affect, somatic complaints), which may relate to risky behavior in different ways. Further research is necessary in order to determine how the severity of comorbid symptoms may predict maladaptive risky behavior compared to students with internalizing or externalizing problems alone.

Factors that Protect Adolescents from Risky Behavior

Research has identified a number of protective factors that may explain why some adolescents are less likely to engage in maladaptive risky behaviors than others. These protective factors such as school engagement (Chapman, Buckley, Sheehan, Shochet, & Romaniuk, 2011; Chapman, Buckley, Sheehan, & Shochet, 2013; Rudasill et al., 2010), academic achievement (Bradley & Greene, 2013; Busch et al., 2014; Michael, Merlo, Basch, Wentzel, & Wechsler, 2015; Rai et al., 2003; Rasberry et al., 2017), and positive parenting practices and engagement (Barnes, Hoffman, Welte, Farrell, & Dintcheff, 2006; DiClemente et al., 2001; Markham et al., 2010; Mumford, Liu, & Taylor, 2016; Resnick et al., 1997) are likely to promote adaptive behavior and increase adolescents' ability to avoid dangerous risky behavior.

School engagement. Research has shown that school engagement leads to a variety of favorable outcomes, such as emotional well-being, academic achievement, reduced risky behaviors, and reduced rates of dropout (Chapman et al., 2011; Chapman et al., 2013; Wang & Eccles, 2012a, 2012b). Evidence suggests that students who feel connected to school through positive relationships with teachers are more likely to behave prosocially and responsibly and, therefore, are less likely to engage in maladaptive, risky behavior (Chapman et al., 2013; Rudasill et al., 2011). For example, research indicates that children and adolescents who feel connected to their schools are less likely to engage in early sexual activity, alcohol use, tobacco use, drug use, violence and gang involvement (Bond et al., 2007; Chapman et al., 2011; Chapman et al., 2013; McNeely, Nonnemaker, & Blum, 2002; Resnick et al., 1997; Wormington, Anderson, Schneider, Tomlinson, & Brown, 2016). Research has also demonstrated a strong relationship between school engagement and educational outcomes,

including school attendance, staying in school longer, and higher grades and classroom test scores (Battin-Pearson et al., 2000; Wang & Eccles, 2012a; Wentzel, Battle, Russell, & Looney, 2010).

Academic achievement. Academic success and achievement may reduce students' likelihood to engage in maladaptive risky behavior (Basch, 2011; Bradley & Greene, 2013; Demmler et al., 2017; Rasberry et al., 2017). Numerous research studies demonstrate a strong connection between academic achievement and health-related behaviors (Bradley & Greene, 2013; Busch et al., 2014; Demmler et al., 2017; Michael et al., 2015; Rasberry et al., 2017). In fact, low educational performance (e.g., poor grades and test scores, lower educational attainment) has been consistently linked to all six of the priority health-risk behaviors identified by the CDC (Bradley & Greene, 2013; Rasberry et al., 2017). Furthermore, longitudinal studies indicate that less engagement in risky behavior during adolescence leads to higher achievement later in life, and that earlier academic achievement leads to less health-risk behaviors later in life. Although a direct causal link has yet to be established, causal relationships are believed to exist in both directions between education and health (Basch, 2011; Bradley & Greene, 2013; Rasberry et al., 2017). Therefore, academic performance is commonly viewed as an important indicator of overall health and well-being during adolescence, and as a primary determinant of adult health outcomes (Michael et al., 2015).

Positive parenting practices and engagement. Parents and families play an important role in shaping the health of adolescents. Research suggests that parents can help deter adolescent risky behavior by using more positive practices, effectively monitoring their teenager, and engaging with the school. Studies show exposure to harsh parenting may increase the likelihood of that an adolescent will decide to engage in risky behavior (Alati et al., 2014;

Conger, Ge, Elder, Lorenz, & Simons, 1994; Guilamo-Ramos et al., 2012), whereas positive and supportive parenting is likely to decrease adolescent involvement in risky behavior (Mumford et al., 2016; Parkes, Henderson, Wight, & Nixon, 2011; Resnick et al., 1997). For instance, teenagers whose parents use positive support and effective monitoring practices are less likely to make poor decisions, such as having sex at an early age, smoking cigarettes, drinking alcohol, being physically aggressive, or skipping school (Barnes et al., 2006; DiClemente et al., 2001; Li, Feigelman, & Stanton, 2000; Markham et al., 2010; Rai et al., 2003; Resnick et al., 1997; Sneed, Strachman, Nguyen, & Morisky, 2009). Further, when parents are engaged in their children's school activities, their children get better grades, have better social skills, and are more likely to choose healthier behaviors (Resnick et al., 1997).

Summary and Limitations of the Current Literature

Research clearly demonstrates that adolescent risk-taking can result in serious consequences throughout the life course. Therefore, a large body of research has examined the risk factors and protective factors associated with maladaptive risky behavior. Research demonstrates that certain demographic characteristics (i.e., gender, SES, disability), influence of deviant peers, and demonstration of emotional and behavioral problems, particularly externalizing behaviors, are significantly associated with of adolescent risk-taking.

The documented poor outcomes that students with internalizing and externalizing problems have consistently faced, and the propensity for engaging in risk-taking behaviors, highlight the need for a greater understanding of the relationship between their complex emotional and behavioral needs and maladaptive risky behavior. Although there has been considerable investigation of various factors that contribute to risky behavior among adolescents in the United States, there are several areas of limitation within the current research base.

First, findings regarding the effects of internalizing problems on risky behavior during adolescence are contradictory. Considerable disagreement remains on whether students with high levels of internalizing problems are more likely to engage in risky behaviors to cope with stressors, or if symptoms of fear, anxiety and social withdrawal prevent risky behaviors from occurring. Due to the heterogeneity of internalizing problems, research examining the relationship between risky behavior and specific symptoms of anxiety and depression is needed. In addition, the prevalence of students with complex presentations of co-occurring needs may be a significant factor in the conflicting research, as numerous studies have failed to control for confounding externalizing symptoms in their analyses. Further research is needed to fully understand the relationship between internalizing symptoms and risky behavior.

Second, research findings regarding the effects of comorbid internalizing and externalizing problems are limited and inconsistent. Few studies have directly compared risk-taking behavior among groups of students with externalizing, internalizing, and comorbid externalizing and internalizing problems. Further research is necessary in order to determine how the severity of comorbid symptoms may predict maladaptive risky behavior compared to students with internalizing or externalizing problems alone. Additionally, it is unclear which specific symptoms of depression and anxiety serve as risk factors or protective factors for risky behavior in youth with comorbid externalizing problems.

Finally, although previous research has identified protective factors that may reduce the likelihood of risky behavior among adolescents (e.g., academic achievement, school engagement, and positive parenting), it is unknown whether the impact of those factors is consistent among adolescents with different types of behavior problems. To date, no existing research studies have examined academic achievement, school engagement, or positive parenting

practices as potential moderators between types of behavioral symptoms (i.e., externalizing, internalizing, comorbid externalizing and internalizing) and risky behavior. Thus, it is unclear whether various protective factors impact students with externalizing, internalizing, and comorbid behavioral symptoms similarly. Additional research in this area is necessary in order to understand risk and protective factors for students with different behavioral profiles. Overall, research is limited in identifying the specific types of behavior problems that are associated with risky behavior among secondary students with disabilities, particularly those with or at risk for emotional behavioral disorders (EBD).

Purpose of the Current Study

The purpose of this study was to investigate the relationships between maladaptive risky behavior and internalizing, externalizing, and comorbid behavioral symptoms among a population of secondary students with or at-risk for EBD.

Specific Research Questions and Hypotheses

Research question 1. Do high school students with emotional and behavioral problems differ in their reports of risky behavior (i.e., smoking/tobacco use, alcohol use, marijuana use, sexual behaviors, and suicidal behavior) depending on their behavioral symptoms (i.e., high externalizing, high internalizing, or high externalizing and internalizing)? If so, are those differences consistent across genders?

It was hypothesized that differences would be found between groups when comparing secondary students with externalizing problems only and internalizing problems only to those with co-occurring internalizing and externalizing problems. Because of their complex behavioral pathology (Fanti & Henrich, 2010), it was hypothesized that adolescents with comorbid externalizing and internalizing problems would report the highest levels of engagement in risky

behavior. It was also hypothesized that group differences would be consistent across males and females. In accordance with previous research findings regarding gender differences in risky behavior (Byrnes et al., 1999; Kann et al., 2016), it was predicted that males would report higher rates of tobacco use, alcohol use, marijuana use, and sexual behaviors, whereas female students would report higher rates of suicidal behavior.

Research question 2. Is the relationship between behavioral symptoms (high externalizing, high internalizing, and high externalizing and internalizing) and risky behavior (i.e., smoking/tobacco use, alcohol use, marijuana use, sexual behaviors, and suicidal behavior) moderated by levels of academic functioning, school engagement, or positive parenting among high school students identified as having emotional and behavioral problems? Are those relationships consistent across genders?

In accordance with previous research identifying academic achievement, school engagement, and positive parenting as protective factors (e.g., Chapman et al., 2013; Michael et al., 2015; Resnick et al., 1997), it was hypothesized that high levels of these factors would be associated with lower levels of each type of risky behavior (i.e., smoking/tobacco use, alcohol use, marijuana use, sexual behaviors, and suicidal behavior). This protective relationship was expected to be consistent across students with high levels of externalizing, high levels of internalizing, and high levels of comorbid internalizing and externalizing symptoms. The impact of academic achievement, school engagement, and positive parenting on risky behavior was also expected to be consistent across males and females.

Research question 3. Among high school students identified as having an emotional or behavioral problem, is the relationship between externalizing problems and risky behavior (i.e., smoking/tobacco use, alcohol use, marijuana use, sexual behaviors, and suicidal behavior)

moderated by symptoms of anxiety (i.e., physical symptoms, harm avoidance, separation anxiety/panic, and social anxiety)? Are the relationships between externalizing problems, anxiety symptoms, and risky behavior consistent across genders?

Considering the theory that internalizing problems may result in fear of injury, social withdrawal, and inaccessibility to deviant peer groups (Fanti & Henrich, 2010; Oland & Shaw, 2005), it was hypothesized that symptoms of harm avoidance and social anxiety would moderate the relationship between externalizing problems and risky behavior, resulting in reduced levels of risky behavior among adolescents with co-occurring externalizing symptoms. It was also hypothesized that the moderating effect of those anxiety symptoms would be consistent across genders.

Research question 4. Among high school students identified as having an emotional or behavioral problem, is the relationship between externalizing problems and risky behavior (i.e., smoking/tobacco use, alcohol use, marijuana use, sexual behaviors, and suicidal behavior) moderated by symptoms of depression (i.e., dysphoric mood, negative affect, negative self-evaluation, and somatic complaints)? Are the relationships between externalizing problems, depression symptoms, and risky behavior consistent across genders?

In line with the self-medication theory that adolescents may engage in risky behavior as a means of alleviating negative emotions (Hussong & Hicks, 2003; Hussong et al., 2011; Schuster et al., 2013) and the research indicating that adolescents with complex comorbid problems engage in more maladaptive behavior (Fanti & Henrich, 2010), it was hypothesized that symptoms of depression (i.e., dysphoric mood, negative affect, negative self-evaluation, and somatic complaints) would moderate the relationship between externalizing symptoms and risky behavior, resulting in increased levels of risky behavior among adolescents with co-occurring

externalizing symptoms. It was also hypothesized that the moderating effect of those depressive symptoms would be consistent across genders.

Chapter 2

Review of the Literature

Throughout life, decisions can range from those that are routine to those that could be a matter of life or death. Risk-taking is defined as engaging in behaviors that are associated with some probability of undesirable results (Boyer, 2006) and risky behavior is influenced by a variety of social, emotional, and cognitive factors. It is largely acknowledged that many types of risk-taking behaviors emerge, increase, and eventually peak in adolescence (Arnett, 1992; Jessor, 1991). It is also recognized that child and adolescent risk-taking have the potential for significant consequences. Although risk-taking can be an adaptive way for youth to test boundaries as they approach adulthood, risk-taking can be maladaptive and result in consequences when an activity's risks outweigh potential benefits (Rudasill, Reio, Stipanovic, & Taylor, 2010). Understanding the factors associated with adolescent risk-taking is an important step in preventing the maladaptive behaviors that can lead to social, emotional, or physical impairment in adulthood.

Risk-Taking During Adolescence

Adolescence is an important developmental period and a time that is characterized by exploration, experimentation, and increased risk-taking (Gardner & Steinberg, 2005; Steinberg, 2008). This transitional period between childhood and adulthood is a time when young people develop social and intellectual skills that will prepare them for the responsibilities of adulthood (Harris, Duncan, Boisjoly, 2002). Further, adolescence is a time of making choices about various aspects of life such as health, family, career, social relationships, and education. Taking risks is common during adolescence and can be an adaptive way for youth to test their strengths, limitations, and the boundaries of societal norms as they prepare for adulthood (Rudasill, et al.,

2010). Conversely, adolescent behavior can be maladaptive when an activity's risks outweigh any potential benefits (Rudasill et al., 2010). Thus, this developmental period provides opportunities for adolescents to adopt healthy lifestyles or to engage in behaviors that have serious implications for health risks (Harris et al., 2002).

Several decades of research confirm that adolescence is a period fraught with inordinate risk-taking (Kann et al., 2016). For example, adolescents and young adults ages 18 to 21 are more likely than adults over 25 to binge drink, smoke cigarettes, have casual sex partners, engage in violent and other criminal behavior, and have fatal or serious automobile accidents, the majority of which are caused by risky driving or driving under the influence of alcohol (Steinberg, 2008). In addition, adolescent risk-taking behaviors tend to co-occur and engagement in a single risk behavior can predict other risk-taking behaviors (Jessor, 1991). This co-occurrence has been repeatedly supported in the literature in studies associating alcohol use, drug use, sexual behaviors, delinquency, violence, and injury (Dishion, Veronneau, & Myers, 2010; Feldstein & Miller, 2006; Schofield, Bierman, Heinrichs, & Nix, 2008). Further, adolescents who initiate maladaptive risky behavior in early adolescence (i.e., ages 11–14; Thompson et al., 2011) as compared to those who are involved in such behavior in later adolescence, are at greater risk of developing poorer health in adulthood, lower educational attainment, and less economic success (Spriggs & Halpern, 2008; Steward, Farkas, & Bingenheimer, 2009).

Adolescent risk-taking can have serious economic, psychological, and health implications (Reyna & Farley, 2006). The habits that emerge during this period can last a lifetime, as many forms of risky behavior initiated in adolescence elevate the risk for the behavior in adulthood (Eaton et al., 2012). For instance, behaviors that began as voluntary choices to experiment

during adolescence, such as tobacco or substance use, can be perpetuated by addiction (Slovic, 2000). Prevention at the time when use is still a matter of deliberate choice is more successful and less costly than treating alcohol or drug addiction during adulthood (Reyna & Farley, 2006). Further, delaying the initiation of certain behaviors (e.g., alcohol and substance use, early sexual activity) until later in adolescence would allow for cognitive and emotional development, which could reduce unhealthy risk taking as adolescents mature (Crone, van Duijvenvoorde, & Peper, 2016; Reyna & Farley, 2006; Steinberg, 2005; Steinberg, 2008). Thus, public health experts agree that reducing the rate of risky behaviors among adolescents could have a broad impact on society, reducing the burdens of disease, injury, and associated economic costs (Reyna & Farley, 2006).

Priority risk behaviors. According to the most recent national data available from the Centers for Disease Control and Prevention (CDC; Heron, 2017), 72% of all deaths among persons aged 10 to 24 years resulted from three causes in 2015: unintentional injuries (39.6%), suicide (17.6%), and homicide (14.6%). In addition, among teenagers aged 15 to 19 years, each year an average of 273,105 give birth; 451,208 are diagnosed with cases of chlamydia, gonorrhea, and syphilis; and 1,828 receive diagnoses of human immunodeficiency virus (HIV). These leading causes of mortality, morbidity, and social problems among youth and young adults in the United States are related to six categories of priority health risk behaviors identified by the CDC: (a) behaviors that contribute to unintentional injuries and violence, (b) sexual behaviors that contribute to unintended pregnancy and sexually transmitted infections, (c) alcohol and drug use, (d) tobacco use, (e) unhealthy dietary behaviors, and (f) inadequate physical activity. Although these targeted risk behaviors are frequently interrelated and often extend into adulthood, they are preventable (Eaton et al., 2012). Therefore, the CDC developed the Youth

Risk Behavior Surveillance System (YRBSS) to gather data on health-risk behaviors among Americans, and to utilize those data to inform public policy and practice (Brener et al., 2013).

Youth Risk Behavior Surveillance System (YRBSS). Developed by the CDC in 1990, the YRBSS uses a national school-based survey to monitor the six categories of priority health risk behaviors among youth and young adults. The Youth Risk Behavior Survey (YRBS) is used to glean population-based data on health-risk behaviors at the national, state, and local levels. These data are used to monitor the effectiveness of public health interventions, examine the co-occurrence of risk behaviors, and compare the prevalence of health behaviors among subpopulations of students. Additionally, YRBS data allow for the development and evaluation of school and community policies, programs, and practices that are designed to decrease health-risk behaviors and improve outcomes among youth.

For the 2015 national YRBS, 15,624 ninth through twelfth grade students from 125 public and private high schools completed questionnaires. Results indicated that many high school students engage in the priority health-risk behaviors associated with the leading causes of death among young people in the United States (Kann et al., 2016). Notably, 32.8% of respondents reported that they drank alcohol and 21.7% used marijuana in the 30 days before completing the survey. Results also revealed that many high school students report engaging in sexual behavior that puts them at increased risk for unintended pregnancy and sexually transmitted infections, including HIV. In fact, of the 41.2% of secondary students nationwide who reported ever having sexual intercourse, 30.1% reported being currently sexually active and 11.5% reported having four or more sexual partners in their lifetime. Alarmingly, only 56.9% of sexually active students reported using a condom during their last sexual experience (Kann et al., 2016). Overall, recent national survey results clearly demonstrate that many adolescents engage

in behaviors that place them at risk for the leading causes of morbidity and mortality. However, empirical data indicate that the likelihood of engaging in specific behaviors varies depending on a number individual, social, and environmental factors.

Factors that are Associated with Risky Behavior

Existing research points to an array of factors that are associated with increases in an adolescent's likelihood of engaging in maladaptive risky behavior. These factors include certain demographic characteristics (i.e., gender, socioeconomic status, disability status), peer influence, and demonstration of externalizing or internalizing behavior problems.

Demographic characteristics. Research demonstrates that demographic characteristics of gender (Agrawal & Lynskey, 2007; Byrnes, Miller, & Schafer, 1999; Halpern et al., 2004), socioeconomic status (Crandall, Magnusson, Novilla, Novilla, & Dyer, 2017; Edwards, Mumford, Shillingford, & Serra-Roldan, 2007; Harris et al., 2002; Ponnett, 2014) and disability status (Blum, Kelly, & Ireland, 2001; McNamara & Willoughby, 2010; Raman, Boyce, & Pickett, 2009; Sarver, McCart, Sheidow, & Letourneau, 2014) are associated with increased risk-taking during adolescence.

Gender. Gender differences in risk-taking are well-documented. A meta-analysis of 150 studies (Byrnes et al., 1999) found that males take more risks than females do in the vast majority of tasks. In particular, results demonstrated that males reported higher levels of engagement in substance use, risky driving behaviors, smoking, and sexual activity when compared to females. However, gender differences varied depending on the type of behavior and age level. Self-reported risky behaviors related to driving were associated with significant gender differences during adolescence (ages 14 to 17) that increased over time and into adulthood (ages 22 and older). In contrast, risky sexual behavior was associated with significant

gender differences in early adolescence (ages 10 to 13) that extended into adulthood, but the gender differences narrowed over time. In terms of alcohol and drug use, significant gender differences emerged during young adulthood (ages 18 to 21), when many individuals transition from high school to college, and remained consistent into adulthood. However, smoking and tobacco use behaviors were associated with considerably smaller gender differences at most ages. The authors posited that fluctuations in gender differences between early adolescence and adulthood may be due to periodic changes in biological maturation, self-perception, parental and peer influences, personal values, and perception of risk. These factors, which may independently or collectively influence males and females in different ways at different times, are yet to be fully understood. Consistent with the findings of Byrnes et al. (1999), several studies of gender differences in substance use and delinquency have demonstrated that significant differences often begin to emerge during late adolescence and early adulthood, with males tending to engage in these behaviors more frequently or at a higher rate than females (Agrawal & Lynskey, 2007; Kandel & Chen, 2000; Perkonigg et al., 2008). However, specific reasons for these gender differences have been largely unexplored.

Recent data from the 2015 national YRBS indicated that male and female high school students report different types of risk behavior (Kann et al., 2016). Prevalence estimates and confidence intervals were computed for all variables and *t*-tests were used to determine pairwise differences between males and females. Male students reported significantly higher engagement in the following risk behaviors compared to their female peers: injury-related behaviors (e.g., rarely or never wearing a seatbelt, driving when drinking alcohol), violence-related behaviors (e.g., carrying a weapon, being in a physical fight, being injured in a physical fight), tobacco use (e.g., smoking a whole cigarette before age 13; current cigarette, cigar, smokeless tobacco, and

electronic vapor product use), and alcohol and other drug use (e.g., drinking alcohol before age 13; having 10 or more drinks of alcohol in a row; trying marijuana before age 13 years; current marijuana use; ever using synthetic marijuana, hallucinogenic drugs, cocaine, ecstasy, heroin, methamphetamines). In contrast, female students reported significantly higher engagement in behaviors related to victimization (e.g., having not gone to school because of safety concerns, being electronically bullied, being bullied on school property, being forced to have sexual intercourse, physical dating violence, and sexual dating violence). In addition, female students reported a higher prevalence of all five suicide-related behaviors (i.e., feeling sad or hopeless, seriously considering attempting suicide, having made a suicide plan, attempting suicide, and having made a suicide attempt resulting in an injury, poisoning, or overdose that had to be treated by a doctor or nurse).

Socioeconomic status. It is widely acknowledged that poverty and low socioeconomic status puts children and adolescents at risk for a plethora of negative short- and long-term outcomes. For instance, youth from low-income families experience higher rates of poor physical and mental health and are more likely to engage in early and unprotected sexual intercourse, experience adolescent pregnancy, be arrested, and drop out of school (Edwards et al., 2007; Harris et al., 2002; Harris & Marmer, 1996). According to Ponnet (2014), engaging in risky behaviors is a maladaptive coping mechanism that some adolescents may adopt in the face of poverty or other family stressors.

During the past two decades, a large body of research has also examined family-based pathways through which financial stress is associated with negative child and adolescent outcomes (Barnett, 2008; Gershoff, Aber, Raver, & Lennon, 2007; Crandall et al., 2017; Lee, Lee, & August, 2011; Mistry, Lowe, Benner, & Chien, 2008; Ponnet, 2014; Ponnet, Van

Leeuwen, Wouters, & Mortelmans, 2015). Studies have demonstrated that financial stress is associated with fewer positive parenting behaviors (Kiernan & Huerta, 2008; Lee, Anderson, Horowitz, & August, 2009), which are associated with negative child and adolescent outcomes, such as externalizing problem behavior (Linver, Brooks-Gunn, & Kohen, 2002; McConnell, Breitkreuz, & Savage, 2011; Shelleby et al., 2014). Notably, Ponnet et al. (2015) investigated a sample of 340 two-parent families who had a child in secondary school. Both parents completed ratings of financial stress, parenting stress, parent-child communication and externalizing problem behavior. Results revealed that family financial stress was associated with aggressive and delinquent adolescent behaviors, mediated by level of parent stress and quality of the parent–child communication.

Similarly, in a 4-year longitudinal study of 450 adolescents (ages 13 to 16 at baseline) and their parents, Crandall et al. (2017) found that high levels of family financial stress in early-to-mid adolescence indirectly predicted adolescent report of risky sexual behaviors in later adolescence among both males and females. Structural equation models indicated that high family financial stress predicted engagement in risky sexual behaviors (i.e., number of sexual partners, untrustworthy partners, having sex with a stranger, relationship commitment, and discussing sexual histories before having sex) as mediated by adolescent self-regulation. The authors concluded that financial stress appeared to impair adolescent self-regulation, which resulted in an impaired ability to regulate thoughts, emotions, and behaviors, ultimately leading to increased sexual risk-taking.

***Disability status*.** Evidence suggests that adolescents who have been identified with a disability are more likely to engage in risky behaviors than their non-disabled peers (Blum et al., 2001). In fact, there is a growing body of research that suggests that the differences in physical,

psychological, and social development associated with having a disability may increase the likelihood that these adolescents engage in risk behaviors such as smoking (Kalyva, 2007; Lawrence, Mitrou, Sawyer, & Zubrick, 2010), alcohol and drug use (Blum et al., 2001; McNamara & Willoughby, 2010), risky sexual behavior (Sarver et al., 2014; Valois, Bryant, Rivard, & Hinkle, 1997) and behaviors that lead to injury (Raman et al., 2009).

Using data from the National Longitudinal Study of Adolescent to Adult Health (Add Health; Resnick et al., 1997), Blum, Kelly, and Ireland (2001) examined the health-risk involvement and negative outcomes of adolescents with disabilities (e.g., mobility impairments, learning disabilities, and emotional disabilities) compared to their peers without disabilities. Participants included a nationally representative sample of 20,780 students in grades 7 through 12 who participated in an in-home interview regarding overall health and wellbeing across school and family contexts. Blum and colleagues examined five negative health outcomes: suicide attempts, sexual abuse, regular cigarette smoking, alcohol use, and marijuana use. Overall, results indicated that youth with disabilities were found to be significantly more involved in risky behavior than nondisabled peers. Of particular interest is that students in the emotional disabilities group, defined as those who reported chronic emotional problems and scored in the upper quintile of the emotional distress scale of the Add Health interview, were significantly more likely to report suicide attempts, regular smoking, regular alcohol use, use of marijuana, and early sexual behavior before the age of 12. Results also revealed that students with disabilities reported significantly more exposure to risk factors (e.g. somatic complaints, violence victimization, emotional distress, low family SES, and history of family suicide) and significantly less access to protective factors (e.g., family connectedness, parental presence, school connectedness, grade point average) than students with no documented disability.

Unfortunately, the research examining risky behavior among students with disabilities fails to identify the specific cognitive, behavioral, and social factors associated with disability that increase the likelihood of maladaptive risky behavior. Adolescents with disabilities, especially those with emotional and behavioral needs, are a heterogeneous group who often demonstrate diverse and complex needs (e.g., externalizing vs. internalizing problems). Therefore, further research is needed in order to understand the particular characteristics of students with disabilities that increase their vulnerability to maladaptive risky behaviors.

Peer influence. Susceptibility to peer influence is a strong predictor of risky behavior and individuals are most vulnerable to its effects during adolescence (Monahan, Steinberg, & Cauffman, 2009; Steinberg & Monahan, 2007). Although peer relationships provide an important context for social development, conformity to negative peer norms appears as a major risk factor linked to negative outcomes such as delinquency, substance abuse, and risky sexual behavior (Allen, Porter, & McFarland, 2006; DiIorio et al., 2001; Andrews, Tildesley, Hops, & Li, 2002; French & Dishion, 2003; Metzler, Noell, Biglan, Ary, & Smolkowski, 1994; Prinstein, Boergers, & Spirito, 2001; Prinstein, Brechwald, & Cohen, 2011). Peers can influence adolescents to engage in prosocial behavior as well (van Hoorn, van Dijk, Meuwese, Rieffe, & Crone, 2016), but affiliation with delinquent peers remains one of the strongest predictors of maladaptive behavior during adolescence (Dishion, Bullock, & Granic, 2002).

Adolescents tend to take greater risks in the presence of peers than when alone, a phenomenon that is not observed during adulthood (Gardner & Steinberg, 2005). Peer influence may also affect adolescents' risk-taking behavior by changing how adolescents perceive risk, as research finds that adolescents view situations as less risky if peers rate them as less risky (Knoll, Magis-Weinberg, Speekenbrink, & Blakemore, 2015). For example, Gardner and Steinberg

(2005) examined the effects of peer influence on the risk-taking behavior of 306 participants in three age groups: adolescents (ages 13 to 16), young adults (ages 18-22), and adults (ages 24 and older). All participants completed two questionnaires that assessed risk preference and risky decision making, and one behavioral task measuring risk-taking. The behavioral task was a video game that required participants to make decisions about whether to stop a car that is moving across the screen once a traffic light turned from green to yellow. This task required participants to make actual decisions in the moment, rather than just reporting what they would do in a hypothetical risky situation. Participants in each age group were randomly assigned to complete the questionnaire and behavioral task measures either alone or with two same-aged peers. This study found that participants who completed the measures with peers took more risks, focused more on the benefits than the costs of risky behavior, and made riskier decisions than those who completed the same tasks alone. These findings were particularly strong for adolescent and young adult participants as compared to adults (Gardner & Steinberg, 2005).

In a more recent study, Widman, Choukas-Bradley, Helms, and Prinstein (2016) examined predictors of susceptibility to peer influence related to sexual risk-taking. Participants were 300 seventh-grade students from rural, low-income middle schools in the southeastern United States. First, students completed a pretest survey of demographics, sexual attitudes, and hypothetical scenarios measuring the likelihood of engaging in risky sexual behavior. Next, students participated in an experimental procedure that simulated an internet chat room. In this condition, students discussed the same hypothetical scenarios with other users who they believed to be peers. Susceptibility to peer influence was measured by changes in responses to the hypothetical scenarios during the private pretest versus the chat room simulation. Results indicated a significant effect of peer influence, with 78% of adolescents providing riskier

responses during the peer influence condition (i.e., chat room) than during the private assessment. In addition, the strongest predictor of susceptibility to peer influence was gender, with boys significantly more likely to provide risky responses when influenced by peers.

Externalizing symptoms. Externalizing behaviors, which include disruption, aggression, and defiance, have been linked to poor behavioral control and increased risk-taking. Research demonstrates that externalizing behaviors are stable over time (Dowdy et al., 2014; Stemmler & Lösel, 2012) and are predictive of negative outcomes during later adolescence and adulthood. In fact, there is substantial longitudinal evidence that conduct problems exhibited at school entry predict elevated risk for antisocial and maladaptive behavior later in adolescence (Fergusson, Horwood, & Ridder, 2005). Therefore, a significant amount of empirical research has explored the relationship between externalizing behavioral symptoms and several of the priority health risk behaviors identified by the CDC (i.e., behaviors that contribute to unintentional injuries and violence, sexual behaviors that contribute to unintended pregnancy and sexually transmitted infections, alcohol and drug use).

Behaviors that contribute to unintentional injury. Unintentional injuries are the leading cause of death for children and adolescents in the United States (Heron, 2017). Additionally, non-fatal injuries are a source of considerable morbidity as they may lead to longstanding disabilities (Jokela, Power, & Kivimaki, 2009). In the United States in 2015, almost 25,000 children less than 20 years of age visited an emergency department because of an injury every day (CDC, 2017).

Several studies on externalizing problems (e.g., conduct disorders, impulsivity, antisocial behavior) suggest that such behaviors increase the risk of injury among adolescents (Jokela et al., 2009; Rowe, Maughan, & Goodman, 2004; Rowe, Simonoff, & Silberg, 2007; Schwebel, 2004).

For example, Jokela et al. (2009) used data from the British National Child Development Study (N = 11,537) to examine whether teacher-assessed externalizing and internalizing behaviors at the ages of 7 and 11 predicted injuries throughout adolescence and adulthood. Injuries were reported by the participants' parents (at ages 7, 11, and 16) and by the participants (at ages 23, 33, 42, and 46). Results revealed that teacher-assessed externalizing behavior in childhood was a significant predictor of increased injury risk. Specifically, an increase of one standard deviation in the externalizing score on the Bristol Social Adjustment Guide (BSAG; Stott, 1963) was associated with a 10–19% increase in the rate of injuries in childhood, adolescence, and adulthood. This risk was considerably stable from childhood through adolescence and extended into adulthood. Results also indicated that externalizing behavior was significantly associated with injuries incurred while at work, at home, while driving, and from violent assaults. Furthermore, children with high externalizing scores were significantly more likely to be permanently disabled in accidents than children with low externalizing scores, even when their increased rate of injuries was taken into account, suggesting that externalizing behavior was also related to more severe injuries. These findings are consistent with previous research, such as that by Rowe and colleagues (2004, 2007) that demonstrated an association between disruptive behavior problems and unintentional injury.

Behaviors that contribute to violence. Violence, particularly among adolescents, has been recognized as a significant public health problem (Valois, Zullig, & Revels, 2017). Aggressive behaviors such as physical fighting, weapon carrying and being threatened have become common within many of the nation's schools (Kann et al., 2016; Valois, McKeown, Garrison, & Vincent, 1995; Lowry, Powell, Kann, Collins, & Kolbe, 1998).

In regard to externalizing behavior problems and violence, several studies have demonstrated that early delinquent and violent behaviors are indicative of persistent behavioral patterns that continue through adolescence and into adulthood (Huesmann, Eron, & Dubow, 2002; Thompson et al., 2011). For instance, Thompson and colleagues (2011) measured externalizing behavioral symptoms using the Childhood Behavior Checklist (CBCL; Achenbach, 1991) at ages 4, 6, 8, and 10. At age 12, participants were interviewed about their risky behaviors related to substance use, violence, and delinquency. Results from this longitudinal analysis of 875 children demonstrated that externalizing behavior problems present before the age of 12 significantly predicted violent/delinquent behavior and substance use in early adolescence. These findings provide evidence of the continuity between childhood externalizing problems and risky behavior in early adolescence.

Compared with those who become involved in delinquent behavior in later adolescence, those who engage early in delinquent or violent behavior are at greater risk of becoming serious, violent, and chronic offenders (National Criminal Justice Reference Service, 2003; Thompson et al., 2011). Research also has demonstrated that the predictive relationship between externalizing behavior in childhood and later violent and aggressive behavior is particularly strong for boys (Broidy et al., 2003; Huesmann et al., 2002). For example, Broidy and colleagues (2003) investigated the developmental course of physical aggression in childhood and its relationship to violent and nonviolent offending outcomes during adolescence. The authors examined longitudinal data from six sites in three countries (i.e., Montreal, Canada [n = 1,161]; Quebec, Canada [n = 2,000]; Christchurch Health and Development Study, New Zealand [n = 1,265]; Dunedin Multidisciplinary Health and Development Study, New Zealand [n = 1,037]; Pittsburgh Youth Study, United States [n = 1,517]; Child Development Project, United States [n = 585]).

For each site, parents and teachers reported on aspects of disruptive behavior (i.e., physical aggression, opposition, hyperactivity, and conduct problems) and outcome measures were derived from participants' self-report of violent and nonviolent delinquent behavior. Behavioral trajectories of male participants indicated continuity in problem behavior from childhood to adolescence, especially among those who demonstrated physical aggression in childhood. Chronic physical aggression during elementary school significantly predicted physical violence and other nonviolent forms of delinquency during adolescence. In contrast, results indicated no clear relationship between childhood physical aggression and later adolescent offending among females.

Early and risky sexual behaviors. Research has consistently linked externalizing problems to early sexual onset and other risky sexual behaviors (Boislard & Poulin, 2011; Capaldi, Stoolmiller, Clark, & Owen, 2002; French & Dishion, 2003; Siebenbruner, Zimmer-Gembeck, & Egeland, 2007). Early sexual onset is typically defined as sexual intercourse occurring during preadolescence (12 and younger) or very early in adolescence (15 and younger). In addition to the numerous studies demonstrating a concurrent relationship between externalizing symptoms and risky sexual behavior, a growing body of longitudinal research indicates that externalizing symptoms during childhood are a precursor of early sexual activity (Huang, Murphy, & Hser, 2012; Moilanen, Crockett, Raffaelli, & Jones, 2010; Schofield, Bierman, Heinrichs, Nix, 2008; Skinner et al., 2015). For example, Schofield et al. (2008) followed a sample of 694 boys and girls from kindergarten through high school. Structural equation models revealed that, regardless of gender or race, high rates of aggression, disruption, and attention problems at school entry increased the risk for antisocial problem behaviors in middle school, which promoted early sexual activity.

Several longitudinal studies have also investigated sexual development over time by examining the trajectories of specific subgroups of students with varying levels of risk. One such study identified four distinct trajectories of sexual risk from ages 16 to 22 and found that participants with delinquent behaviors were more likely to belong to the high-risk group (Moilanen et al., 2010). Similarly, Huang et al., (2012) identified five trajectories of sexual risk behaviors from ages 15 to 23 and found delinquent behavior at age 14 to be highly associated with membership in the higher-risk group. Analogous findings have emerged in research of international populations as well. A recent longitudinal study of 1,200 Australian youth (Skinner et al., 2015) found that participants with clinically significant Child Behavior Checklist scores ($T \geq 60$) during childhood were at increased risk for early onset of sexual behavior during adolescence. Specifically, externalizing problems among boys starting at age 5 and girls at 10 significantly increased the risk of having sexual intercourse before age 16.

Although the onset of sexual activity is a normal part of human development, early sexual activity has been identified as an important predictor of a range of risky behaviors and adverse outcomes (Skinner et al., 2015). It is related to a variety of concurrent risk factors such as school maladjustment, antisocial activity, and substance use (Schofield et al., 2008). In addition, adolescents who engage in early sexual activity tend to accumulate more sexual partners over time (Rotermann, 2008) and are more likely to engage in unprotected sex (Kaestle, Halpern, Miller, & Ford, 2005; Magnusson, Masho, & Lapane, 2012; Siebenbruner et al. 2007). These risky sexual behaviors are associated with negative social and health outcomes, including partner violence, lower educational attainment, unintended pregnancy, and sexually transmitted infection (Kaestle et al., 2005; Spriggs & Halpern, 2008; Steward et al., 2009; Watson, Taft, & Lee, 2007).

Alcohol and drug use. Alcohol and drug use are common among young people in the United States, but most cases of abuse and dependency have their initial onset during adolescence (Swendsen et al., 2012). The patterns of alcohol and drug use that emerge during adolescence are important determinants of later substance use behavior and associated disorders (Perkonigg et al., 2006; Swendsen et al., 2012).

It is also important to note that alcohol and substance use have been correlated with a number of other risky behaviors, particularly among adolescents with disruptive behavior disorders (Schutter, Bokhoven, Vanderschuren, Lochman, & Matthys, 2011). For example, alcohol, tobacco, and marijuana use have been associated with risky sexual activity (Feldstein & Miller, 2006; Rossi, Poulin, & Boislard, 2017; Sarver et al., 2014; Schofield et al., 2008). For many adolescents, risky sexual behavior, such as unplanned or unprotected sexual intercourse, occurs while using drugs or alcohol (Bonomo et al., 2001).

The association between adolescent substance use and externalizing problems, such as antisocial behavior, aggression, and defiance is well established. In a literature review of adolescent substance use and psychiatric comorbidity, Armstrong and Costello (2002) found that disruptive behavior disorders such as conduct disorder (CD) and oppositional defiant disorder (ODD) were the most commonly diagnosed conditions among adolescents who engaged in substance use or abuse with a median prevalence of 46% across studies. In more recent years, particular attention has been focused on the extent to which children with early externalizing disorders are at increased risk for alcohol and substance use during adolescence.

A large body of literature shows that externalizing problems exhibited during childhood are a major risk factor for later alcohol and drug abuse (Farmer et al., 2015; Farmer et al., 2016; Fergusson et al., 2005; Fergusson, Horwood, & Ridder, 2007; Schofield et al., 2008). Data from

a 25-year longitudinal study of 1,265 children revealed that conduct problems in childhood and adolescence were significantly associated with substance use, abuse, and dependence (Fergusson et al., 2007). Similarly, alcohol use in adolescence has been associated with aggressive, antisocial, and disruptive behaviors during childhood (Burk et al., 2011; Farmer et al., 2016; Fergusson et al., 2005; Kuperman et al, 2001).

In summary, numerous cross-sectional and longitudinal studies have demonstrated a clear relationship between externalizing symptoms and maladaptive risky behavior during adolescence. Injury, violence, risky sexual behavior, and substance use are often interrelated and can result in a multitude of negative outcomes throughout the life course.

Internalizing symptoms. Poor short- and long-term outcomes are not limited to students with only visible or overt externalizing problems. Adolescents with internalizing problems commonly display symptoms such as excessive sadness, fear, anxiety, depressive affect, and social withdrawal (Achenbach, 1990; Achenbach & McConaughy, 1997). These symptoms have been associated with impairment in academic performance and social and family functioning (Garber & Weersing, 2010; Liu, Chen, & Lewis, 2011; Rapport, Denney, Chung, & Hustace, 2010). Further, as with externalizing problems, significant internalizing problems may have an impact on long-term outcomes through negative effects on adult relationships, employment, and physical health (Merikangas et al., 2010, Perle et al., 2013). A multitude of empirical studies have explored the relationship between internalizing problems and the priority health risk behaviors identified by the CDC.

Behaviors that contribute to unintentional injuries and violence. Overall, research suggests a relationship between internalizing symptoms and behaviors that contribute to

unintentional injuries and violence. However, the specific types of injurious or violent behaviors may differ from those exhibited by adolescents with externalizing problems.

With regard to behaviors that contribute to unintentional injury, some studies have found internalizing behaviors to be associated with increased risk of injuries among adolescents (Rowe et al., 2004; Rowe et al., 2007), but these results have not been demonstrated consistently. In contrast to the findings that externalizing behavior predicted increased injury risk, Jokela et al. (2009) found that internalizing symptoms decreased the likelihood of physical injury. Similarly, Lee, Wadsworth, and Hotopf (2006) found that high levels of anxiety decreased the risk of accidental death up to the age of 25. The authors posited that avoidant and withdrawn behaviors, which comprise internalizing problems, might protect adolescents from unintentional injury rather than increase their exposure (Lee et al., 2006). This theory is supported by previous research that suggested adolescents who exhibit internalizing problems were often unable to form good peer relationships and were more likely to engage in isolating behaviors and social withdrawal (Oland & Shaw, 2005). These isolating behaviors may prevent adolescents from affiliating with delinquent peers, which in turn lowers the risk for delinquent behaviors (Fanti & Henrich, 2010; Oland & Shaw, 2005).

Whereas much of the literature tends to focus on externalizing youth as perpetrators of violent behavior toward others, the majority of research on internalizing problems examines violence victimization among depressed or anxious teens. For example, a number of studies have established a relationship between depression and dating violence, both physical and sexual (Holt & Espelage, 2005; Rizzo et al., 2012; Wolitzky-Taylor et al., 2008). Also, of great concern is the apparent link between internalizing disorders and self-harm.

As previously mentioned, suicide is the third leading cause of death among adolescents in the United States (Kann et al., 2016). Adolescent reports of suicidal ideation and behaviors are associated with depression and anxiety, and these behaviors are often overlooked by parents and teachers and persist into adulthood (Joffe, Van Lieshout, Duncan, & Boyle, 2014). Data from 11 national YRBS surveys from 1991–2011 revealed that during the 12 months before the survey female students were significantly more likely than male students to have seriously considered suicide (19.3% vs. 12.5%), to have made a plan about attempting suicide (15.0% vs. 10.8%), to have attempted suicide (9.8% vs. 5.8%), and to have attempted suicide with injuries requiring medical treatment (2.9% vs. 1.9%; Lowry, Crosby, Brener, & Kann, 2014). These gender differences may be explained by the higher prevalence of internalizing symptoms among female adolescents (Avenevoli, Swendsen, He, Burstein, & Merikangas, 2015; Merikangas et al., 2010).

Risky sexual behaviors. As previously discussed, cross-sectional and longitudinal studies indicate that externalizing behaviors are linked with early and risky sexual behaviors. However, research findings demonstrating an association between internalizing symptoms and sexual risk behavior are not as robust (Donenberg, Bryant, Emerson, Wilson, & Pasch, 2003; Ethier et al., 2006; Lehrer, Shrier, Gortmaker, & Buka, 2006; Lescano, Brown, Hadley, D'Eramo, & Zimskind, 2007; Mazzaferro et al., 2006; Ramrakha et al., 2007; Shrier, Harris, Sternberg, & Beardslee, 2001; Skinner et al., 2015; Waller et al., 2006).

A number of studies have reported a positive relationship between internalizing behaviors and sexual risk-taking (Ethier et al., 2006; Grello, Welsh, Harper, & Dickson, 2003; Mazzafero et al., 2006; Monahan & Lee, 2008; Skinner et al., 2015). For example, in a study of 155 sexually active adolescent females, internalizing symptoms were associated with a number of risky sexual behaviors (Ethier et al., 2006). More specifically, a structural equation model

demonstrated that low self-esteem was related to early sexual initiation and a history of risky partners, whereas participants with more emotional distress (e.g., depression, anxiety, stress) were less likely to have had a previous STI, but had more sexual partners as well as a history of risky partners. Further, low self-esteem predicted increased risk for having unprotected sex, whereas levels of emotional distress influenced the number of sexual partners. In another example, among a sample of 1,200 Australian youth, Skinner et al. (2015) found that internalizing problems in middle to late childhood (ages 8 and 10) were significantly associated with early sexual activity, but only for boys. Findings suggest that the relationship between internalizing symptoms and sexual behavior is complicated and that different aspects of risky sexual behavior may be associated with different internalizing symptoms.

Overall, findings regarding the effects of internalizing problems on risky sexual behavior are inconsistent. Several studies suggest a weak or nonexistent link between internalizing problems and risky sexual behavior (Boislard, Dussault, Brendgen, & Vitaro, 2013; Boislard & Poulin, 2011; McLeod & Knight, 2010; Rossi et al., 2017). The relationship between internalizing problems and early sexual activity sometimes attenuates or disappears when examined in multivariate predictive models (Boislard et al., 2013; Boislard & Poulin, 2011; Caminis, Henrich, Ruchkin, Schwab-Stone, & Martin, 2007). In a longitudinal study that examined the psychosocial factors associated with risky sexual behavior among 1,175 early adolescents, Caminis et al. (2007) found that externalizing problems were more predictive of sexual risk than internalizing problems. More specifically, symptoms of anxiety during middle school were actually associated with lower rates of sexual initiation. In another longitudinal study, McLeod and Knight (2010) had similar findings. Using data from the Children of the National Longitudinal Surveys of Youth (N = 1,836), analyses revealed that the relationship

between internalizing symptoms and risky sexy sexual behavior was not significant when controlling for externalizing problems.

A perspective proposed by some researchers is that internalizing symptoms may delay sexual intercourse as opposed to promoting it (Boislard et al., 2013; Capaldi, Crosby, & Stoolmiller, 1996; Rossi et al., 2017). This theory suggests that symptoms of internalizing behaviors, such as low self-esteem and social withdrawal, decrease attractiveness to peers, healthy social relationships, and consequently, opportunities to engage in sexual behavior. Moreover, people with internalizing problems, particularly anxiety, may avoid situations like sexual activity because of fears regarding STIs, unplanned pregnancies, or being caught by parents (Blinn-Pike, Berger, Hewitt, & Oleson, 2004). This idea was supported in a longitudinal study of 343 students who were followed annually from kindergarten until age 15 (Boislard et al., 2013). Controlling for age of pubertal onset, social preference, prior sexual abuse, and family risk (e.g., one- or two-parent household, education level and occupation of parents), Boislard and colleagues (2013) found that boys who had high levels of internalizing problems were not at greater risk for early sexual onset than peers without internalizing problems, even when accompanied by high levels of externalizing problems. However, in accordance with previous longitudinal research on externalizing disorders, results also indicated that children who demonstrated early externalizing problems, and no internalizing problems, were most at risk for maladaptive behavior in adolescence.

Alcohol and drug use. Compared to externalizing behavior problems, the role of internalizing problems in the development of alcohol and substance abuse has received little research attention (Hussong, Jones, Stein, Baucom, & Boeding, 2011). Although cross-sectional research indicates that internalizing symptoms often occur concurrently with alcohol and

substance abuse (Armstrong & Costello, 2002; Blumenthal, Leen-Feldner, Frala, Badour, & Ham, 2010; Chan, Dennis, & Funk, 2008), longitudinal studies examining the predictive relationship between internalizing symptoms and future alcohol and substance use have produced mixed results (Buckner et al., 2008; Buckner & Turner, 2009; Costello, Erkanli, Federman, & Angold, 1999; Elkins, King, McGue, & Iacono, 2006; Farmer et al., 2015; Farmer et al., 2016; Perkonigg et al., 2008; Wittchen et al., 2007; Zimmermann et al., 2003).

Some studies have found that internalizing symptoms predict later alcohol and drug use (Buckner et al, 2008; Costello et al., 1999; Kaplow, Curran, Angold, & Costello, 2001; Wittchen et al., 2007). For example, a prospective analysis based on Oregon Adolescent Depression Project (OADP) data (Buckner et al., 2008) found that a diagnosis of social phobia at baseline was associated with an increased risk for cannabis dependence at a 14-year follow-up. This study, however, exercised limited control over concurrent or lifetime externalizing psychopathology that might account for longitudinal associations between social phobia and cannabis dependence. Therefore, Farmer et al. (2015) used the same longitudinal dataset to examine cannabis use among adolescents and young adults, but controlled for externalizing symptoms. When analyzed separately from externalizing disorders, internalizing disorders did not significantly predict cannabis use. Similarly, findings reported by Colder et al. (2013) imply that internalizing features in the absence of externalizing features may act as a protective factor against drug use. Mixed findings concerning internalizing features may be related to differences in statistical control of psychopathology-related confounders across studies.

In another example, Kaplow, Curran, Angold, and Costello (2001) examined the relationship between early anxiety symptomatology and alcohol use in a longitudinal study of 936 children between the ages of 9 and 13. Results demonstrated that children with symptoms of

generalized anxiety were found to be at increased risk for initiation of alcohol use, whereas children with symptoms of separation anxiety were at decreased risk. The relationships were equally strong for boys and girls. In addition, early depressive symptomatology was associated with increased risk for initiation of alcohol use in adolescence. Moreover, research examining symptoms of depression have suggested a positive relationship with alcohol use, drug use, and smoking (Boden, Fergusson, & Horwood, 2010; Hussong & Hicks, 2003; Hussong et al., 2011). To explain this relationship, researchers have pointed to a theory of self-medication, which asserts that adolescents engage in risky behavior in order to cope with, or alleviate negative emotions (Boden et al., 2010; Hussong et al., 2011). The results of these studies indicate that it is important to consider specific dimensions of anxiety and depression symptomatology when attempting to identify adolescents who are at risk for alcohol and substance abuse.

Overall, findings regarding effects of internalizing problems on risky behavior are inconsistent. Divergent theories suggest that internalizing problems such as anxiety, depression, and withdrawal may limit risk-taking behaviors, or alternatively, be seen as a means to cope with or relieve those symptoms. Conflicting research findings may be attributed to the array of variables that have been used to assess internalizing problems (e.g., anxiety, depression, social withdrawal, low self-esteem) and the lack of statistical control over confounding externalizing psychopathology. Further research is needed to fully understand the relationship between internalizing symptoms and risky behavior.

Comorbid externalizing and internalizing behavior symptoms. Although Achenbach (1966) initially referred to internalizing and externalizing problems as dichotomous factors influencing specific pathways of behavior, more recent research asserts that internalizing and externalizing symptoms often co-occur (Beyers & Loeber, 2003; Fanti & Henrich, 2010). For example, Weiss and Catron (1994) found strong positive associations between internalizing and externalizing behaviors. Expanding on those findings, Eisenberg, Cumberland, Spinrad, and Fabes (2001) found positive associations between internalizing symptoms of anxiety, depression, and withdrawal, with externalizing variables such as anger, frustration, and aggression. Findings suggest that when early internalizing problems remain untreated throughout childhood, there is an increased likelihood that severe pathology, or comorbid internalizing and externalizing symptomatology, will present as the child ages. Therefore, several researchers have suggested that co-occurring internalizing and externalizing problems should be regarded as a distinct syndrome (Angold, Costello, & Erkanli, 1999; Lilienfeld, 2003; Fanti & Henrich, 2010).

Several studies have focused on outcomes of adolescents with comorbidity compared with those with either internalizing or externalizing symptoms alone. Some of these studies report more functional, physical, educational and social impairment among comorbid youth (Lewinsohn, Rohde, & Seeley, 1995; Miller-Johnson et al., 1998; Newman, Moffitt, Caspi, & Silva, 1998; Oland & Shaw, 2005; Renouf, Kovacs, & Mukerji, 1997), whereas others do not (Ezpeleta, Domenech, & Angold, 2006; Steinhausen & Reitzle, 1996). In terms of long-term functioning however, numerous studies provide evidence that adolescents with comorbid internalizing and externalizing disorders appear to experience long-term problems to a greater extent than those with either internalizing or externalizing problems alone (Hoeve, McReynolds, & Wasserman, 2015). Research suggests that children with co-occurring disorders have an

earlier age of onset (Newman et al., 1998), more serious and chronic disturbances (Newman et al., 1998; Youngstrom, Findling, & Calabrese, 2003), and worse developmental outcomes than children with only a single diagnosis (Keiley, Lofthouse, Bates, Dodge, & Petit, 2003). Once a child develops comorbid externalizing-internalizing problems, symptoms are likely to remain stable or increase (Newman et al., 1998; Reitz, Dekovic, & Meijer, 2005; Youngtsrom et al., 2003). Without intervention, these symptoms may spiral into more severe maladjustment in adolescence.

The study of comorbid problems is of particular importance because there is emerging evidence that internalizing problems may serve as either a risk factor or a protective factor for risk-taking behavior among adolescents with externalizing disorders. Currently, however, the specific circumstances in which internalizing problems exacerbate or attenuate risk-taking are unclear (Cunningham & Ollendick, 2010). For instance, several longitudinal studies suggest that anxiety reduces the severity and course of externalizing conduct problems, thereby reducing the likelihood of maladaptive risky behavior (Boislard et al., 2013; Mason et al., 2004; Pine, Cohen, Cohen, & Brooke, 2000). In contrast, other studies suggest that youth with comorbid internalizing and conduct problems may display increased levels of symptomatology, impairment, and adjustment problems, and are more likely to be negatively influenced by deviant peers. Subsequently, these outcomes lead to increased risk-taking (Hoeve et al., 2015, Fanti & Henrich, 2010). Overall, research in this area remains underdeveloped and limited to only a few areas of health-risk behaviors (i.e., criminal behavior, risky sexual behavior, and alcohol/substance use).

Criminal behavior. Across a range of studies and samples, adolescents with co-occurring externalizing and internalizing disorders appear to experience long-term problems in functioning,

particularly concerning criminal behavior. For example, a community study of 1,420 children, ages 9 to 13, diagnosed with this disorder profile revealed that they were significantly more likely to be arrested during young adulthood than were non-disordered children (Copeland, Miller-Johnson, Keeler, Angold, & Costello, 2007). In another longitudinal study with similar findings, 131 children and adolescents were followed into adulthood. Depressed adolescents with comorbid conduct disorder were more likely to commit crimes as adults, compared to those with depression only (Harrington, Fudge, Rutter, Pickles, & Hill, 1991). More recently, Hoeve, McReynolds, and Wasserman (2015) examined the behaviors of 6,691 adolescents at juvenile probation intake. Differences in offending characteristics were compared between adolescents with comorbid internalizing and disruptive behavior disorders, and those with either and internalizing disorder or disruptive behavior disorder alone. Students with comorbid disorders were more likely to be repeat offenders. Further, students with comorbid disorders reported significantly higher rates of victimization by violence and reported increased levels of symptomatology. This study provides even more support to the existing research demonstrating that comorbid internalizing disorders and disruptive behavior disorders increased the risk of later offending in young adulthood.

Risky sexual behaviors. Little is known about the relationship between comorbid internalizing and externalizing problems and risky sexual behavior. As previously discussed, numerous studies have examined internalizing and externalizing psychopathology separately, but most fail to successfully analyze comorbid problems in comparison to internalizing and externalizing problems alone. Boislard et al. (2013) conducted a 10-year longitudinal study of 343 students from kindergarten until age 15. Teacher ratings of internalizing and externalizing behaviors were collected annually for each participant. In addition, self-report data of sexual

behavior were collected annually from students during the last 3 years of the study. Controlling for pubertal development, social preference, sexual abuse and sociofamily risk (e.g., family structure, parent education level, parent age at birth of first child), researchers found that boys with high levels of externalizing and low levels of internalizing problems were at increased risk of earlier sexual onset. Boys and girls with high levels of both internalizing and externalizing behaviors were not found to be at increased risk. Authors speculated that boys with externalizing problems and concomitant internalizing problems may refrain from early sexual activity because they are too anxious to initiate sexual contacts. They also hypothesized that aggression combined with anxiety may result in social impairment, whereas those who are aggressive, but also proactively engaged are often more accepted by their peers (Vitaro & Brendgen, 2011). Further research in this area certainly warranted.

Alcohol and drug use. Existing research suggests that adolescents with co-occurring internalizing and externalizing symptoms experience increased risk for alcohol and substance use and abuse (Chan et al., 2008; Fanti & Henrich, 2010). For example, Chan, Dennis, and Funk (2008) analyzed data from 4,930 adolescents admitted for substance abuse treatment, finding that approximately 61% had both internalizing and externalizing problems. Results also indicated that the estimated risks for substance dependency were greater for adolescents with both internalizing and externalizing behaviors than for those with internalizing or externalizing behavior alone. Similarly, an examination of adolescents with comorbid internalizing and externalizing symptoms indicated that they were more likely to use alcohol, have personal involvement with chemicals, and have a greater preoccupation with substance use than adolescents with only externalizing difficulties (Rowe, Liddle, & Dakof, 2001).

Two recent studies demonstrated a significant interaction between externalizing and

internalizing symptoms predicting alcohol use (Colder et al., 2017, Colder et al., 2018). Colder et al. (2018) followed 387 adolescents from early (11 to 12 years old) to late (18 to 19 years old) adolescence to test whether externalizing symptoms moderated the relationship between internalizing symptoms and trajectories of alcohol and marijuana use. Results suggested that externalizing symptoms moderated the association between internalizing symptoms and alcohol use, but not marijuana use. The highest probability of alcohol use was observed at high levels of externalizing symptoms and low levels of internalizing symptoms. Authors concluded that there was a negative protective effect of internalizing symptoms on alcohol use among early adolescents who had high levels of externalizing symptoms.

In a similar study in 2017, Colder et al. examined specific clusters of internalizing problems and found that symptoms of generalized anxiety, social anxiety and depression were associated with increased alcohol use among adolescents with low levels of externalizing symptoms, and decreased alcohol use among adolescents with high levels of externalizing symptoms. The authors posited that drinking to cope with emotional distress may be a prominent feature of a risk pathway for adolescents characterized by high internalizing and low externalizing symptoms. In contrast, adolescents with low levels of internalizing symptoms and high levels of externalizing symptoms are likely to be disinhibited and have trouble regulating their behavior, which may lead to excessive drinking. However, high levels of internalizing symptoms, when co-occurring with high levels of externalizing symptoms, may provide some protection against alcohol use associated with externalizing symptoms. Internalizing symptoms in this context may be associated with social withdrawal or fear and worry about the excessive drinking (Colder et al., 2017; Colder et al., 2018).

To summarize, research findings regarding the effects of comorbid internalizing and externalizing problems are limited and inconsistent across different areas of health-risk behaviors. Further it is unclear under what circumstances internalizing symptoms serve as a risk factor or a protective factor for risky behavior in youth with comorbid externalizing problems. A probable reason for the lack of clarity surrounding this issue is that most studies fail to analyze or compare the various dimensions of anxiety and depression, which may predict risky behavior in different ways. Additional quality research is needed to fully understand the relationships between externalizing symptoms, specific symptoms of anxiety and depression, and risky behavior.

Protective Factors for Risky Behavior

Efforts to improve child and adolescent health have typically been focused on the prevention of the priority health-risk behaviors delineated by the CDC. However, results from a growing number of studies suggest that a greater impact might be achieved by also enhancing protective factors that help children and adolescents avoid multiple behaviors that place them at risk for adverse health and educational outcomes. Protective factors are individual or environmental characteristics, conditions, or behaviors that reduce the effects of stressful life events (CDC, 2009). These factors also increase an individual's ability to avoid risks or hazards and promote social and emotional competence to thrive in all aspects of life, now and in the future. The CDC has identified three main areas of protective factors that help promote adaptive behavior and prevent risky behavior among adolescents: school connectedness, positive parenting practices, and parent engagement. In addition, research points to academic achievement, which is heavily influenced by school connectedness, as an important indicator of health and well-being during adolescence and as a predictor of outcomes during adulthood. The

relationship between these protective factors and decreased risk-taking has been supported by longitudinal research.

School engagement. School engagement is defined as the belief held by students that adults and peers in their school care about their learning and about them as individuals (CDC, 2009; Jessor, Van Den Bos, Vanderryn, Costa, & Turbin, 1995). School engagement or connectedness has been associated with positive outcomes such as health, overall well-being, and academic achievement (Chapman, Buckley, Sheehan, & Shochet, 2013; Wang & Eccles, 2012a, 2012b; Wentzel, Battle, Russell, & Looney, 2010). Additionally, lack of school connectedness has been associated with negative behaviors and outcomes, including school failure and dropout (Battin-Pearson et al., 2000; Li & Lerner, 2011; Wang & Fredericks, 2014), depression (Shochet, Dadds, Ham, & Montague, 2006), delinquency (Bolland et al., 2016; Rudasill et al., 2010), and affiliation with deviant peers (Denny et al., 2011).

Research has shown that children and adolescents who feel connected to their schools are less likely to engage in many risk behaviors, including early sexual activity, alcohol use, tobacco use, drug use, violence and gang involvement (Bond et al., 2007; Chapman, Buckley, Sheehan, Shochet, & Romaniuk, 2011; Chapman et al., 2013; Dornbusch, Erickson, Laird, & Wong, 2001; McNeely, Nonnemaker, & Blum, 2002; Resnick, Harris, & Blum, 1993; Resnick et al., 1997; Wormington, Anderson, Schneider, Tomlinson, & Brown, 2016). The National Longitudinal Study of Adolescent to Adult Health (Add Health) is a longitudinal study of a nationally representative sample of adolescents in grades 7 through 12 in the United States, which began during the 1994–1995 school year. Resnick and colleagues (1997) used Add Health data to examine risk and protective factors associated with adolescent health and well-being. A cross-sectional analysis of interview data from 11,572 participants indicated that school connectedness,

parent-family connectedness, and high parental expectations for academic achievement were protective against a range of adverse behaviors. In particular, school connectedness was found to be the strongest protective factor for both boys and girls related to decreases substance use, school absenteeism, early sexual initiation, violence, and risk of unintentional injury (e.g., drinking and driving, not wearing seat belts). In addition, school connectedness was second in importance, after family connectedness, as a protective factor against emotional distress, disordered eating, and suicidal ideation and attempts.

Research has also demonstrated a strong relationship between school connectedness and educational outcomes, including school attendance, staying in school longer, and higher grades and classroom test scores (Battin-Pearson et al., 2000; Wang & Eccles, 2012a; Wentzel et al., 2010). For example, Wang and Eccles (2012a) used data from 1,148 adolescents who participated in the Maryland Adolescent Development in Context Study (MADICS), a subsample of the Study of Adolescents in Multiple Contexts (SAMC; Cook, Herman, Phillips, & Setterson, 2002), to examine the developmental trajectories of three dimensions of school engagement (i.e., school participation, sense of school belonging, and self-regulated learning) from grades 7 to 11 and their relationships to changes in academic outcomes over time. Hierarchical linear models revealed that declines in school participation and self-regulated learning were associated with declines in grade point average. In addition, decreases in school participation, school belonging, and self-regulated learning were associated with decreases in educational aspirations. Academic achievement, which is promoted by school connectedness, is also an important factor in promoting adaptive behavior and preventing unnecessary risk-taking.

Academic achievement. Academic performance is commonly viewed as a key indicator of overall well-being during adolescence and as a primary predictor and determinant of adult

health outcomes (Michael, Merlo, Basch, Wentzel, & Wechsler, 2015). Numerous studies show a strong connection between academic achievement and health-related behaviors (Bradley & Greene, 2013; Busch et al., 2014; Demmler et al., 2017; Michael et al., 2015; Rasberry et al., 2017). In addition, research suggests that academic success can mitigate social stressors and provide access to employment opportunities and experiences that could protect individuals from disadvantages later in life (Basch, 2011; Harper & Lynch, 2007; Silles, 2009).

As a result of adequate academic achievement, students may be less likely to engage in maladaptive risky behavior (Basch, 2011; Bradley & Greene, 2013; Demmler et al., 2017; Rasberry et al., 2017). Low educational performance (e.g., poor grades and test scores, lower educational attainment) has been consistently linked to adolescent risky behavior (Bradley & Greene, 2013; Carlson et al., 2008; Spriggs & Halpern, 2008). Therefore, Bradley and Greene (2013) reviewed 122 articles published between 1985 and 2010 in order to synthesize evidence about the association of academic achievement and adolescent risk-taking. For all six health-risk behaviors identified by the CDC (i.e., violence, tobacco use, alcohol and other drug use, sexual behaviors contributing to unintended pregnancy and STI, inadequate physical activity, unhealthy dietary behaviors), 96.6% of the reviewed studies reported statistically significant inverse relationships between risky behavior and academic achievement. Moreover, longitudinal studies in the review concluded that less engagement in risky behavior during adolescence leads to higher achievement later in life, and that earlier academic achievement leads to fewer health-risk behaviors later in life. Although causation cannot be inferred from these findings, causal relationships are believed to exist in both directions between education and health (Basch, 2011; Bradley & Greene, 2013; Rasberry et al., 2017). More recently, a study by the CDC produced similar findings (Rasberry et al., 2017). Rasberry and colleagues (2017) assessed the

relationship between academic achievement (i.e., self-reported letter grades in school) and priority health-risk behaviors using nationally representative data from 15,624 high school students who completed the 2015 national YRBS. Logistic regression models controlling for sex, race/ethnicity, and grade in school found that students who earned mostly A's, B's, or C's had significantly higher prevalence estimates for healthy eating and physical activity and significantly lower prevalence estimates for substance use, sexual risk, violence, and suicide-related behaviors than students who earned mostly D's or F's.

Positive parenting practices and engagement. The choices that parents make during the formative years of adolescence have important implications for their child's development, including likelihood of engaging in risk-taking behaviors. Parents and families play an important role in shaping the health of adolescents, as research shows that teens who believe their parents disapprove of risky behaviors are less likely to engage in them (Brendgen, Vitaro, Tremblay, & Lavoie, 2001). Research suggests that parents can help deter adolescent risky behavior by using more positive practices, engaging with the school, and effectively monitoring their teen.

Some studies show that parent influence may affect an adolescent's likelihood of engaging in risky behaviors (Elkington, Bauermeister, & Zimmerman, 2011; Whitaker & Miller, 2000). More specifically, exposure to harsh parenting may increase the likelihood that an adolescent will decide to engage in risky behavior (Alati et al., 2014; Guilamo-Ramos et al., 2012), whereas positive and supportive parenting is likely to decrease adolescent involvement in risky behavior (Mumford, Liu, & Taylor, 2016; Parkes, Henderson, Wight, & Nixon, 2011; Resnick et al., 1997). For example, data from the National Longitudinal Study of Adolescent to Adult Health were used to examine the relationship between parent-family connectedness (e.g., feelings of warmth, love, and caring from parents) and adolescent health-risk behavior (i.e.,

suicidal thoughts and behaviors; violence; cigarette, alcohol, and marijuana use; age of sexual debut; pregnancy history). Multivariate regression analyses indicated that parent-family connectedness was protective against every health risk behavior measure except history of pregnancy. Further, when parents are engaged in their children's school activities, their children get better grades, choose healthier behaviors, and have better social skills (Resnick et al., 1997). Data from the National Longitudinal Study of Adolescent to Adult Health also revealed that high parental expectations for academic achievement were protective against violence and tobacco use (Resnick et al., 1997).

Research shows that teens whose parents use effective monitoring practices are less likely to make poor decisions, such as having sex at an early age, smoking cigarettes, drinking alcohol, being physically aggressive, or skipping school (Barnes, Hoffman, Welte, Farrell, & Dintcheff, 2006; Borawski, Ievers-Landis, Lovegreen, & Trapl, 2003; DiClemente et al., 2001; Huebner & Howell, 2003; Li, Feigelman, & Stanton, 2000; Markham et al., 2010; Rai et al., 2003; Resnick et al., 1997; Rossi et al., 2017; Sneed, Strachman, Nguyen, & Morisky, 2009). Rai et al. (2003) assessed the impact of parental monitoring on the risk behaviors 1,279 low income, predominantly African-American adolescents aged 13 to 16 years. Baseline data were collected from six cohorts of adolescents who were involved in community-based studies conducted over a decade in an urban area. Data were analyzed using multiple logistic regression. Results indicated that parental monitoring had a protective influence on substance use behaviors (i.e., cigarette, alcohol, and marijuana use; drug-selling), sexual activity (i.e., had sex ever), and violence.

Summary and Research Gaps within Current Literature

Adolescent risk-taking can result in enormous individual and societal consequences.

Therefore, a large body of research has examined the risk factors and protective factors associated with maladaptive risky behavior. Research demonstrates that certain demographic characteristics (i.e., gender, SES, disability), influence of deviant peers, and demonstration of emotional and behavioral problems, particularly externalizing behaviors, are significantly associated with a plethora of risky behaviors. Alternatively, school connectedness, academic achievement, and positive parenting can protect adolescents from maladaptive risk-taking. Although there has been considerable investigation of various factors that contribute to risky behavior among adolescents in the United States, several areas of limitation within the current research base remain.

Numerous cross-sectional and longitudinal studies have investigated the development of internalizing and externalizing symptomatology during adolescence, the association between behavior problems and maladaptive risk-taking, and the resulting emotional and physical health issues in adulthood. However, findings regarding the effects of internalizing problems on risky behavior during adolescence are contradictory. The profusion of students with complex presentations of co-occurring needs may be a significant factor in the conflicting research investigating the role of internalizing symptoms, as numerous studies have failed to control for confounding externalizing psychopathology in their analyses. In addition, there is theoretical disagreement on whether students with high levels of internalizing problems are more likely to engage in risky behaviors to cope with stressors, or if symptoms of fear, anxiety and social withdrawal prevent risky behaviors from occurring. A possible reason for this disagreement is that much of the existing research has examined internalizing problems as a single construct and failed to separately analyze and compare different aspects of internalizing disorders (e.g., social anxiety, separation anxiety, negative affect, somatic complaints). Therefore, it is important that

future research consider specific dimensions of anxiety and depression symptomatology when attempting to identify adolescents who are at risk for maladaptive behavior.

Independent analyses of externalizing and internalizing problems clearly demonstrate that these problems are associated with a multitude of poor short- and long-term outcomes, but the confusion surrounding comorbid internalizing and externalizing psychopathology and its relationship to adolescent risk-taking is a major area of limitation within the current research base. Little research exists in this area and the available research is inconsistent in its findings. Few studies have directly compared the risk-taking behavior among groups of students with externalizing, internalizing, and comorbid externalizing and internalizing problems. Further research is necessary in order to determine how the severity of comorbid symptoms may predict maladaptive risky behavior compared to students with internalizing or externalizing problems alone. Additionally, it is unclear which specific symptoms of depression and anxiety serve as risk factors or protective factors for risky behavior in youth with comorbid externalizing problems.

Although previous research has identified protective factors that may reduce the likelihood of risky behavior among adolescents (e.g., academic achievement, school engagement, and positive parenting), it is unknown whether the impact of those factors is consistent among adolescents with different types of behavior problems. To date, no existing research studies have examined academic achievement, school engagement, or positive parenting practices as potential moderators between types of behavioral symptoms (i.e., externalizing, internalizing, comorbid externalizing and internalizing) and risky behavior. Thus, it is unclear whether various protective factors impact students with externalizing, internalizing, and

comorbid behavioral symptoms similarly. Additional research in this area is necessary in order to understand risk and protective factors for students with different behavioral profiles.

Overall, research is limited in identifying the specific behavioral factors associated with risky behavior among secondary students who exhibit complex emotional and behavioral challenges. Therefore, this study had three main purposes: (a) to explore differences in self-reported risk-taking behaviors (i.e., smoking/tobacco use, alcohol use, marijuana use, sexual behavior, and depression/suicidal behavior) among adolescents with different types of behavioral symptoms (high levels of externalizing, high levels of internalizing, and high levels of comorbid externalizing and internalizing symptoms); (b) to investigate the interaction effects of behavioral symptoms with levels of academic functioning, school engagement, and positive parenting to assess whether those factors protect adolescents from risky behavior consistently across the three symptom groups (high internalizing, high externalizing, and high externalizing/internalizing); and (c) to determine if the relationship between externalizing problems and each type of risky behavior was moderated by symptoms of anxiety (i.e., physical symptoms, harm avoidance, separation anxiety/panic, and social anxiety) or depression (i.e., dysphoric mood, negative affect, negative self-evaluation, and somatic complaints).

Chapter 3

Methodology

Data from a larger study (Center for Adolescent Research in Schools; CARS) were used to answer the research questions. CARS was a national center funded by the Institute of Education Sciences (IES) with the purpose of developing and evaluating a multi-component intervention package designed to improve outcomes for high school students with severe social, emotional, and behavioral problems (Kern et al., 2015). The intervention package was evaluated using a 2-year randomized controlled trial (RCT).

Participants and Setting

School characteristics. Fifty-four high schools across five states participated in the CARS RCT. Schools in Kansas (n = 5), Missouri (n = 7), Ohio (n = 16), Pennsylvania (n = 10), and South Carolina (n = 16) were selected based on proximity to the universities of study researchers and willingness to engage in project activities. Participating schools were fairly evenly distributed with respect to community location (defined by the U.S. Department of Education), with 39% suburban (n = 21), 37% rural (n = 20), and 24% urban (n = 13). The size of the schools varied, with three smaller than 500 students, 16 with 501 to 1,000 students, 11 with 1,001 to 1,500 students, 16 with 1,501 to 2,000 students, three with 2,001 to 2,500 students, three with 2,501 to 3,000 students, and two with over 3,000 students. The total number of students attending each high school ranged from 482 to 3,141 (M = 1,349; SD = 672).
A mean of 31.66% (SD = 28.64%) of the total school population was minority (range = 1.56% - 93.42% per school) and a mean of 38.54% (SD = 19.51%) was low SES (range = 7 - 75% per school). Schools were randomly assigned to either an intervention (n = 27) or comparison (n = 27) condition.

Recruitment. To recruit potential participants for the CARS study, school staff members (typically a school counselor, administrator, or special education teacher) were asked to identify at least 25 students who met the following initial criteria: (a) would be attending 9th, 10th, or 11th grade during Year 1 of the study (2011-2012 academic year) and (b) exhibited serious social, emotional, and/or behavioral problems. Nomination of students was not limited to those who were formally identified with an emotional disturbance (ED), but was open to any student who exhibited serious emotional or behavioral problems, regardless of special education label or classification. The school liaison contacted parents of potential participants first to obtain permission for CARS staff to contact them and provide more information about the project. Once permission was obtained, CARS staff met with interested parents and students to secure parental consent and student assent for eligibility screening and potential participation. A total of 857 families agreed to screening.

Eligibility screening. Students were screened to assure that they had significant problems in social, emotional, or behavioral functioning. Standardized assessments were completed by each student, his/her parent or legal guardian, and a school teacher or staff member who knew him/her well. Impairment in social, emotional, or behavioral functioning was indicated by (a) a *T*-score of 60 or higher on the externalizing and/or internalizing composite of the Behavior Assessment System for Children, Second Edition-Teacher or Parent Version (BASC-2; Reynolds & Kamphaus, 2004), indicating "at-risk" status; (b) a *T*-score of 60 or higher on the Mutidimensional Anxiety Scale for Children (MASC; March, 1998), which is one standard deviation above the mean and indicates above average anxiety symptoms; or (c) a *T*-score of 60 or higher on the Reynolds Adolescent Depression Scale, Second Edition (RADS-2;

Reynolds, 2002), which is one standard deviation above the mean and indicates symptoms of depression.

In addition, students were required to demonstrate impairment in school functioning by exhibiting any two of the following: (a) four or more office discipline referrals/behavioral infractions across the semester prior to enrollment or five or more in any month of the current semester, (b) five or more absences (other than illness) or tardies to class in any month of the current or previous semester, (c) two or more in- or out-of-school suspensions in the current academic year, or (d) at least one Fs or two Ds in any core academic subject in one of two most recent grading periods. Previous semester performance was considered because screening began during the summer.

Students with Autism Spectrum Disorder (ASD) were excluded. In addition, students with an IQ score below 75 were also excluded to assure understanding of concepts in some of the interventions (e.g., cognitive behavior therapy). Finally, students had to have at least one parent/guardian who could speak English fluently in order to complete assessments.

Student demographic characteristics. A total of 647 participants met eligibility criteria and had parental consent to participate in the larger CARS study. The sample was 66.50% male (n = 430) and 33.50% female (n = 217). Of the total sample, 49% (n = 317) had a special education label, while the remaining 51% of students (n = 330) had no label. Across the sample, 24% (n = 156) were classified with a specific learning disability (SLD), 12% (n = 80) with an ED, 9% (n = 60) with another health impairment (OHI), and 3% as not available/other (n = 21; e.g., dropped out or moved before all demographic information was obtained; identified with a traumatic brain injury [TBI], speech or language impairment [SLI], or intellectual disability [ID, CARS screening indicated IQ above 75]).

In order to answer the research questions, participants were sorted into one of three behavioral symptom categories: high levels of externalizing symptoms, high levels of internalizing symptoms, or high levels of comorbid externalizing and internalizing symptoms. Presence of externalizing symptoms was based on scores from the externalizing composite of the parent BASC-2, where *T*-scores of 60 and above indicate risk for behavioral problems. Similarly, presence of internalizing symptoms was indicated by *T*-scores of 60 and above on the self-reported MASC (total score) or RADS-2 (total score).

Parent report of externalizing problems was examined, as opposed to teacher report, because it is believed that parents are most likely to have knowledge about their child's behavior across different contexts. In addition, although assessments were completed by a teacher or staff member who knew the student well, report from one teacher may not accurately portray externalizing problems, particularly for students at the high school level who may see a teacher only one period daily and behavior can vary considerably across different classroom environments. Research indicates that correlations between parent and teacher reports of child behavior problems are consistently low, averaging only .28 (Achenbach, McConaughy, & Howell, 1987; De Los Reyes & Kazdin, 2005). Although parent and teacher reports of problem behaviors tend to be discrepant, Achenbach (2006) points out that each report provides useful but different information about the child's functioning in different contexts. Although one teacher may have knowledge of a student's externalizing symptoms during a single class period, parents have information related to their child's history of externalizing problems outside of school and across different environments. Therefore, a decision was made to examine the parent report of externalizing problems for this study. With regard to internalizing symptoms, research clearly indicates that older children and adolescents are the best informants, as parents and teachers may

have difficulty identifying anxiety or depression if the child does not disclose his or her feelings, or if the child makes efforts to hide symptoms of anxiety (Miller, Martinez, Shumka, & Baker, 2014; Smith, 2007).

In the larger CARS study, eligibility for behavioral impairment due to externalizing difficulties was based on *T*-scores of 60 or higher on teacher or parent reports of the BASC-2. Therefore, a number of students who were eligible for the larger CARS study based on teacher reports of externalizing problems, did not have *T*-scores of 60 or higher on the parent BASC-2, MASC, or RADS-2. These students, who could not be classified into one of the three described categories, were excluded from the analyses in the present study ($n = 171$).

A total of 476 participants were included in the final sample. Based on the standardized measures, 60.29% ($n = 287$) exhibited high levels of externalizing problems only (parent BASC-2 externalizing score ≥ 60, MASC and RADS-2 scores < 60); 14.07% ($n = 67$) reported high levels of internalizing problems only (parent BASC-2 externalizing score < 60, MASC or RADS-2 scores ≥ 60); and 25.63% ($n = 122$) demonstrated high levels of comorbid externalizing and internalizing symptoms (parent BASC-2 externalizing score ≥ 60, MASC or RADS-2 scores ≥ 60). Table 1 displays the full demographic characteristics of the sample.

Measures

Multiple forms of assessment were administered at various time points throughout the CARS study. For the proposed study, the following measures will be examined (also see Table 2).

Youth Risk Behavior Survey (YRBS). Adolescent risky behavior was examined using an adapted version of the self-reported YRBS. The YRBS was developed by the CDC to monitor the six categories of priority health-risk behaviors among youth and young adults: (a)

behaviors that contribute to unintentional injuries and violence, (b) tobacco use, (c) alcohol and other drug use, (d) sexual behaviors related to unintended pregnancy and STIs and HIV infection, (e) unhealthy dietary behaviors, and (f) physical inactivity.

The CDC regularly updates the YRBS standard questionnaire to meet the needs of federal, state, and local health agencies. The standard questionnaire is frequently adapted or modified by individual sites as needed. Although no study has been conducted to assess the validity of all self-reported behaviors that are included on the questionnaire, cognitive and situational factors do not threaten the validity of self-reports of each type of behavior equally (Brener, Billy, & Grady, 2003). Further, the importance of assessing the prevalence of risk behaviors among adolescents necessitates the use of self-report measures (Brener et al., 2003). The CDC has conducted two test-retest reliability studies of the national questionnaire. Results from both studies suggest that the survey is appropriate for secondary students and has adequate test–retest reliability (Brener, Collins, Kann, Warren, & Williams, 1995; Brener et al., 2002). To assess the reliability of the 1999 version, Brener and colleagues (2002) administered the 72-item questionnaire to a sample of 4,619 high school students on two testing occasions, approximately two weeks apart. The authors computed a kappa statistic for the items and compared group prevalence estimates between the two testing occasions. Kappas ranged from 23.6% to 90.5% (M = 60.7%). Overall, students responded consistently over time; however, ten items had kappas below 61% and significantly different prevalence estimates between the two timepoints. The problematic items were revised or deleted from later versions of the questionnaire (Brener et al., 2013).

The 45-item adapted version used for the CARS study asked students to report on risk-taking behaviors related to driving, truancy/violence, physical violence and relationships,

depression/suicidal behavior, smoking/tobacco use, alcohol use, marijuana use, other drug use, sexual behaviors, and exercise/recreation. Students reported on their behavioral and emotional functioning using a multiple-choice format. The sum of the item raw scores were totaled for each subscale, in which higher scores indicate higher presence of risk behaviors. The reliability of this measure was further examined by evaluating the internal consistency of each risk behavior subscale for the CARS sample. Five of the subscales had good internal consistency with Cronbach's alphas ranging from .75 to .83 (Alcohol Use, $\alpha = .75$; Depression/Suicidal Behavior, $\alpha = .77$; Smoking/Tobacco Use, $\alpha = .82$; Sexual Behavior, $\alpha = .82$; and Marijuana Use, $\alpha = .83$). The other five subscales had alphas between .10 and .47, indicating very poor internal consistency (Exercise/Recreation, $\alpha = .10$; Physical Violence and Relationships, $\alpha = .12$; Driving, $\alpha = .21$; Other Drug Use, $\alpha = .45$; and Truancy/Violence, $\alpha = .47$). Table 3 displays the Cronbach's coefficient alphas and mean inter-item correlations of each subscale. For the current study, the problematic subscales were excluded from all analyses. Scores from the Depression/Suicidal Behavior, Smoking/Tobacco Use, Alcohol Use, Marijuana Use, and Sexual Behavior subscales were used to measure self-reported risky behavior among adolescents in the sample.

Behavior Assessment System for Children, Second Edition (BASC-2). The BASC-2 (Reynolds & Kamphaus, 2004) is a norm-referenced behavior rating scale that measures a broad range of emotional and behavioral problems in children and adolescents. Although the adolescent form (ages 12 to 21) was administered to parents, teachers, and students in the CARS RCT, only the Externalizing Problems Composite score from the Parent Rating Scale (PRS) was analyzed in the present study. The 150-item parent version asks parents or legal guardians to rate adolescent behavior using a 4-point scale: 1 (*never*), 2 (*sometimes*), 3 (*often*), and 4 (*almost*

always). The BASC-2-PRS yields four composite scores (i.e., Externalizing Problems, Internalizing Problems, Behavioral Symptoms Index, and Adaptive Skills) and 14 scale scores (Aggression, Anxiety, Attention Problems, Atypicality, Conduct Problems, Depression, Hyperactivity, Somatization, Withdrawal, Activities of Daily Living, Adaptability, Functional Communication, Leadership, and Social Skills). The Externalizing Problems Composite examines the areas of hyperactivity, aggression, and conduct problems. On the BASC-2, *T*-scores of 50 represent an average score with higher scores indicating greater levels of problem behavior. *T*-scores of 60 or above generally indicate students are "at-risk" for developing clinically significant problems, while *T*-scores of 70 or above indicate clinical significance.

The assessment is suitable and normed for assessing the behavior of high school students. Overall, the BASC-2 has strong psychometric properties with internal consistency ranging from .80 to .90, test–retest reliability of .82 across age ranges, long-term stability of .69, and convergent validity at $r = .81$ (Reynolds & Kamphaus, 2004). The Externalizing Problems Composite from the PRS has strong internal consistency ranging from .87 to .94 across the child and adolescent versions (Reynolds & Kamphaus, 2004).

Multidimensional Anxiety Scale for Children (MASC). The MASC (March, 1998) is a 39-item self-report assessment of anxiety-related symptoms in youth ages 8-18. It assesses a broad range of emotional, physical, cognitive, and behavioral symptoms that represent dimensions of childhood anxiety. The scale provides a total score, as well as four main scores for Social Anxiety, Separation Anxiety/Panic, Harm Avoidance, and Physical Symptoms. Students rate their own behavior on a 4-point Likert scale: 0 (*never true about me*), 1 (*rarely true about me*), 2 (*sometimes true about me*), and 3 (*often true about me*). *T*-scores of 65 or above generally indicate a level of symptoms associated with clinical anxiety. The measure has good

psychometric properties with internal consistencies ranging from .74 to .85 and test-retest reliability from .73 to .89 (March, Parker, Sullivan, Stallings, & Conners, 1997; March, Sullivan, & Parker, 1999). For the current study, the total score was used to categorize participants into behavioral symptom groups. For all other analyses, the *T*-scores from the Social Anxiety, Separation Anxiety/Panic, Harm Avoidance, and Physical Symptoms subscales were used to measure the severity of self-reported anxiety symptoms.

Reynolds Adolescent Depression Scale, Second Edition (RADS-2). The purpose of the RADS-2 (Reynolds, 2002) is to identify depressive symptoms in adolescents ranging in age from 11-20 years. The 30-item self-report assessment measures the four basic dimensions of depression: Dysphoric Mood, Anhedonia/Negative Affect, Negative Self-Evaluation, and Somatic Complaints. Students respond to questions about their behavioral symptoms using a 4-point Likert scale: 1 (*almost never*), 2 (*hardly ever*), 3 (*sometimes*), and 4 (*most of the time*). The RADS-2 standard scores provide an indication of the clinical severity of an individual's depressive symptoms. *T*-scores of 60 or above indicate symptoms associated with clinical depression. The scale is widely used and has good reported overall psychometric properties with internal consistency ranging from .92 to .94 and test-retest reliability at .89 (Reynolds, 2002). For the current study, the total score was used to categorize participants into behavioral symptom groups. For all other analyses, the *T*-scores from the Dysphoric Mood, Negative Affect, Negative Self-Evaluation, and Somatic Complaints subscales were used to measure the severity of self-reported depression symptoms.

Student Engagement Instrument (SEI). The SEI (Appleton, Christenson, Kim, & Reschly, 2006) is a 35-item student self-report survey designed to measure self-perceived engagement of middle- and high-school students. The instrument yields a total score as well

scores for six subscales. Three of the subscales measure cognitive engagement (i.e., Control and Relevance of School Work, Future Aspirations and Goals, and Extrinsic Motivation) and the other three subscales measure affective engagement (i.e., Teacher-Student Relationships, Peer Support for Learning, and Family Support for Learning). Students respond to items using a 4-point Likert scale: 1 (*strongly disagree*), 2 (*disagree*), 3 (*agree*), and 4 (*strongly agree*). Total scores are calculated by adding student responses, where higher scores reflect higher rates of school connectedness and engagement. Overall, the SEI has good psychometric properties with internal consistency ranging from .72 to .92 and test-retest reliability from .60 to .62 (Appleton, Christenson, Kim, & Reschly, 2006; Betts, Appleton, Reschly, Christenson, & Huebner, 2010). In addition, validity data indicate that high scores on each subscale are significantly correlated with better academic outcomes (Appleton et al., 2006). For this study, the total score was used to measure overall school engagement among high school students in the sample.

Woodcock Johnson Tests of Achievement, Third Edition (WJ-III). The WJ-III (Woodcock, McGrew, & Mather, 2001) is a battery of tests used to assess student achievement in reading, writing, and mathematics. For the current study, the Broad Reading standard score (i.e., Letter–Word Identification, Reading Fluency, Passage Comprehension subtests), and the Broad Math standard score (i.e., Calculation, Math Fluency, and Applied Problems subtests) were used to measure student academic achievement. The composite standard scores on the WJ-III have a mean of 100 and a standard deviation of 15. Overall, the WJ-III has strong psychometric properties and is widely used, with an internal consistency reliability of .94 for the Broad Reading cluster and .95 for the Broad Math cluster. In terms of validity, the Broad Reading and Broad Math clusters correlate moderately with academic skills measured by the Wechsler

Individual Achievement test (Reading, r = .76; Math, r = .66) and with Kaufman's Test of Educational Achievement, Second Edition (Reading, r = .67; Math, r = .70).

Alabama Parenting Questionnaire (APQ). The APQ (Frick, 1991; Shelton, Frick, & Wootton, 1996) consists of 42 items that assess five parenting constructs that have proven to be important for understanding the causes of conduct problems and delinquency in older children and adolescents: Positive Parenting, Parental Involvement, Inconsistent Discipline, Poor Monitoring/Supervision, and Corporal Punishment. Although the measure has parallel forms for child and parent report, only parent reports were collected during the CARS study. A parent or guardian rated the typical frequency of parenting behaviors using a 5-point Likert scale: 1 (*never*), 2 (*almost never*), 3 (*sometimes*), 4 (*often*), and 5 (*always*). The APQ has adequate reliability and validity, with internal consistency ranging from .54 to .83 (M = .68) and test–retest reliability from .69 to .89 (Essau, Sasagawa, & Frick, 2006; Shelton et al., 1996). For this study, scores from the Parental Involvement, Positive Parenting, and Poor Monitoring/Supervision subscales were used to examine the parent behaviors of participants.

Demographic characteristics. Parents completed a demographic questionnaire about their children and family prior to the start of the CARS project. The form, created for the CARS project, obtained demographic characteristics including child age, ethnicity, gender, service utilization, and family information.

Procedures

Assessments were administered at several time points throughout the CARS project for students in both the treatment and comparison conditions. All assessments were individually administered to students and parents by trained project staff, either in the home or at school. All assessments were completed using teleforms that were sent to the Texas Institute for

Measurement, Evaluation, and Statistics (TIMES) at the University of Houston for entry, storage, and analysis. For the current study, data from selected measures administered during the baseline phase were used.

Data Analysis Plan

Preliminary analyses. Preliminary analyses confirmed that the statistical assumptions of normality and collinearity were met (specific criteria are reported in the results section). Specifically, skewness and kurtosis values, normal probability plots, and scatterplots of dependent measures were examined to check the assumptions of normality. Further, tolerance and variance inflation factor (VIF) were used to check the assumptions of collinearity. The intercorrelations among measures were also examined. In addition, descriptive data were obtained to compare possible differences between groups of students with externalizing, internalizing, or comorbid symptoms. All analyses were conducted using SPSS 24.0 statistical software.

Research question 1. The first research question asked if high school students with emotional and behavioral problems report engaging in different types of health-risk behaviors depending on their behavioral symptomatology or gender. To address this question, a two-way factorial multivariate analysis of variance (MANOVA) was conducted examining the main and interaction effects of the behavioral symptom group (i.e., high externalizing, high internalizing, high externalizing and internalizing) and gender (i.e., male, female) on five types of self-reported risky behavior measured by the YRBS (i.e., Smoking/Tobacco Use, Marijuana Use, Alcohol Use, Sexual Behavior, and Depression/Suicidal Behavior). Univariate analyses of variance (ANOVA) were conducted as follow-up tests to significant MANOVAs. Statistically significant ANOVAs were interpreted through Tukey HSD post hoc pairwise comparisons.

A power analysis for a two-way factorial MANOVA with six groups and five dependent variables was conducted using G*Power3 (Faul, Erdfelder, Lang, & Buchner, 2007). According to this software, a minimum sample size of 105 participants (18 per group) would be necessary in order to conduct a MANOVA for statistical analysis assuming power of .80 and alpha level of .05 with a medium effect size ($f = 0.25$). The smallest subgroup included 26 participants (females with high levels of internalizing symptoms); thus, the current sample was sufficient.

Research question 2. The second research question asked if the relationship between behavioral symptoms and risky behavior is moderated by gender or levels of academic functioning, school engagement, or positive parenting. To answer this question, a two-way factorial multivariate analysis of covariance (MANCOVA) was conducted examining the main and interaction effects of the behavioral symptom group (i.e., high externalizing, high internalizing, high externalizing and internalizing) and gender (i.e., male, female) on five types of self-reported risky behavior measured by the YRBS (i.e., Smoking/Tobacco Use, Marijuana Use, Alcohol Use, Sexual Behavior, and Depression/Suicidal Behavior). To examine the impact of academic achievement, student engagement, and parenting practices on risky behavior, scores from the WJ-III (Broad Reading and Broad Math), SEI (total score), and APQ (Parental Involvement, Positive Parenting, Poor Monitoring/Supervision) were included as covariates.

Prior to conducting the MANCOVA, it was necessary to test the significance of regression to confirm that there was a significant linear relationship between each covariate and the set of dependent variables. Covariates that were not significantly related to the set of dependent variables were not included in the analysis. In order to test for moderating effects, a custom model was built in SPSS that included a main effect for each fixed factor (i.e., Behavioral Symptom Group, Gender), an interaction term between the two categorical fixed

factors (Behavioral Symptom Group × Gender), a main effect for each covariate, a two-way interaction term between the Symptom Group fixed factor and each covariate, and a three-way interaction term between the two fixed factors and each covariate.

Again, a power analysis was conducted using G*Power3 software (Faul et al., 2007). In order to conduct this two-way factorial MANCOVA with 21 possible predictor terms and five dependent variables, a minimum sample size of 145 participants (24 per group) would be necessary for statistical analysis assuming power of .80, an alpha level of .05, and a medium effect size (f = .25). Because smallest subgroup included 26 participants, the current sample was sufficient.

Research question 3. The third research question asked if the relationship between externalizing problems (as measured by the BASC-2-PRS Externalizing Problems Composite) and adolescent risky behavior (as measured by the YRBS) is moderated by symptoms of anxiety (as measured by the MASC) or student gender. In order to answer this question, five separate moderated regression analyses were conducted — one for each of the YRBS subscales examined in the current study (i.e., Smoking/Tobacco Use, Marijuana Use, Alcohol Use, Sexual Behavior, and Depression/Suicidal Behavior). Prior to conducting the analyses, the continuous predictor variables were centered in order to reduce multicollinearity (Aiken & West, 1991). Then, centered predictor variables were used to create multiplicative interaction terms.

The main effects of the six predictor variables (i.e., BASC-2-PRS Externalizing Problems; MASC [Social Anxiety, Separation Anxiety/Panic, Harm Avoidance, Physical Symptoms] and gender) were analyzed. Next, five interaction terms were added to the model to determine if anxiety symptoms or gender moderated the impact of externalizing problems on risky behavior (i.e., BASC-2 Externalizing × gender, BASC-2 Externalizing × Social Anxiety,

BASC-2 Externalizing × Separation/Panic, BASC-2 Externalizing × Harm Avoidance, and BASC-2 Externalizing × Physical Symptoms). Finally, four three-way interaction terms were added to the model to examine possible interaction effects between externalizing problems, anxiety, and gender (i.e., BASC-2 Externalizing × Social Anxiety × gender, BASC-2 Externalizing × Separation/Panic × gender, BASC-2 Externalizing × Harm Avoidance × gender, and BASC-2 Externalizing × Physical Symptoms × gender).

A power analysis for linear multiple regression was conducted using G*Power3 (Faul et al., 2007). An estimated minimum sample size of 139 participants would be necessary in order to conduct a regression analysis with 15 predictors assuming power of .80, an alpha level of .05, and a medium effect size (f = .15). The sample used for this study (N =476) was more than sufficient.

Research question 4. The fourth research question asked if the relationship between externalizing problems (as measured by the BASC-2-PRS Externalizing Problems Composite) and adolescent risky behavior (as measured by the YRBS) is moderated by symptoms of depression (as measured by the RADS-2) or student gender. Analyses were similar to those conducted for the third research question, with five separate moderated regression analyses conducted, one for each of the YRBS subscales examined in this study (i.e., Smoking/Tobacco Use, Marijuana Use, Alcohol Use, Sexual Behavior, and Depression/Suicidal Behavior). Again, the continuous predictor variables were centered and used to create multiplicative interaction terms (Aiken & West, 1991).

The main effects of the six predictor variables (i.e., BASC-2-PRS Externalizing Problems; RADS-2 [Dysphoric Mood, Anhedonia/Negative Affect, Negative Self-Evaluation, Somatic Complaints]; and gender) were analyzed. Then, five interaction terms were added to the

model to determine if symptoms of depression or gender moderated the impact of externalizing problems on risky behavior (i.e., BASC-2 Externalizing × gender, BASC-2 Externalizing × Dysphoric Mood, BASC-2 Externalizing × Negative Affect, BASC-2 Externalizing × Negative Self-Evaluation, and BASC-2 Externalizing × Somatic Complaints). Finally, four three-way interaction terms were added to the model to examine possible interaction effects between externalizing problems, depression, and gender (i.e., BASC-2 Externalizing × Dysphoric Mood × gender, BASC-2 Externalizing × Negative Affect × gender, BASC-2 Externalizing × Negative Self-Evaluation × gender, and BASC-2 Externalizing × Somatic Complaints × gender).

As established in the power analysis conducted for research question three, a sample size of 139 participants would be necessary in order to conduct a regression analysis with 15 predictors assuming power of .80, an alpha level of .05, and a medium effect size ($f = .15$). The sample used for this study ($N = 476$) was more than sufficient.

Chapter 4

Results

Preliminary Analyses

Prior to conducting the main analyses, a descriptive analysis of all measures used in the current study was conducted to compare possible differences between genders or between groups of students with externalizing, internalizing, or comorbid symptoms. Table 4 displays the means and standard deviations by behavioral symptom group (i.e., High Externalizing, High Internalizing, High Externalizing and Internalizing), while Table 5 displays the means and standard deviations of all measures by student gender. In addition, Table 6 displays the means and standard deviations of all measures by symptom group and gender.

Preliminary analyses were conducted to examine the statistical assumptions of normality and correlation matrices were also calculated to explore intercorrelations among the variables. Univariate normality was assessed for all analyses using the skewness and kurtosis ranges suggested by Lomax (2001). Initially, skewness and kurtosis values for the YRBS Depression/Suicidal Behavior variable did not fall within the acceptable -2 to +2 range (skewness = 2.18, kurtosis = 4.38). This variable was transformed in SPSS using the square root function. After transformation, final skewness (range = -.52 to 1.23) and kurtosis values (range = -1.41 to 1.48) for all observed variables fell within the recommended -2 to +2 range. See Tables 7 and 8 for correlations and a complete list of skewness and kurtosis values for all variables.

MANOVA and MANCOVA Analyses

Prior to conducting analyses for the first two research questions, the data were evaluated with regard to meeting the statistical assumption of multivariate normality necessary for

MANOVA. Univariate normality was established with skewness and kurtosis values for the dependent variables that were within acceptable ranges (between -2 and +2; Lomax, 2001). Also, the normal probability plots for the dependent measures showed a relatively straight line, indicating no substantial departures from normality. Bivariate normality was assessed by examining the scatterplot of each pair of dependent variables. The scatterplots appeared relatively elliptical in shape, which supports bivariate normality according to Stevens (2009). Based on the univariate and bivariate normality evidence, the assumption of multivariate normality necessary for MANOVA was satisfied.

Research question 1. The first research question asked if high school students with emotional and behavioral problems report engaging in different types of health-risk behaviors depending on their behavioral symptomatology or gender. A two-way factorial MANOVA was conducted examining the main and interaction effects of behavioral symptom group (i.e., High Externalizing, High Internalizing, High Externalizing and Internalizing) and gender (i.e., male, female) on five types of risky behavior measured by the YRBS (i.e., Smoking/Tobacco Use, Marijuana Use, Alcohol Use, Sexual Behavior, and Depression/Suicidal Behavior). Significant multivariate effects were found for the main effects of Symptom Group, Wilks' $\lambda = .754$, $F(10, 710) = 10.746$, $p < .001$, partial $\eta^2 = .13$, and Gender, Wilks' $\lambda = .848$, $F(5, 355) = 12.732$, $p < .001$, partial $\eta^2 = .15$. The partial eta squared values indicated large effect sizes (Cohen, 1988) with 13% of the variance in risky behavior attributable to the type of behavioral symptoms, while 15% of the variance could be explained by student gender. The interaction of Symptom Group and Gender was not found to be significant, Wilks' $\lambda = .952$, $F(10, 710) = 1.757$, $p = .065$, partial $\eta^2 = .02$. The significant main effects, in the absence of a significant interaction, indicated that the differences between males and females were consistent across the three

behavioral symptom groups. Similarly, the differences between behavioral symptom groups were consistent for males and females. Table 9 displays significance test results of the two-way MANOVA. Five univariate ANOVAs (one for each dependent variable) were conducted as follow-up tests for each significant multivariate main effect.

Main effects of behavioral symptom group. Univariate follow-up ANOVAs showed significant behavioral symptom group main effects for Smoking/Tobacco Use, $F(2, 359) = 5.004$, $p = .007$, partial $\eta^2 = .03$; Marijuana Use, $F(2, 359) = 4.131$, $p = .017$, partial $\eta^2 = .02$; Sexual Behavior, $F(2, 359) = 7.589$, $p = .001$, partial $\eta^2 = .04$; and Depression/Suicidal Behavior, $F(2, 359) = 44.423$, $p < .001$, partial $\eta^2 = .20$. A large effect size was found for the significant behavioral symptom group main effect for depression/suicidal behavior, with 20% of the variance in suicidal behavior explained by the type of adolescent behavioral symptoms. However, the partial eta squared values indicated that behavioral symptom type accounted for a small amount of the variance in tobacco use, marijuana use, and sexual behavior. The small effect sizes suggest that there are factors other than type of behavioral symptoms that were not considered in this analysis (e.g., family income, academic achievement, parent engagement) that may contribute more to the variance in tobacco use, marijuana use, and sexual behavior. Significant group differences were not found on the Alcohol Use subscale.

Tukey post hoc pairwise comparisons were conducted for the four dependent measures with a significant ANOVA to determine how the means of the three symptom groups differed. Adolescents in the comorbid group ($M = 6.86$) reported a significantly higher level of smoking and tobacco use than those with internalizing problems alone ($M = 3.12$, $p = .011$). No significant differences in tobacco use behavior were found between the comorbid group and externalizing group, or between the externalizing group and internalizing group. Similarly,

adolescents in the comorbid group ($M = 4.32$) reported significantly a greater level of marijuana use than those in the internalizing group ($M = 2.19$, $p = .034$). Again, no significant differences in marijuana use were found between the comorbid group and externalizing group, or between the externalizing group and internalizing group. With regard to sexual behavior, students in the comorbid group ($M = 6.02$) reported significantly higher levels of risky behavior as compared to students in the internalizing group ($M = 2.65$, $p = .001$). In addition, students in the externalizing group ($M = 5.78$) reported higher levels of risky sexual behavior than students in the internalizing group ($p < .001$), but no significant differences were found between students comorbid and externalizing groups. Last, significant differences were found between all three groups in reports of depression/suicidal behavior. Adolescents in the comorbid group reported the highest level ($M = .81$), which was significantly different than reports from the internalizing group ($M = .61$, $p = .015$) and the externalizing group ($M = .23$, $p < .001$). Reports of depression/suicidal behavior were also significantly different between the internalizing group and externalizing group ($p < .001$). Table 10 displays the means, standard deviations, and significance test results of the symptom group differences on each type of risky behavior.

Main effects of gender. Univariate follow-up ANOVAs showed significant gender main effects for Smoking/Tobacco Use, $F(1, 359) = 4.013$, $p = .046$, partial $\eta^2 = .01$, and Depression/Suicidal Behavior, $F(1, 359) = 55.097$, $p < .001$, partial $\eta^2 = .13$. Specifically, males ($M = 5.95$) reported significantly more smoking/tobacco use behaviors than females ($M = 4.21$). In contrast, females ($M = .791$) reported significantly more depression/suicidal behaviors than males ($M = .311$). A large effect size was found for the gender main effect for depression/suicidal behavior, with 13% of the variance in suicidal behavior explained by student gender. Student gender accounted for only 1% of the variance in smoking/tobacco use. Again,

the small effect size may suggest that there are additional factors that may be attributed to a greater amount of variance in tobacco use. Significant gender differences were not found for Alcohol Use, Marijuana Use, or Sexual Behavior. Table 11 displays the means, standard deviations, and significance test results of the gender differences on each type of risky behavior.

Research question 2. The second research question asked if the relationship between behavioral symptoms and risky behavior is moderated by gender or levels of academic functioning, school engagement, or positive parenting. A two-way factorial MANCOVA examined main and interaction effects of behavioral symptom group (i.e., high externalizing, high internalizing, high externalizing and internalizing) and gender (i.e., male, female) on five types of risky behavior measured by the YRBS (i.e., Smoking/Tobacco Use, Marijuana Use, Alcohol Use, Sexual Behavior, and Depression/Suicidal Behavior). To examine the impact of academic achievement, student engagement, and parenting practices on risky behavior, scores from the WJ-III (Broad Reading and Broad Math), SEI (total score), and APQ (Parental Involvement, Positive Parenting, Poor Monitoring/Supervision) were included as covariates. In order to test for moderating effects, a custom model was built in SPSS.

As previously described, preliminary checks were conducted to ensure that there were no violations of the assumptions of normality. When conducting a MANCOVA, covariates should not be substantially correlated with each other (e.g., $r > .80$; Stevens, 2009). Correlations between covariates did not exceed .65 (see Table 7), making MANCOVA an appropriate statistical method (Stevens, 2009; Tabachnick & Fidell, 2013). Prior to conducting the MANCOVA, it was also necessary to test the significance of regression to confirm that there was a significant linear relationship between each covariate and the set of dependent variables. Out of the six covariates, only APQ Poor Monitoring/Supervision, Wilks' $\lambda = .837$, $F(5, 258) =$

10.037, $p < .001$, partial $\eta^2 = .16$, and the SEI total score, Wilks' $\lambda = .909$, $F(5, 258) = 5.182$, $p < .001$, partial $\eta^2 = .09$, were significantly related to the set of dependent variables. Table 12 displays the multivariate *F*-test results for all covariates. The covariates that were not significantly related to the dependent variables were excluded from the MANCOVA analysis (i.e., WJ-III Broad Reading, WJ-III Broad Math, APQ Parent Involvement, and APQ Positive Parenting). Thus, the custom model included a main effect for each fixed factor (Symptom Group, Gender), an interaction term between the two categorical fixed factors (Symptom Group × Gender), a main effect for each covariate (SEI total score, APQ Poor Monitoring/Supervision), a two-way interaction term between the Symptom Group fixed factor and each covariate (Symptom Group × SEI total score, Symptom Group × APQ Poor Monitoring/Supervision), and a three-way interaction term between both fixed factors and each covariate (Symptom Group × Gender × SEI total score, Symptom Group × Gender × APQ Poor Monitoring/Supervision).

Results showed that the main and interaction effects of behavioral symptoms and gender were not significant in this model. The main effect of the APQ Poor Monitoring/Supervision variable was found to be significant, Wilks' $\lambda = .92$, $F(5, 325) = 5.77$, $p < .001$, partial $\eta^2 = .08$, as well as the main effect of the SEI total score, Wilks' $\lambda = .94$, $F(5, 325) = 4.24$, $p = .001$, partial $\eta^2 = .06$. Of particular importance, a significant multivariate effect was found for the Symptom Group × APQ Poor Monitoring/Supervision interaction term, indicating that the differences in risky behavior between the behavioral symptom groups was different across levels of parent monitoring and supervision, Wilks' $\lambda = .94$, $F(10, 650) = 2.18$, $p = .02$, partial $\eta^2 = .03$. The Symptom Group × SEI Total interaction was not found to be significant, suggesting that the differences in risky behavior between the behavioral symptom groups was consistent across levels of school engagement, Wilks' $\lambda = .97$, $F(10, 650) = 1.18$, $p = .30$, partial $\eta^2 = .02$. Both

three-way interactions were also not significant, indicating that levels of school engagement and parent monitoring were consistent across males and females in each behavioral symptom group. Table 13 displays the complete multivariate *F*-test results.

Interaction effect of behavioral symptoms and parent monitoring. In order to interpret the significant interaction between the behavioral symptom groups and levels of parent monitoring, the continuous APQ Poor Monitoring/Supervision variable was nominalized and assessed through a two-way factorial MANOVA. A categorical variable was created by recoding APQ Poor Monitoring/Supervision scores into two groups, those that fell above the mean and those that fell below the mean ($M = 20.53$). Higher scores on this subscale indicate poor parent monitoring and supervision, while lower scores indicate greater monitoring and supervision. Therefore, the scores that fell above the mean were categorized as Low Parent Monitoring ($n = 175$), while scores that fell below the mean were categorized as High Parent Monitoring ($n = 188$).

The two-way MANOVA examined the main and interaction effects of behavioral symptom group (i.e., High Externalizing, High Internalizing, High Externalizing and Internalizing) and level of parent monitoring/supervision (i.e., High Parent Monitoring, Low Parent Monitoring) on five types of risky behavior measured by the YRBS (i.e., Smoking/Tobacco Use, Marijuana Use, Alcohol Use, Sexual Behavior, and Depression/Suicidal Behavior). As expected, results showed a significant interaction between behavioral symptom groups and levels of parent monitoring and supervision, Wilks' $\lambda = .95$, $F(10, 706) = 1.93$, $p = .04$, partial $\eta^2 = .03$. Five univariate ANOVAs (one for each dependent variable) were conducted as follow-up tests for the significant MANOVA. Table 14 displays the means,

standard deviations, and significance test results for each risky behavior subscale across the symptom groups and levels of parent monitoring.

Univariate follow-up ANOVAs showed a significant interaction between behavioral symptom groups and levels of parent monitoring on Depression/Suicidal Behavior, $F(2, 357) = 6.85$, $p = .001$, partial $\eta^2 = .04$. Significant group differences were not found on any of the other YRBS subscales. The significant interaction effect indicates that the symptom group differences in Depression/Suicidal Behavior were not consistent between students with high levels of parent monitoring compared to those with low levels of parent monitoring. Figure 1 displays the interaction of the means for symptom group and level of parent monitoring. Contrast analyses revealed that the difference between adolescents with high levels of parent monitoring and low levels of parent monitoring in the internalizing group was significantly different than the difference between those in the comorbid group ($p = .02$) and externalizing group ($p < .001$). Among students with high levels of internalizing problems only, those with less parent monitoring and supervision reported significantly higher levels of Depression/Suicidal Behavior ($M = 1.02$) compared to those with high levels of parent monitoring and supervision ($M = .38$, $p < .001$).

Regression Analyses

For the regression analyses, the assumption of normality of the data was met based on analysis of normal probability plots, scatterplots of the dependent variables, and adequate skewness and kurtosis values (within -2 and 2; see Tables 4 and 5). The assumption of collinearity was tested through the use of Tolerance and Variance Inflation Factor (VIF) criteria. All collinearity diagnostics were acceptable based on Studenmund's (2001) recommendations of having Tolerance values greater than .20 and VIF values less than 5.

Research question 3. The third research question asked if the relationship between externalizing problems and adolescent risky behavior is moderated by symptoms of anxiety. Five separate moderated regression analyses were conducted — one for each of the YRBS subscales examined as the dependent variable (i.e., Smoking/Tobacco Use, Marijuana Use, Alcohol Use, Sexual Behavior, and Depression/Suicidal Behavior). For each moderated regression analysis, three models were examined. In Model 1, externalizing symptoms (measured by BASC-2-PRS Externalizing Problems), anxiety symptoms (measured by MASC subscales – Physical Symptoms, Harm Avoidance, Social Anxiety, and Separation Anxiety/Panic), and gender were examined as predictors. In Model 2, two-way interaction terms were added to the model to determine if anxiety symptoms or gender moderated the impact of externalizing problems on risky behavior. In Model 3, three-way interaction terms were added in order to examine possible interaction effects between externalizing symptoms, anxiety, and gender.

Smoking/tobacco use. The first regression model, with externalizing symptoms, anxiety symptoms, and student gender as predictors, explained a significant amount of variance (R^2 = .14, $p < .001$) in smoking/tobacco use among adolescents. BASC-2 Externalizing Problems (β = .13, p = .003), MASC Physical Symptoms (β = .28, $p < .001$), MASC Harm Avoidance (β = -.18, $p < .001$), MASC Social Anxiety (β = -.11, p = .049), and MASC Separation/Panic (β = -.16, p = .003) were significantly related to self-reported smoking and tobacco use. Gender was not found to be a significant predictor (β = .09, p = .056). Externalizing problems and physical symptoms were both positively related to smoking and tobacco use, whereas harm avoidance, social anxiety, and separation/panic were negatively related to smoking and tobacco use.

Adding the interaction terms as predictors in Models 2 and 3 did not significantly increase the percentage of variance explained over the first model. The interactions terms were not significant in Models 2 or 3, indicating that anxiety symptoms and gender did not moderate the relationship between externalizing problems and smoking/tobacco use among adolescents. Table 15 displays the full results of the moderated regression analysis of externalizing symptoms and anxiety predicting smoking/tobacco use.

Alcohol use. The first regression model, with externalizing symptoms, anxiety symptoms, and student gender as predictors, explained a significant amount of variance (R^2 = .10, $p < .001$) in alcohol use among adolescents. MASC Physical Symptoms ($\beta = .25$, $p < .001$), MASC Harm Avoidance ($\beta = -.14$, $p = .007$), MASC Social Anxiety ($\beta = -.16$, $p = .007$), and MASC Separation/Panic ($\beta = -.12$, $p = .035$) were significantly related to self-reported alcohol use. Externalizing problems ($\beta = .03$, $p = .514$) and gender ($\beta = -.05$, $p = .274$) were not significantly related to alcohol use. Regression weights indicated that physical symptoms were positively related to alcohol use, whereas harm avoidance, social anxiety, and separation/panic were negatively related alcohol use.

Adding the interaction terms as predictors in Models 2 and 3 did not significantly increase the percentage of variance explained over the first model. The interactions terms were not significant in Models 2 or 3, suggesting that anxiety symptoms and gender did not moderate the relationship between externalizing problems and alcohol use among adolescents. Table 16 displays the full results of the moderated regression analysis of externalizing symptoms and anxiety predicting alcohol use.

Marijuana use. The first regression model, with externalizing symptoms, anxiety symptoms, and student gender as predictors, explained a significant amount of variance (R^2 =

.10, $p < .001$) in marijuana use among adolescents. MASC Physical Symptoms had a positive significant relationship with self-reported marijuana use ($\beta = .26$, $p < .001$). MASC Social Anxiety had a significant negative relationship with marijuana use ($\beta = -.20$, $p = .002$). Regression weights for externalizing problems, gender, harm avoidance, and separation anxiety were not significant.

Adding the interaction terms as predictors in Models 2 and 3 did not significantly increase the percentage of variance explained over the first model. The interactions terms were not significant in Models 2 or 3, suggesting that anxiety symptoms and gender did not moderate the relationship between externalizing problems and marijuana use among adolescents. Table 17 displays the full results of the moderated regression analysis of externalizing symptoms and anxiety predicting marijuana use.

Sexual behavior. The first regression model, with externalizing symptoms, anxiety symptoms, and student gender as predictors, explained a significant amount of variance ($R^2 = .07$, $p < .001$) in risky sexual behavior among adolescents. BASC-2 Externalizing Problems ($\beta = .11$, $p = .04$), MASC Physical Symptoms ($\beta = .15$, $p = .008$), and MASC Social Anxiety ($\beta = -.16$, $p = .013$) were significantly related to self-reported sexual behavior. Gender, harm avoidance, and separation anxiety/panic were not found to be significant predictors. Externalizing problems and physical symptoms were both positively related to sexual behavior, whereas social anxiety was negatively related to risky sexual behavior.

Adding the interaction terms as predictors in Models 2 and 3 did not significantly increase the percentage of variance explained over the first model. The interactions terms were not significant in Models 2 or 3, indicating that anxiety symptoms and gender did not moderate the relationship between externalizing problems and sexual behavior among adolescents. Table

18 displays the full results of the moderated regression analysis of externalizing symptoms and anxiety predicting sexual behavior.

Depression/suicidal behavior. The first regression model, with externalizing symptoms, anxiety symptoms, and student gender as predictors, explained a significant amount of variance ($R^2 = .26$, $p < .001$) in self-reported depression/suicidal behavior among adolescents. Gender ($\beta = -.33$, $p < .001$), MASC Physical Symptoms ($\beta = .25$, $p < .001$), MASC Harm Avoidance ($\beta = -.11$, $p = .026$), and MASC Social Anxiety ($\beta = .16$, $p = .004$) were significantly related to depression/suicidal behavior. Regression weights for externalizing problems and separation anxiety/panic were not significant. Physical symptoms and social anxiety were both positively related to depression/suicidal behavior, whereas harm avoidance and male gender were negatively related to depression/suicidal behavior.

Model 2 also explained a significant amount of variance ($R^2 = .28$, $p < .001$) in self-reported depression/suicidal behavior among adolescents. The addition of the two-way interaction terms in the second regression model resulted in a 2% increase in the percentage of variance explained over the first model, which was not significant ($\Delta R^2 = .02$, $p = .13$). The interaction of externalizing problems and separation anxiety/panic was significant ($\beta = .13$, $p = .026$), suggesting that separation anxiety moderates the relationship between externalizing problems and suicidal behavior. Given that the stepwise increase was not significant, it is possible that this result could be a Type 1 error. Thus, the second model should be interpreted with caution as previous research in this area is limited and this was an exploratory study. As illustrated by the plot of simple slopes shown in Figure 2, the relationship between externalizing symptoms and suicidal behavior was dependent on level of separation anxiety symptoms. Overall, adolescents with higher externalizing problems reported higher levels of

depression/suicidal behavior. However, among adolescents with higher levels of externalizing problems, those with lower levels of separation anxiety reported higher rates of depression/suicidal behavior compared to those with high levels of separation anxiety. Conversely, students with low levels of externalizing problems and high levels of separation anxiety reported lower rates of depression/suicidal behavior compared to students with low levels of externalizing problems and low levels of separation anxiety.

Adding the three-way interaction terms as predictors in Model 3 did not significantly increase the percentage of variance explained and none of the interactions terms were significant in this model. Therefore, it was concluded that that there were no three-way interaction effects between externalizing problems, anxiety symptoms, and gender. Table 19 displays the full results of the moderated regression analysis of externalizing symptoms and anxiety predicting depression/suicidal behavior.

Research question 4. The fourth research question asked if the relationship between externalizing problems and adolescent risky behavior is moderated by symptoms of depression. A separate moderated regression analysis was conducted for each YRBS subscale examined in the current study (i.e., Smoking/Tobacco Use, Marijuana Use, Alcohol Use, Sexual Behavior, and Depression/Suicidal Behavior). In a similar process to the previous research question, three models were examined for each moderated regression analysis. In Model 1, externalizing symptoms (measured by BASC-2-PRS Externalizing Problems), depression symptoms (measured by RADS-2 subscales – Dysphoric Mood, Anhedonia/Negative Affect, Negative Self-Evaluation, and Somatic Complaints), and gender were examined as predictors. In Model 2, two-way interaction terms were added to the model to determine if symptoms of depression or gender moderated the impact of externalizing problems on risky behavior. In Model 3, three-

way interaction terms were added in order to examine possible interaction effects between externalizing symptoms, depression, and student gender.

Smoking/tobacco use. The first regression model, with externalizing symptoms, depression symptoms, and student gender as predictors, explained a significant amount of variance ($R^2 = .09$, $p < .001$) in smoking/tobacco use among adolescents. BASC-2 Externalizing Problems ($\beta = .15$, $p = .001$), Gender ($\beta = .11$, $p = .014$), RADS-2 Dysphoric Mood ($\beta = -.14$, $p < .044$), RADS-2 Negative Affect ($\beta = .15$, $p = .003$), and RADS-2 Somatic Complaints ($\beta = .28$, $p < .001$) were significantly related to self-reported smoking and tobacco use. RADS-2 Negative Self-Evaluation was not a significant predictor ($\beta = -.04$, $p = .62$). Externalizing problems, negative affect, somatic complaints, and male gender were positively related to smoking and tobacco use, whereas dysphoric mood was negatively related to smoking and tobacco use.

Model 2 also explained a significant amount of variance ($R^2 = .10$, $p < .001$) in self-reported smoking/tobacco use among adolescents. The addition of the two-way interaction terms in the second regression model did not result in a significant increase in the percentage of variance explained over the first model ($\Delta R^2 = .01$, $p = .41$). The two-way interaction terms in this model were not significant.

Model 3 explained a significant amount of variance ($R^2 = .12$, $p < .001$) in self-reported smoking/tobacco use among adolescents. The addition of the three-way interaction terms in the third regression model resulted in a 2% increase in the percentage of variance explained over the first model, but this was not significant ($\Delta R^2 = .02$, $p = .06$). Again, it is possible that significant predictors in Model 3 could be the result of Type 1 error, so results should be interpreted with caution as they were an exploratory analysis. Regression weights for BASC-2

Externalizing Problems (β = .09, p = .61) and RADS-2 Dysphoric Mood (β = -.12, p = .09) were no longer significant in this model. Gender (β = .09, p = .047), RADS-2 Negative Affect (β = .17, p = .001), and RADS-2 Somatic Complaints (β = .27, p < .001) remained significantly related to self-reported smoking and tobacco use. In addition, the interaction of externalizing problems and somatic complaints was significant (β = .49, p = .017), as well as a three-way interaction between externalizing problems, somatic complaints, and gender (β = -.52, p = .012). Table 20 displays the full results of the moderated regression analysis of externalizing symptoms and depression predicting smoking/tobacco use.

The significant interaction of externalizing problems and somatic complaints suggests that somatic complains moderate the relationship between externalizing problems and tobacco use. As shown on the plot of simple slopes in Figure 3, the relationship between externalizing symptoms and tobacco use was dependent upon level of somatic complaint symptoms. Among adolescents with higher levels of externalizing problems, those with higher levels of somatic complaints reported higher rates of tobacco use compared to those with low levels of somatic complaints. In contrast, adolescents with low levels of externalizing problems and high levels of somatic complaints reported lower rates of tobacco use compared to those with low levels of externalizing problems and low levels of somatic complaints.

The significant three-way interaction between externalizing problems, somatic complaints, and gender suggests that the differences in levels of somatic complaints across levels of externalizing problems was not consistent across genders. As can be seen in Tables 21 and 22, further inspection of this three-way interaction revealed that the two-way interaction between externalizing problems and somatic complaints was significant for females (β = .24, p = .025), but not for males (β = -.13, p = .108). Figure 4 shows the plot of simple slopes for the

interaction of externalizing problems and somatic complaints predicting tobacco use among females. Among females with higher levels of externalizing problems, those with higher levels of somatic complaints reported higher rates of tobacco use compared to those with low levels of somatic complaints. This was not so among females with low levels of externalizing problems, indicating that somatic complaints moderate the relationship between externalizing problem and tobacco use among female adolescents. As illustrated in Figure 5, the relationship between externalizing problems and tobacco use was consistent across levels of somatic complaint symptoms for males. Therefore, it can be concluded that somatic complaints moderate the impact of externalizing problems on tobacco use for females, but not for males.

Alcohol use. The first regression model, with externalizing symptoms, depression symptoms, and student gender as predictors, explained a significant amount of variance (R^2 = .04, p = .006) in alcohol use among adolescents. RADS-2 Somatic Complaints was the only significant predictor in the model (β = .16, p = .02) and was positively related to alcohol use.

Adding the interaction terms as predictors in Models 2 and 3 did not significantly increase the percentage of variance explained over the first model. The interactions terms were not significant in Models 2 or 3, suggesting that depression symptoms and gender did not moderate the relationship between externalizing problems and alcohol use among adolescents. The variable for somatic complaints was the only significant predictor of alcohol use across all three models and retained its significance in Model 2 (β = .17, p = .014) and Model 3 (β = .16, p = .018). Table 23 displays the full results of the moderated regression analysis of externalizing symptoms and depression predicting alcohol use.

Marijuana use. The first regression model, with externalizing symptoms, depression symptoms, and student gender as predictors, explained a significant amount of variance (R^2 =

.05, p =.003) in marijuana use among adolescents. BASC-2 Externalizing Problems (β = .11, p = .045), male gender (β = .12, p = .022) and RADS-2 Somatic Complaints (β = .21, p = .004) had a positive and significant relationship with self-reported marijuana use. Regression weights for dysphoric mood, negative affect, and negative self-evaluation were not significant.

Adding the interaction terms as predictors in Models 2 and 3 did not significantly increase the percentage of variance explained over the first model. The interactions terms were not significant in Models 2 or 3, suggesting that neither symptoms of depression nor gender moderate the relationship between externalizing problems and marijuana use among adolescents. Table 24 displays the full results of the moderated regression analysis of externalizing symptoms and depression predicting marijuana use.

Sexual behavior. The first regression model, with externalizing symptoms, depression symptoms, and student gender as predictors, explained a significant amount of variance (R^2 = .04, p = .01) in risky sexual behavior among adolescents. BASC-2 Externalizing Problems (β = .15, p = .005) and RADS-2 Somatic Complaints (β = .19, p = .007) were both positively related to self-reported sexual behavior. Regression weights for gender, dysphoric mood, negative affect, and negative self-evaluation were not significant.

Adding the interaction terms as predictors in Models 2 and 3 did not significantly increase the percentage of variance explained over the first model. The interactions terms were not significant in Models 2 or 3, indicating that depression symptoms and gender did not moderate the relationship between externalizing problems and sexual behavior among adolescents. Table 25 displays the full results of the moderated regression analysis of externalizing symptoms and depression predicting sexual behavior.

Depression/suicidal behavior. The first step of the regression model, with externalizing symptoms, depression symptoms, and student gender as predictors, explained a significant amount of variance ($R^2 = .39$, $p < .001$) in self-reported depression/suicidal behavior among adolescents. Female gender ($\beta = -.28$, $p < .001$), RADS-2 Dysphoric Mood ($\beta = .30$, $p < .001$), RADS-2 Negative Affect ($\beta = .15$, $p = .001$), and RADS-2 Negative Self-Evaluation ($\beta = .16$, $p = .013$) were significantly related to depression/suicidal behavior. Dysphoric mood, negative affect, and negative self-evaluation were positively related to suicidal behavior. Regression weights for externalizing problems and somatic complaints were not significant.

Model 2 also explained a significant amount of variance ($R^2 = .40$, $p < .001$) in self-reported depression/suicidal behavior among adolescents. The addition of the two-way interaction terms in the second regression model resulted in a 1% increase in the percentage of variance explained over the first model, which was not significant ($\Delta R^2 = .01$, $p = .21$). Similar to the procedure for interpreting previous regression analyses, the significant predictors in Model 2 were explored with caution. The interaction of externalizing problems and somatic complaints was significant ($\beta = -.12$, $p = .026$), suggesting that somatic complaints moderated the relationship between externalizing problems and suicidal behavior. As illustrated by the plot of simple slopes shown in Figure 6, the relationship between externalizing problems and suicidal behavior was dependent upon level of somatic complaint symptoms. Among adolescents with higher levels of externalizing problems, those with lower levels of somatic complaints reported higher rates of depression/suicidal behavior compared to those with high levels of somatic complaints. Conversely, students with low levels of externalizing problems and high levels of somatic complaints reported higher rates of suicidal behavior compared to students with low levels of externalizing problems and low levels of somatic complaints.

The addition of the three-way interaction terms as predictors in Model 3 did not significantly increase the percentage of variance explained and none of the interactions terms were significant in this model. Therefore, it was concluded that that there were no three-way interaction effects between externalizing problems, depression symptoms, and gender. Table 26 displays the full results of the moderated regression analysis of externalizing symptoms and symptoms of depression predicting suicidal behavior.

Chapter 5

Discussion

The current study explored various types of risky behavior (i.e., smoking/tobacco use, alcohol use, marijuana use, sexual behavior, and depression/suicidal behavior) among a sample of high school students with emotional and behavioral problems. First, differences in self-reported risk-taking behaviors were examined among adolescents with different types of behavioral symptoms (high levels of externalizing, high levels of internalizing, and high levels of comorbid externalizing and internalizing symptoms). Further, the interaction effects of behavioral symptoms with levels of academic functioning, school engagement, and positive parenting were examined to see if those factors protected adolescents from risky behavior consistently across the three symptom groups (high internalizing, high externalizing, and high externalizing/internalizing). Finally, analyses were conducted to determine if the relationship between externalizing problems and each type of risky behavior was moderated by symptoms of anxiety or depression. All relationships were explored for gender differences.

Behavioral Symptom Group Differences

Results of the current study revealed significant differences in levels of risky behavior among adolescents, depending on their behavioral symptomatology (i.e., high externalizing, high internalizing, and comorbid externalizing and internalizing). It was hypothesized that adolescents with comorbid externalizing and internalizing problems would report the highest levels of engagement in risky behavior due to their complex behavioral pathology. Consistent with that hypothesis, adolescents with comorbid behavioral symptoms reported the highest rates of tobacco use, marijuana use, sexual behavior, and depression/suicidal behavior, which differed

significantly from reports of students with internalizing problems, who reported the lowest rates of all behaviors except for depression/suicidal behavior.

A possible explanation for these findings may be that adolescents with comorbid behavioral symptoms demonstrate more severe behavioral problems overall, which lead to increased risk-taking. An examination of the means of all measures in the present study (Table 4) revealed that students in the comorbid symptom group exhibited greater symptom severity in externalizing problems, dysphoric mood, negative affect, negative self-evaluation, somatic complaints, and physical symptoms compared to their peers in the high externalizing and high internalizing groups. These findings are consistent with previous research suggesting that adolescents with comorbid externalizing and internalizing disorders demonstrate more serious and chronic disturbances, and worse developmental outcomes (Keiley, Lofthouse, Bates, Dodge, & Petit, 2003; Newman, Moffitt, Caspit, & Silva, 1998; Youngstrom, Findling, & Calabrese, 2003). Further, adolescents with more severe and complex psychopathology may be more vulnerable to increased risk of tobacco use, drug use, and sexual behavior (Chan, Dennis & Funk, 2008; Fanti & Henrich, 2010; Lawrence, Mitrou, Sawyer, & Zubrick, 2010; Upadhyaya, Deas, Brady, & Kruesi, 2002).

Results of this study did not indicate a significant difference in self-reported alcohol use among adolescents with externalizing, internalizing, and comorbid behavioral symptoms. Although the group differences were not statistically significant, the means demonstrated a pattern that is similar to the significant group differences for all other types of risky behavior explored in this study. Adolescents with comorbid symptoms reported the highest rates of alcohol use, followed by adolescents with externalizing problems, and then those with internalizing problems with the lowest group mean. Although these results should be interpreted

with caution, as they are not statistically significant, they suggest a need for further investigation of the difference in self-reported alcohol use among groups of students with externalizing, internalizing and comorbid behavioral profiles.

Gender Differences

Results of this study also indicated significant differences between adolescent males and females in smoking/tobacco use and depression/suicidal behavior. With regard to smoking and tobacco use, males reported significantly higher levels of smoking and tobacco use compared to their female peers. This finding is largely consistent with existing research. For example, the meta-analysis conducted by Byrnes et al. (1999) demonstrated that males reported higher engagement in smoking and tobacco use. In addition, recent data from the 2015 national YRBS demonstrated that male students reported significantly higher engagement in tobacco use (e.g., smoking a whole cigarette before age 13; current cigarette, cigar, smokeless tobacco, and electronic vapor product use) than their female peers. Although countless studies have examined gender differences in various types of risky behavior, the specific reasons for the gender differences have been largely unexplored. One possibility is that female students, who are more likely to experience internalizing symptoms (Avenevoli, Swendsen, He, Burstein, & Merikangas, 2015; Merikangas et al., 2010), are prevented from engaging in tobacco use due to symptoms of harm avoidance or anxiety related to the social acceptability of the behavior.

As hypothesized, females reported significantly higher rates of depression and suicidal behavior. This finding is consistent with results of the national YRBS survey (Kann et al., 2016), which demonstrated that female students reported a higher prevalence of all five suicide-related behaviors that were examined (i.e., feeling sad or hopeless, seriously considering

attempting suicide, having made a suicide plan, attempting suicide, and having made a suicide attempt resulting in an injury, poisoning, or overdose that had to be treated by a doctor or nurse).

It was hypothesized that male adolescents would report higher rates of alcohol use, marijuana use, and sexual behavior, in addition to tobacco use. In contrast to these hypotheses and previous research findings (Byrnes et al., 1999), the results of this study suggest no significant gender differences in alcohol use, marijuana use, or sexual behavior. This may be partially explained by the age of the adolescents. Approximately 63% of the participants in this sample were younger than 16. Significant gender differences in alcohol use, substance use, and delinquency may not emerge until young adulthood (ages 18 to 21), when many individuals transition from high school to college (Agrawal & Lynsky, 2007; Byrnes et al., 1999; Kandel & Chen, 2000; Perkonigg et al., 2008).

Interaction of Behavioral Symptom Group and Parent Monitoring

In accordance with previous research identifying academic achievement, school engagement, and positive parenting as protective factors (e.g., Chapman et al., 2013; Michael et al., 2015; Resnick et al., 1997), it was hypothesized that high levels of these factors would be associated with lower levels of risky behavior. However, the results of the current study indicated that only parent monitoring/supervision and school engagement were linearly related to risky behavior among adolescents in this sample.

Protective relationships were expected to be consistent across students with high levels of externalizing, high levels of internalizing, and high levels of comorbid internalizing and externalizing symptoms. In line with that hypothesis, high levels of student engagement were protective against risky behavior consistently across behavioral symptom groups. However, results of the MANCOVA analyses revealed that the relationship between behavioral symptoms

and depression/suicidal behavior was moderated by levels of parent monitoring. Among students with internalizing problems, those with poor parent monitoring reported significantly higher levels of depression/suicidal behavior than those with high levels of parent monitoring. Among students with externalizing and comorbid behavioral symptoms, reports of suicidal behavior were consistent among students with high and low levels of parent monitoring. This finding suggests that parent monitoring/supervision may be an important protective factor for suicidal behavior among adolescents with internalizing problems. Unfortunately, internalizing problems may not be easily recognized by parents and teachers and adolescents with internalizing symptoms may be less likely to receive the types of support and services that are necessary in developing appropriate skills to cope with feelings of emotional distress.

Predictors of Smoking and Tobacco Use

Regression results demonstrated that externalizing problems and all four anxiety scales were significantly related to smoking and tobacco use. However, physical symptoms of anxiety were positively related to smoking/tobacco use, whereas harm avoidance, social anxiety, and separation anxiety/panic were negatively related to smoking/tobacco use. In terms of depression symptoms, regression models revealed that anhedonia/negative affect and somatic complaints were positively related, whereas dysphoric mood was negatively related to smoking/tobacco use.

These results help to explain previous inconsistencies in the literature by demonstrating that particular dimensions of anxiety and depression are associated with tobacco use in different ways. For instance, the positive impact of physical symptoms of anxiety and anhedonia/negative affect on tobacco use is supported by studies hypothesizing that adolescents smoke as a means to self-medicate and alleviate their symptoms (Chaiton, Cohen, O'Laughlin, & Rehm, 2010; Boden, Fergusson, & Horwood, 2010). Alternatively, the negative relationship between

smoking/tobacco use and harm avoidance, social anxiety, and separation anxiety/panic is consistent with the theory that internalizing symptoms such as fearfulness and avoidance may prevent adolescent tobacco use due to social acceptability and health-risk concerns (Leventhal & Zvolensky, 2015).

Interaction between externalizing problems, somatic complaints and gender. Symptoms of somatic complaints moderated the relationship between externalizing problems and tobacco use among females. Among female adolescents with high levels of externalizing problems, tobacco use was highly dependent on symptoms of somatic complaints. Specifically, females with externalizing problems and high levels of somatic complaints reported higher rates of tobacco use compared to those with low levels of somatic complaints. In contrast, among females with low levels of externalizing symptoms, rates of tobacco use were similar for those with high and low levels of somatic complaints.

For male adolescents, the somatic complaint score was the strongest predictor of smoking and tobacco use, but those symptoms increased the risk of smoking consistently across males with low levels of externalizing and high levels of externalizing. For females in this sample, high levels of somatic complaints alone may not result in increased levels of smoking or tobacco use, but the co-occurrence of somatic complaints and externalizing symptoms may demonstrate the type of complex psychopathology that is related to more chronic disturbances and severe impairments (Fanti & Henrich, 2010).

These results suggest that female adolescents may be more likely to use tobacco products as a means to cope with or alleviate somatic symptoms only when they experience co-occurring externalizing problems, whereas males may self-medicate with tobacco products in order to alleviate somatic symptoms regardless of their level of externalizing problems. The results

highlight the need for a better understanding of the risks that may be unique to males and females with comorbid externalizing and internalizing behavioral symptoms compared to externalizing or internalizing problems only.

Predictors of Alcohol Use

Regression results revealed that all four anxiety scales were significantly related to alcohol use. Externalizing symptoms and gender were not found to be significant. In addition, the variable for symptoms of somatic complaints was positively related to alcohol use and was the only significant predictor in the regression model that included the measures of depression.

Of particular interest is that externalizing problems were not found to significantly predict alcohol use. This is a clear contrast from previous research findings. A significant amount of empirical research has explored the relationship between externalizing behavioral symptoms and alcohol use. For instance, alcohol use in adolescence has been associated with aggressive, antisocial, and disruptive behaviors (Burk et al., 2011; Farmer et al., 2016; Fergusson et al., 2005; Kuperman et al, 2001). However, much of the previous literature has failed to account for comorbid internalizing psychopathology. It is possible that a greater proportion of students in this sample demonstrated co-occurring symptoms of anxiety or depression, which were stronger predictors of alcohol use.

Compared to externalizing behavior problems, the role of internalizing problems in the development of alcohol use has received little research attention (Hussong, Jones, Stein, Baucom, & Boeding, 2011). Further, empirical research examining internalizing symptoms as a risk factor for alcohol use has been inconsistent, particularly during early adolescence (Colder, Chassin, Lee, & Villalta, 2010, Hussong et al., 2011). Two possible reasons for this are the co-occurrence of externalizing and internalizing problems and the heterogeneity of internalizing

problems (Colder et al., 2017). In this study, somatic complaints and physical symptoms of anxiety were positively related to alcohol use, whereas harm avoidance, social anxiety, and separation/panic were negatively related to alcohol use. These findings are similar to the results indicating predictors of smoking/tobacco use and clearly show the heterogeneous nature of internalizing problems. These results are also consistent with the work of Kaplow, Curran, Angold, and Costello (2001), who demonstrated that children with symptoms of generalized anxiety were at increased risk for initiation of alcohol use during adolescence, whereas children with symptoms of separation anxiety were at decreased risk.

No significant interactions were found between externalizing symptoms and any of the anxiety or depression domains. The lack of a significant moderation between externalizing and internalizing problems in this sample indicates that the impact of internalizing problems on alcohol use was consistent among adolescents with low and high levels of externalizing problems. This finding is contrary to two recent studies that demonstrated a significant interaction between externalizing and internalizing symptoms predicting alcohol use (Colder et al., 2017, Colder et al., 2018). However, those studies did not individually examine as many dimensions of anxiety and depression. For example, Colder et al. (2018) found that the highest probability of alcohol use was observed at high levels of externalizing symptoms and low levels of internalizing symptoms. Authors concluded that there was a negative protective effect of internalizing symptoms on alcohol use among early adolescents who had high levels of externalizing symptoms, but only one score was used to measure internalizing symptoms. As previously mentioned, it is extremely likely that the heterogeneity of internalizing problems is one of the main reasons for the continued lack of research consensus in this area. Thus, the

results of this study extend beyond previous research by examining the main and interaction effects of specific dimensions of anxiety and depression.

Predictors of Marijuana Use

In the regression model that included anxiety symptoms, externalizing symptoms did not predict marijuana use. Again, physical symptoms of anxiety were positively related to marijuana use and social anxiety was negatively related to marijuana use. These results suggest that physical symptoms and social anxiety are significantly related to marijuana use, beyond externalizing problems. In the regression model that included depression symptoms, externalizing problems and gender positively predicted marijuana use, with males reporting higher marijuana usage. The only depression subscale that was related to marijuana use was somatic complaints, which was positively associated.

The relationship between externalizing symptoms and marijuana use was not moderated by internalizing symptoms, similar to results found by Colder et al. (2017). Age of onset of marijuana use is typically later in adolescence (Colder et al., 2017). Although it was not specifically analyzed in the current study, it is possible that a more robust interaction may emerge among samples of older adolescents and young adults.

Predictors of Risky Sexual Behavior

Externalizing symptoms and physical symptoms of anxiety were positively related to risky sexual behavior among adolescents, whereas social anxiety was negatively related to risky sexual behavior. The only depression scale that was significantly related to sexual behavior among adolescents was somatic complaints, which was positively related. As previously discussed, existing research fails to analyze the specific dimensions of anxiety and depression that predict risky sexual behavior among adolescents. These results demonstrate how different

internalizing symptoms may differentially predict risky sexual behavior, which has been a source of great confusion and inconsistency in the literature.

No significant interactions were found between externalizing symptoms and any of the anxiety or depression domains. The lack of a significant moderation between externalizing and internalizing problems in this sample indicates that the impact of internalizing problems on sexual behavior was consistent among adolescents with low and high levels of externalizing problems. This finding is contrary to the work of Boislard et al. (2013), who found that boys with high levels of externalizing and low levels of internalizing problems were at increased risk of earlier sexual onset, whereas boys and girls with high levels of both internalizing and externalizing behaviors were not found to be at increased risk. Authors speculated that boys with externalizing problems and concomitant internalizing problems may refrain from early sexual activity because they are too anxious to initiate sexual contacts. They also hypothesized that aggression combined with anxiety may result in social impairment, whereas those who are aggressive, but also proactively engaged are often more accepted by their peers (Vitaro & Brendgen, 2011). Further research in this area is necessary in order to understand the relationship between externalizing problems, specific dimensions of anxiety and depression, and risky sexual behavior.

Predictors of Suicidal Behavior

As expected, externalizing symptoms did not significantly predict depression/suicidal behavior. However, physical symptoms and social anxiety were both positively related to depression/suicidal behavior. Further, gender was a significant predictor, with adolescent females more likely to report suicidal behavior. In addition, harm avoidance symptoms were negatively related to suicidal behavior, which is not surprising considering that individuals with

high levels of harm avoidance would also be likely to avoid self-harm and self-injurious behaviors.

Interaction between externalizing symptoms and separation anxiety/panic. A two-way interaction was found between externalizing symptoms and separation anxiety/panic, suggesting that separation anxiety moderates the relationship between externalizing symptoms and suicidal behavior. Adolescents with high levels of externalizing problems and high levels of separation anxiety/panic reported the highest rates of depression/suicidal behavior. Adolescents with high levels of externalizing problems and co-occurring separation anxiety/panic may be more vulnerable to depression and suicidal behavior than their peers with high levels of separation anxiety/panic alone. Similar to the results indicating a significant interaction between somatic complaints and externalizing symptoms predicting tobacco use, the co-occurrence of separation anxiety and externalizing symptoms may demonstrate a complex and more severe behavioral profile that is related to more chronic disturbances and overall impairment (Fanti & Henrich, 2010).

Interaction between externalizing symptoms and somatic complaints. The interaction between externalizing problems and somatic complaints was significant, suggesting that somatic complaints moderated the relationship between externalizing problems and suicidal behavior. Among adolescents with higher levels of externalizing problems, those with lower levels of somatic complaints reported higher rates of depression/suicidal behavior compared to those with high levels of somatic complaints. These results suggest that externalizing problems may serve as a protective factor for students with high levels of somatic complaints, reducing the chance of depression/suicidal behavior. Because adolescents with externalizing problems tend to be more heavily influenced by their peers (Monahan, Steinberg, & Cauffman, 2009; Prinstein,

Boergers, & Spirito, 2001), it is possible that adolescents with depression and comorbid externalizing problems may have access to wider social groups and more peer interaction than students with internalizing symptoms alone. Those social support networks may help to reduce isolation, thereby reducing the risk of suicidal behavior.

Implications for Practice

The results of this study have implications for school-based and clinical services for students with emotional and behavioral problems. Overall, the results of this study suggest that students with comorbid symptomatology engage in the highest rates of risky behavior. These findings support the hypothesis that youth with comorbid internalizing and conduct problems display increased levels of symptomatology, impairment, and adjustment problems, and are more likely to engage in increased risk-taking (Hoeve, McReynolds, & Wasserman, 2013, Fanti & Henrich, 2010). These data emphasize the need to identify and implement evidenced-based interventions to prevent or reduce both externalizing and internalizing behavior problems, which in turn may decrease maladaptive risky behavior during adolescence.

Because of the extremely high risk associated with comorbid behavioral symptoms and certain internalizing symptoms alone (e.g., physical symptoms, somatic complaints), it is important that schools implement universal screening procedures that aim to identify both externalizing and internalizing symptoms. Historically, internalizing problems have not been addressed in the school setting (Walker, Nishioka, Zeller, Severson, & Feil, 2000). Although some studies have shown that classroom teachers are able to identify students struggling with internalizing symptoms (e.g., Layne, Bernstein, & March, 2006), these students are less likely to be referred for support because their behaviors are less likely to cause an interruption and easily go unnoticed. Therefore, it is important that teachers and other school professionals receive

increased training and support to accurately identify students who exhibit internalizing symptoms. It is also important that initial screening and identification of internalizing problems leads to more comprehensive assessment of behavioral and mental health needs, which can lead to the provision of appropriate services to address specific symptoms of both externalizing and internalizing problems.

As longitudinal research suggests, demonstration of emotional and behavioral needs early in childhood predict a trajectory of poor outcomes and risky behaviors through adolescence and into adulthood. Therefore, preventative frameworks that address the externalizing and internalizing problems of children are likely to prevent risky behavior and poor health outcomes later in life. The results of this study strongly suggest the need for multi-tiered systems of support (MTSS) that emphasize prevention and responsiveness to intervention. For example, School-Wide Positive Behavioral Interventions and Supports (SWPBIS) is a comprehensive approach for the prevention and treatment of problem behavior (Sugai & Horner, 2009). It is a continuum of supports that emphasizes (a) prevention, (b) early intervention, (c) data-based decision making, and (d) capacity building within and across schools (Lewis, Jones, Horner, & Sugai, 2010). SWPBIS has demonstrated effectiveness at addressing externalizing problems and represents a promising framework for supporting students' internalizing and mental health needs (McIntosh, Ty, & Miller, 2014). The framework can be enhanced by adding evidence-based interventions for supporting internalizing needs within SWPBIS systems, providing professional development in identifying internalizing problems, and incorporating screening for internalizing problems into existing screening systems (McIntosh et al., 2014).

In addition to supporting students with internalizing problems within the school setting, interventions that engage parents and target parent monitoring and supervision skills could help

to reduce the rates of depression and suicidal behavior among adolescents with internalizing problems. Results of this study indicated that adolescents with internalizing problems and low levels of parent monitoring were at the highest risk for suicidal behavior. Suicide is one of the leading causes of death among adolescents in the United States (Kann et al., 2016) and adolescent reports of suicidal ideation and behaviors are associated with depression and anxiety. Unfortunately, these behaviors are often overlooked by parents, as well as teachers, and persist into adulthood (Joffe, Van Lieshout, Duncan, & Boyle, 2014). Thus, programs and interventions that result in increased parent monitoring could help to protect adolescents from suicidal behavior.

Finally, symptoms of harm avoidance emerged as a protective factor for risky behavior among adolescents in this sample. While emphasis should be placed on preventing or reducing behavior problems which may lead to risky behavior, it is also important that schools provide adolescents with instruction to make them aware of the serious risks associated with various types of risky behavior. A complete understanding of the short-and long-term risks associated with health-risk behaviors may dissuade teenagers from engaging in such activities.

Implications for Future Research

The results of the current study provide some important directions for future research. In particular, research on the association between internalizing symptoms and risky behavior should examine and compare the impact of different symptoms of anxiety and depression on adolescent risk-taking. Moving forward, it is important to fully understand whether internalizing symptoms are likely to serve as a protective or risk factor for maladaptive adolescent behavior.

In addition, continued examination of the interaction of externalizing and internalizing symptoms is necessary. Further, future research should also thoroughly examine how various

internalizing symptoms interact and impact different types of risky behavior. The current study analyzed broad categories of risky behavior, but future research should also investigate the relationships between various dimensions of externalizing and internalizing symptoms, and specific risk behaviors (e.g., age at first marijuana use, number of sexual partners, average number of alcoholic drinks per week).

Although parent monitoring has clearly been established as a protective factor for adolescent risky behavior, to date there has not been any research done examining the moderating effect of parent monitoring. This finding has major implications and extends beyond existing research by demonstrating that parent monitoring and supervision may be especially important for adolescents with internalizing problems. Further investigation into this relationship is necessary in order to determine if these results are replicable among other adolescents with emotional and behavioral needs.

There is a significant need for longitudinal research examining the predictors and outcomes of risky behavior throughout the life course. First, longitudinal data could help establish causal links between externalizing and internalizing behavioral profiles, risky behavior during adolescence, and adult outcomes. In addition, longitudinal research examining the outcomes of SWPBIS could help determine whether or not multi-tiered systems can effectively prevent and the negative developmental trajectories that lead to risky behavior and poor outcomes. Furthermore, it would allow us to examine the complex relationships between behavioral symptomatology and risky behavior at various points throughout adolescence and into adulthood.

Limitations

Several limitations to this study warrant discussion. First, because this was a referred sample and relatively small compared to national cohort studies, findings do not necessarily represent all secondary students with emotional and behavioral needs. In addition, because the sample consisted of younger adolescents, it may not generalize to older adolescents who may engage in a greater number of risk behaviors. Because there is no national demographic data of secondary students who are at-risk for an emotional or behavioral disorder, it is difficult to determine whether or not the participant characteristics of this sample are consistent with the general population of combined group of students at-risk and with disabilities. It is also possible that adolescents with internalizing problems are underrepresented in this sample given problems with identification and referral. These issues pose a potential threat to external validity, as results may not generalize to other populations of high school students.

There are several study limitations related to measurement. First, parent report of adolescent externalizing symptoms was used as a sole indicator of externalizing problems. It would have been optimal to analyze data from multiple informants (e.g., two parents when available, several content area teachers). With regard to the YRBS, which was used to measure adolescent risky behavior, low internal consistency on several of the subscales made it impossible to reliably analyze risky behavior related to unintentional injury, aggression, dating violence, driver safety, or exercise/recreation. Further, the adapted version of the YRBS did not have many items within each subscale. Finally, there is no normative sample data for the APQ or SEI. Therefore, it was not possible to draw comparisons to a national sample of adolescents. It is possible that the participants in this study sample, who were all referred due to serious emotional or behavioral impairment, reported lower levels of school engagement and parent monitoring than what would be reported by adolescents and parents in a broader sample.

Although these measures are widely used in research examining adolescent populations, the use of these measures without a normed-sample for comparison is a limitation of this study.

Conclusions

The results of this study provide an important contribution to the current literature base, as previous empirical research examining internalizing symptoms as a risk factor for various types of maladaptive risky behavior has been inconsistent. The lack of consensus regarding the impact of internalizing symptoms on risky behavior can likely be attributed to failure to take into consideration students' co-occurring externalizing needs and the heterogeneity of internalizing problems. This study addressed these issues by controlling for comorbid externalizing symptoms and by examining the impact that specific dimensions of anxiety and depression had on various type of risky behavior. Overall, results indicate that students with comorbid externalizing and internalizing symptoms have the most complex and severe behavioral problems. Additionally, the findings of this study help to explain the inconsistency in previous research findings by demonstrating that different dimensions of anxiety and depression impact adolescent risk-taking in different ways. Finally, more research is needed in order to understand the specific behavioral profiles that are predictive of maladaptive risky behavior during youth.

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Table 1

Demographic Characteristics of the Participants

	Total Sample		High Ext.		High Int.		High Ext./ High Int.	
	n	%	*n*	%	*n*	%	*n*	%
Total Sample	476	100	287	60.3	67	14.1	122	25.6
Gender								
Male	307	64.5	204	66.4	41	13.4	62	20.2
Female	169	35.5	83	49.1	26	15.4	60	35.5
Age								
13	5	1.1	2	40	1	20	2	40
14	113	23.7	74	65.5	18	15.9	21	18.6
15	175	36.8	103	58.9	18	10.3	54	30.9
16	131	27.5	85	64.9	19	14.5	27	20.6
17	46	9.7	22	47.8	10	21.7	14	30.4
18	6	1.3	1	16.7	1	16.7	4	66.7
Grade								
8	33	6.9	24	72.7	5	15.2	4	12.1
9	224	47.1	139	62.1	26	11.6	59	26.3
10	192	40.3	115	59.9	26	13.5	51	26.6
11	21	4.4	6	28.6	8	38.1	7	33.3
Not Reported	6	1.3	3	50	2	33.3	1	16.7
Ethnicity								
White/Caucasian	253	53.2	151	59.7	34	13.4	68	26.9
Black/African American	177	37.2	111	62.7	24	13.6	42	23.7
Hispanic/Latino	26	5.5	15	57.7	7	26.9	4	15.4
Other	20	4.2	10	50	2	10	8	40
Family Income								
$0 - $20,000	169	35.5	109	64.5	17	10.1	43	25.4
$20,001 - $40,000	151	31.7	84	55.6	26	17.2	41	27.2
$40,001 - $60,000	70	14.7	40	57.1	15	21.4	15	21.4
$60,001 - $80,000	42	8.8	25	59.5	4	9.5	13	30.1
$80,001 - $100,000	18	3.8	14	77.8	1	5.6	3	16.7
$100,001 - $120,000	10	2.1	5	50	0	0	5	50
$120,001 +	6	1.3	2	33.3	3	50	1	16.7
Not Reported	10	2.1	8	80	1	10	1	10

(continued)

Table 1 (continued)

	Total Sample		High Ext.		High Int.		High Ext./ High Int.	
	n	%	*n*	%	*n*	%	*n*	%
State								
Ohio	172	36.1	105	61	19	11	48	28
South Carolina	120	25.2	68	56.7	18	15	34	28.3
Pennsylvania	84	17.6	52	61.9	12	14.3	20	23.8
Missouri	49	10.3	32	65.3	8	16.3	9	18.4
Kansas	51	10.7	30	58.8	10	19.6	11	21.2
Special Education Classification								
No Label	245	51.5	142	58	37	15.1	66	26.9
SLD	101	21.2	59	58.4	19	18.8	23	22.8
ED	68	14.3	42	61.8	6	8.8	20	29.4
OHI	47	9.9	32	68.1	5	10.6	10	21.3
Other	9	1.9	8	88.9	0	0	1	11.1
Not Reported	6	1.3	4	66.7	0	0	2	33.3

Note. Ext. = externalizing; Int. = internalizing; SLD = Specific Learning Disability; ED = Emotional Disturbance; OHI = Other Health Impairment.

Table 2

Description of Measures in the Study

Measure	Description	Respondent	Scores used for analyses
Independent Measures			
BASC-2	Rating scale that measures a broad range of emotional and behavioral problems	Parent	Externalizing Problems Composite
RADS-2	Rating scale of depressive symptoms	Student	Dysphoric Mood, Anhedonia/Negative Affect, Negative Self-Evaluation, Somatic Complaints
MASC	Rating scale of anxiety related symptoms	Student	Social Anxiety, Separation Anxiety/Panic, Harm Avoidance, Physical Symptoms
WJ-III	Battery of tests to assess academic achievement	Student	Broad Reading Cluster, Broad Math Cluster
SEI	Survey of self-perceived engagement with school	Student	Total Score
APQ	Rating scale of parenting constructs related to conduct problems and delinquency	Parent	Parental Involvement, Positive Parenting, Poor Monitoring/Supervision
Dependent Measures			
YRBS	Adapted version of the national survey of adolescent health-risk behaviors	Student	Smoking/Tobacco Use, Alcohol Use, Marijuana Use, Sexual Behaviors, Depression/Suicidal Behavior

Note. BASC-2 = Behavior Assessment System for Children, 2nd Edition; RADS-2 = Reynolds Adolescent Depression Scale, 2nd Edition; MASC = Multidimensional Anxiety Scale for Children; WJ-III = Woodcock Johnson Tests of Achievement, 3rd Edition; SEI = Student Engagement Instrument; APQ = Alabama Parenting Questionnaire; YRBS = Youth Risk Behavior Survey

Table 3

Internal Consistency Reliability Statistics of the Youth Risk Behavior Survey Subscales

Subscale	Number of items	*n*	α	*r*
Marijuana Use	3	376	.83	.641
Sexual Behavior	4	379	.82	.747
Smoking/Tobacco Use	8	471	.82	.444
Depression/Suicidal Behavior	4	271	.77	.500
Alcohol Use	4	422	.75	.533
Truancy/Violence	5	428	.47	.152
Other Drug Use	7	376	.45	.173
Driving	5	427	.21	.138
Physical Violence and Relationships	2	461	.12	.073
Exercise/Recreation	4	476	.10	.004

Note. α = Cronbach's coefficient alpha; *r* = mean inter-item correlation

Table 4

Means and Standard Deviations of Measures by Symptom Group

Variable	High Ext. (n = 287) *M (SD)*	High Int. (n = 67) *M (SD)*	High Ext./ High Int. (n = 122) *M (SD)*
BASC-2 Externalizing	72.49 (10.04)	51.48 (5.17)	76.19 (12.73)
RADS-2			
Dysphoric Mood	44.20 (7.68)	56.06 (8.38)	59.34 (8.95)
Anhedonia/Negative Affect	50.79 (8.64)	55.82 (9.87)	59.46 (12.73)
Negative Self-Evaluation	48.83 (7.11)	57.10 (8.58)	63.58 (9.27)
Somatic Complaints	49.60 (9.17)	57.19 (7.82)	61.51 (6.81)
MASC			
Physical Symptoms	46.83 (8.38)	58.84 (9.52)	59.32 (9.52)
Harm Avoidance	44.59 (11.51)	51.87 (10.49)	47.80 (10.84)
Social Anxiety	46.54 (8.20)	64.13 (8.96)	60.21 (10.90)
Separation/Panic	48.60 (9.02)	61.10 (12.56)	58.68 (12.09)
WJ-III			
Broad Reading	89.67 (11.30)	93.00 (13.23)	90.07 (11.87)
Broad Math	80.68 (10.76)	78.72 (13.61)	79.35 (11.79)
SEI Total	115.41 (13.25)	114.30 (14.59)	107.68 (12.05)
APQ			
Parent Involvement	35.03 (5.84)	37.87 (6.86)	33.10 (5.76)
Positive Parenting	24.15 (3.76)	25.73 (3.04)	23.30 (4.24)
Poor Monitoring	20.83 (6.13)	17.32 (5.02)	21.60 (6.59)
YRBS			
Alcohol Use	3.28 (3.71)	2.57 (3.30)	4.02 (4.05)
Smoking/Tobacco Use	5.39 (6.59)	3.33 (5.66)	6.70 (6.88)
Marijuana Use	3.35 (4.32)	2.59 (4.08)	4.30 (4.96)
Sexual Behavior	5.88 (5.23)	2.86 (4.88)	6.05 (5.32)
Depression/Suicidal Behavior	0.21 (.59)	0.68 (.99)	1.12 (1.25)

Note. Ext. = externalizing; Int. = internalizing; BASC-2 = Behavior Assessment System for Children, 2nd Edition; RADS-2 = Reynolds Adolescent Depression Scale, 2nd Edition; MASC = Multidimensional Anxiety Scale for Children; WJ-III = Woodcock Johnson Tests of Achievement, 3rd Edition; SEI = Student Engagement Instrument; APQ = Alabama Parenting Questionnaire; YRBS = Youth Risk Behavior Survey.

Table 5

Means and Standard Deviations of Measures by Gender

Variable	Female (n = 169) *M (SD)*	Male (n = 307) *M (SD)*
BASC-2 Externalizing	72.47 (14.91)	69.39 (11.59)
RADS-2		
Dysphoric Mood	52.22 (10.51)	48.39 (10.51)
Anhedonia/Negative Affect	55.83 (11.85)	52.55 (9.80)
Negative Self-Evaluation	56.87 (10.03)	52.07 (9.87)
Somatic Complaints	55.60 (9.23)	52.68 (10.15)
MASC		
Physical Symptoms	53.11 (10.54)	50.96 (10.72)
Harm Avoidance	44. 15 (12.77)	47.69 (10.51)
Social Anxiety	54.54 (12.56)	51.40 (11.13)
Separation/Panic	56.33 (13.28)	51.08 (10.32)
WJ-III		
Broad Reading	91.91 (12.61)	89.36 (11.21)
Broad Math	78.50 (11.02)	80.85 (11.65)
SEI Total	113.26 (12.18)	113.21 (14.26)
APQ		
Parent Involvement	35.00 (6.27)	34.87 (6.05)
Positive Parenting	23.89 (4.17)	24.30 (3.68)
Poor Monitoring	19.74 (6.27)	20.96 (6.20)
YRBS		
Alcohol Use	3.67 (3.95)	3.23 (3.66)
Smoking/Tobacco Use	4.84 (5.72)	5.76 (7.04)
Marijuana Use	2.97 (3.96)	3.79 (4.73)
Sexual Behavior	5.12 (4.69)	5.75 (5.59)
Depression/Suicidal Behavior	0.99 (1.23)	0.25 (0.62)

Note. BASC-2 = Behavior Assessment System for Children, 2nd Edition; RADS-2 = Reynolds Adolescent Depression Scale, 2nd Edition; MASC = Multidimensional Anxiety Scale for Children; WJ-III = Woodcock Johnson Tests of Achievement, 3rd Edition; SEI = Student Engagement Instrument; APQ = Alabama Parenting Questionnaire; YRBS = Youth Risk Behavior Survey.

Table 6

Means and Standard Deviations of Measures by Symptom Group and Gender

	High Ext. *M (SD)*		High Int. *M (SD)*		High Ext./ High Int. *M (SD)*	
Variable	Female (n = 83)	Male (n = 204)	Female (n = 26)	Male (n = 41)	Female (n = 60)	Male (n = 62)
BASC-2 Externalizing	73.76 (10.82)	71.98 (9.68)	51.62 (5.66)	51.39 (4.90)	79.72 (14.47)	72.77 (9.74)
RADS-2						
Dysphoric Mood	45.40 (8.58)	43.72 (7.25)	55.54 (7.30)	56.39 (9.07)	60.23 (7.34)	58.48 (10.27)
Anhedonia/Negative Affect	51.71 (9.57)	50.41 (8.23)	56.35 (10.82)	55.49 (9.35)	61.32 (12.98)	57.66 (12.31)
Negative Self-Evaluation	51.17 (7.37)	47.88 (6.80)	57.54 (8.33)	56.83 (8.83)	64.47 (8.77)	62.73 (9.72)
Somatic Complaints	50.61 (8.35)	49.18 (9.47)	56.54 (7.50)	57.61 (8.08)	62.08 (6.61)	60.95 (7.01)
MASC						
Physical Symptoms	46.78 (8.23)	46.85 (8.46)	59.19 (8.33)	58.61 (10.30)	59.22 (9.10)	59.42 (9.98)
Harm Avoidance	41.07 (12.90)	46.02 (10.60)	52.38 (10.90)	51.54 (10.34)	44.83 (11.81)	50.66 (9.01)
Social Anxiety	46.96 (9.08)	46.36 (7.83)	64.92 (9.43)	63.63 (8.73)	60.53 (11.49)	59.90 (10.38)
Separation/Panic	50.25 (10.05)	47.93 (8.50)	66.15 (13.21)	57.90 (11.13)	60.48 (13.25)	56.94 (10.66)
WJ-III						
Broad Reading	91.93 (11.35)	88.90 (11.21)	93.90 (14.71)	92.37 (12.31)	91.08 (13.13)	89.02 (10.44)
Broad Math	79.81 (10.41)	80.99 (10.91)	75.30 (13.48)	80.97 (13.41)	78.33 (10.41)	80.29 (12.98)
SEI Total	115.57 (12.07)	115.34 (13.74)	115.38 (13.21)	113.64 (15.52)	109.31 (11.04)	106.03 (12.89)
APQ						
Parent Involvement	35.27 (4.98)	34.94 (6.14)	38.26 (8.28)	37.65 (6.00)	33.37 (6.48)	32.84 (5.00)
Positive Parenting	23.94 (3.78)	24.24 (3.76)	25.88 (3.81)	25.63 (2.50)	22.98 (4.57)	23.60 (3.90)
Poor Monitoring	19.20 (6.26)	21.46 (5.98)	17.76 (5.05)	17.05 (5.05)	21.28 (6.49)	21.92 (6.74)

(continued)

Table 6 (continued)

Variable	High Ext. *M (SD)* Female (n = 83)	High Ext. *M (SD)* Male (n = 204)	High Int. *M (SD)* Female (n = 26)	High Int. *M (SD)* Male (n = 41)	High Ext./ High Int. *M (SD)* Female (n = 60)	High Ext./ High Int. *M (SD)* Male (n = 62)
YRBS						
Alcohol Use	3.62 (3.67)	3.15 (3.72)	1.82 (2.81)	3.06 (3.54)	4.52 (4.48)	3.57 (3.59)
Smoking/Tobacco Use	4.63 (5.21)	5.70 (7.06)	1.88 (3.90)	4.22 (6.39)	6.41 (6.53)	6.98 (7.24)
Marijuana Use	2.69 (3.52)	3.58 (4.56)	1.25 (2.34)	3.52 (4.76)	3.98 (4.68)	4.61 (5.24)
Sexual Behavior	5.62 (4.58)	5.97 (5.45)	2.55 (4.31)	3.07 (5.30)	5.55 (4.72)	6.56 (5.87)
Depression/Suicidal Behavior	0.47 (0.88)	0.10 (0.38)	0.91 (1.07)	0.54 (0.92)	1.74 (1.33)	0.54 (0.83)

Note. Ext. = externalizing; Int. = internalizing; BASC-2 = Behavior Assessment System for Children, 2nd Edition; RADS-2 = Reynolds Adolescent Depression Scale, 2nd Edition; MASC = Multidimensional Anxiety Scale for Children; WJ-III = Woodcock Johnson Tests of Achievement, 3rd Edition; SEI = Student Engagement Instrument; APQ = Alabama Parenting Questionnaire; YRBS = Youth Risk Behavior Survey.

Table 7

Bivariate Correlations and Descriptive Statistics of Covariates and Dependent Variables in the MANCOVA

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Broad Reading	---										
2. Broad Math	.51**	---									
3. School Engagement	.01	-.06	---								
4. Parent Involvement	-.02	-.01	.23**	---							
5. Positive Parenting	-.04	-.05	.12*	.65**	---						
6. Poor Monitoring	-.14**	.03	-.07	-.34**	-.25**	---					
7. Alcohol Use	.13*	.20**	-.18**	-.14**	-.13**	.28**	---				
8. Smoking/Tobacco Use	.06	.16**	-.22**	-.18**	-.13**	.28**	.60**	---			
9. Marijuana Use	.12*	.18**	-.27**	-.17**	-.11*	.34**	.63**	.67**	---		
10. Sexual Behavior	-.06	-.01	-.09	-.16**	-.09	.32**	.37**	.40**	.50**	---	
11. Depression/Suicidal Behavior	.06	-.07	-.12*	-.06	-.03	.03	.16**	.11*	.06	.03	---
M	90.24	80.06	113.23	34.92	24.15	20.53	3.38	5.44	3.51	5.53	.51
SD	11.76	11.49	13.53	6.12	3.86	6.25	3.77	6.61	4.49	5.30	.95
Skewness	.15	.06	.13	-.11	-.52	.55	1.01	1.09	.98	.23	1.23
Kurtosis	.24	-.26	.19	.10	-.30	-.11	.50	.18	-.25	-1.41	.12

Note. $N = 476$

*$p < .05$

**$p < .01$

Table 8

Bivariate Correlations and Descriptive Statistics of Variables in the Regression Analyses

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Externalizing	---														
2. Gender	-.11*	---													
3. Physical Symptoms	-.13**	-.10*	---												
4. Harm Avoidance	-.18**	.15**	.18**	---											
5. Social Anxiety	-.17**	-.13**	.48**	.34**	---										
6. Separation/Panic	-.12*	-.22**	.41**	.33**	.51**	---									
7. Dysphoric Mood	-.06	-.17**	.57**	.16**	.56**	.41**	---								
8. Anhedonia	-.10*	-.15**	.24**	-.21**	.23**	.09	.30**	---							
9. Negative Self-Eval.	.09	-.23**	.49**	-.02	.45**	.27**	.71**	.46**	---						
10. Somatic Complaints	-.02	-.14**	.65**	.10*	.42**	.33**	.67**	.12**	.61**	---					
11. Alcohol Use	.07	-.06	.10*	-.21**	-.15**	-.14**	.15**	.10*	.12*	.18**	---				
12. Tobacco Use	.15**	.07	.10*	-.23**	-.15**	-.19**	.04	.14**	.09*	.18**	.60**	---			
13. Marijuana Use	.10	.09	.07	-.10*	-.17**	-.15**	.05	.09	.06	.14**	.63**	.67**	---		
14. Sexual Behavior	.13*	.06	.01	-.16**	-.18**	-.15**	.03	-.01	.03	.12*	.37**	.40**	.50**	---	
15. Suicidal Behavior	.07	-.37**	.30**	-.08	.22**	.18**	.48**	.34**	.48**	.35**	.16**	.11*	.06	.03	---
M	70.48	--	51.72	46.43	52.52	52.94	49.75	53.72	53.78	53.72	3.38	5.44	3.51	5.53	.51
SD	12.94	--	10.69	11.48	11.74	11.72	10.67	10.68	10.18	9.92	3.77	6.61	4.49	5.30	.95
Skewness	.47	--	.47	-.34	.36	.83	.21	1.05	.47	-.37	1.01	1.09	.98	.23	1.23
Kurtosis	.46	--	-.21	-.22	-.69	.30	-.65	1.48	-.44	-.31	.50	.18	-.25	-1.41	.12

Note. $N = 476$

*$p < .05$

**$p < .01$

Table 9

Multivariate Test Results of the Two-Way Factorial MANOVA

	Wilks' λ	*df*	Error *df*	*F*	*p*	Partial η^2
Symptom Group	.75	10	355	10.75	<.001	.13
Gender	.85	5	710	12.73	<.001	.15
Symptom Group × Gender	.95	10	710	1.78	.07	.02

Table 10

Univariate Test Results for the Symptom Group Main Effect of the Two-Way MANOVA

Variable	High Ext. *M (SD)*	High Int. *M (SD)*	High Ext./ High Int. *M (SD)*	*df*	*F*	*p*	Partial η^2
Alcohol Use	3.27 (3.59)	2.62 (3.37)	3.99 (4.06)	2	2.67	.07	.01
Smoking/Tobacco Use	5.61 (6.74)	3.40 (5.87)[c]	6.86 (6.92)[b]	2	5.00	.01	.03
Marijuana Use	3.33 (4.30)	2.36 (3.64)[c]	4.32 (4.98)[b]	2	4.13	.02	.02
Sexual Behavior	5.93 (5.20)[b]	2.64 (4.57)[a,c]	6.01 (5.53)[b]	2	7.59	.001	.04
Depression/Suicidal Behavior	0.17 (0.42)[b,c]	0.57 (0.66)[a,c]	0.82 (0.71)[a,b]	2	44.42	< .001	.20

Note. [a] Significantly different from High Ext.
[b] Significantly different from High Int.
[c] Significantly different from High Ext./High Int.

Table 11

Univariate Test Results for the Gender Main Effect of the Two-Way MANOVA

Variable	Female *M (SD)*	Male *M (SD)*	*df*	*F*	*p*	Partial η^2
Alcohol Use	3.48 (3.73)	3.32 (3.71)	1	0.10	.75	<.001
Smoking/Tobacco Use	4.84 (5.85)	6.09 (7.15)	1	4.01	.05	.01
Marijuana Use	3.02 (3.97)	3.71 (4.67)	1	3.33	.07	.01
Sexual Behavior	5.01 (4.61)	5.81 (5.76)	1	0.86	.36	.002
Depression/Suicidal Behavior	0.75 (0.70)	0.20 (0.46)	1	55.10	< .001	.13

Table 12

Significance of Regression Results of the Two-Way Factorial MANCOVA

	Wilks' λ	*df*	Error *df*	*F*	*p*	Partial η^2
Symptom Group	.80	10	516	6.17	< .001	.11
Gender	.89	5	258	6.70	< .001	.12
Symptom Group × Gender	.94	10	516	1.69	.08	.03
Broad Reading	.98	5	258	1.00	.42	.02
Broad Math	.98	5	258	1.25	.29	.02
Parent Involvement	.99	5	258	0.34	.89	.01
Positive Parenting	.98	5	258	1.12	.35	.02
Poor Monitoring/Supervision	.84	5	258	10.04	< .001	.16
School Engagement	.91	5	258	5.18	< .001	.09

Table 13

Multivariate Test Results of the Two-Way Factorial MANCOVA

	Wilks' λ	*df*	Error *df*	*F*	*p*	Partial η^2
Symptom Group	.96	10	650	1.36	.20	.02
Gender	.99	5	325	0.99	.43	.02
Symptom Group × Gender	.98	10	650	0.58	.83	.01
Poor Monitoring/Supervision	.92	5	325	5.77	< .001	.08
School Engagement	.94	5	325	4.24	.001	.06
Symptom Group × Poor Monitoring/Supervision	.94	10	650	2.18	.02	.03
Symptom Group × School Engagement	.97	10	650	1.18	.30	.02
Symptom Group × Poor Monitoring × Gender	.95	15	897	1.09	.36	.02
Symptom Group × School Engagement × Gender	.97	15	897	0.70	.79	.01

Table 14

Univariate Test Results of the Symptom Group and Parent Monitoring/Supervision Interaction Effect

	High Ext.		High Int.		High Ext./High Int.					
Variable	High PM *M (SD)*	Low PM *M (SD)*	High PM *M (SD)*	Low PM *M (SD)*	High PM *M (SD)*	Low PM *M (SD)*	*df*	*F*	*p*	Partial η^2
Alcohol Use	2.43 (3.20)	4.07 (3.79)	2.03 (2.90)	3.92 (4.23)	3.33 (3.65)	4.56 (4.33)	2	0.16	.85	.001
Tobacco Use	4.45 (6.06)	6.68 (7.18)	3.00 (5.61)	4.62 (6.78)	5.09 (6.57)	8.38 (6.91)	2	0.31	.74	.002
Marijuana Use	2.35 (3.85)	4.26 (4.51)	1.73 (3.04)	3.62 (4.65)	2.58 (4.08)	5.83 (5.24)	2	0.87	.42	.01
Sexual Behavior	4.55 (4.97)	7.31 (5.10)	2.03 (4.09)	4.38 (5.52)	3.62 (4.89)	8.08 (4.89)	2	1.14	.32	.01
Depression/ Suicidal Behavior	0.18 (0.45)	0.15 (0.37)	0.38 (0.57)	1.02 (0.68)	0.85 (0.72)	0.79 (0.71)	2	6.85	.001	.04

Note. PM = Parent Monitoring

Table 15

Moderated Regression Analysis of Externalizing Symptoms and Anxiety Predicting Smoking/Tobacco Use

	Model 1				Model 2				Model 3			
Predictor	*B*	*SE B*	*β*	*p*	*B*	*SE B*	*β*	*p*	*B*	*SE B*	*β*	*p*
BASC-2 Ext.	.07	.50	.13	**.003**	-.07	.08	-.14	.384	-.03	.09	-.05	.773
Gender	1.21	.02	.09	.056	1.3	.64	.09	**.050**	1.34	.65	.10	**.041**
MASC Physical Symptoms	.17	.63	.28	**< .001**	.18	.03	.29	**< .001**	.17	.03	.27	**< .001**
MASC Harm Avoidance	-.11	.03	-.18	**< .001**	-.11	.03	-.19	**< .001**	-.11	.03	-.20	**< .001**
MASC Social Anxiety	-.06	.03	-.11	**.049**	-.06	.03	-.10	.070	-.05	.03	-.08	.152
MASC Separation/Panic	-.09	.03	-.16	**.003**	-.09	.03	-.16	**.003**	-.09	.03	-.16	**.005**
Ext. × Gender					.09	.05	.29	.062	.07	.05	.22	.186
Ext. × Physical Symptoms					<.001	.002	.01	.907	.01	.01	.17	.338
Ext. × Harm Avoidance					-.001	.002	-.03	.566	.01	.01	.10	.515
Ext. × Social Anxiety					<.001	.002	-.01	.936	-.01	.01	-.26	.180
Ext. × Separation/Panic					<.001	.002	-.004	.943	-.004	.01	-.11	.587
Ext. × Physical Symptoms × Gender									-.01	.01	-.19	.287
Ext. × Harm Avoidance × Gender									-.004	.01	-.14	.363
Ext. × Social Anxiety × Gender									.01	.01	.27	.150
Ext. × Separation/Panic × Gender									.003	.01	.10	.562
R^2		.14				.15				.16		
F		12.94		**< .001**		7.46		**< .001**		5.70		**< .001**
Δ R^2						.01				.01		
Δ *F*						.90		.48		.89		.47

Table 16

Moderated Regression Analysis of Externalizing Symptoms and Anxiety Predicting Alcohol Use

	Model 1				Model 2				Model 3			
Predictor	*B*	*SE B*	*β*	*p*	*B*	*SE B*	*β*	*p*	*B*	*SE B*	*β*	*p*
BASC-2 Ext.	.01	.01	.03	.514	.03	.05	.12	.503	.06	.06	.19	.320
Gender	-.43	.39	-.05	.274	-.48	.40	-.06	.223	-.43	.41	-.05	.294
MASC Physical Symptoms	.09	.02	.25	**< .001**	.09	.02	.24	**< .001**	.08	.02	.23	**< .001**
MASC Harm Avoidance	-.05	.02	-.14	**.007**	-.05	.02	-.14	**.007**	-.05	.02	-.14	**.007**
MASC Social Anxiety	-.05	.02	-.16	**.007**	-.05	.02	-.16	**.008**	-.05	.02	-.14	**.023**
MASC Separation/Panic	-.04	.02	-.12	**.035**	-.04	.02	-.12	**.050**	-.04	.02	-.12	.053
Ext. × Gender					-.02	.03	-.08	.635	-.03	.03	-.14	.429
Ext. × Physical Symptoms					<.001	.001	-.01	.908	.001	.01	.04	.842
Ext. × Harm Avoidance					.001	.001	.05	.355	.003	.004	.13	.474
Ext. × Social Anxiety					-.001	.001	-.06	.332	-.01	.01	-.34	.108
Ext. × Separation/Panic					<.001	.001	.02	.732	.001	.01	.07	.761
Ext. × Physical Symptoms × Gender									-.001	.003	-.06	.736
Ext. × Harm Avoidance × Gender									-.001	.003	-.08	.642
Ext. × Social Anxiety × Gender									.004	.003	.28	.166
Ext. × Separation/Panic × Gender									<.001	.003	-.03	.879
R^2		.10				.10				.10		
F		7.64		**< .001**		4.28		**< .001**		3.26		**< .001**
Δ R^2						.003				.01		
Δ *F*						.32		.90		.52		.72

Table 17

Moderated Regression Analysis of Externalizing Symptoms and Anxiety Predicting Marijuana Use

	Model 1				Model 2				Model 3			
Predictor	*B*	*SE B*	*β*	*p*	*B*	*SE B*	*β*	*p*	*B*	*SE B*	*β*	*p*
BASC-2 Ext.	.03	.02	.08	.100	.04	.07	.10	.583	.05	.07	.14	.501
Gender	.72	.50	.08	.144	.64	.50	.07	.200	.76	.51	.08	.138
MASC Physical Symptoms	.11	.02	.26	**< .001**	.11	.03	.26	**< .001**	.11	.03	.25	**< .001**
MASC Harm Avoidance	-.02	.02	-.04	.456	-.02	.02	-.05	.384	-.02	.02	-.05	.376
MASC Social Anxiety	-.08	.02	-.20	**.002**	-.08	.02	-.20	**.002**	-.08	.03	-.20	**.002**
MASC Separation/Panic	-.05	.02	-.12	.059	-.04	.02	-.11	.093	-.03	.02	-.09	.162
Ext. × Gender					.002	.04	.01	.954	-.01	.04	-.03	.893
Ext. × Physical Symptoms					-.002	.002	-.06	.290	.003	.01	.10	.637
Ext. × Harm Avoidance					.001	.002	.04	.459	-.002	.01	-.07	.711
Ext. × Social Anxiety					-.002	.002	-.09	.190	<.001	.01	.01	.966
Ext. × Separation/Panic					.001	.002	.03	.628	-.01	.01	-.26	.260
Ext. × Physical Symptoms × Gender									-.003	.004	-.16	.443
Ext. × Harm Avoidance × Gender									.002	.004	.12	.527
Ext. × Social Anxiety × Gender									-.002	.004	-.09	.669
Ext. × Separation/Panic × Gender									.01	.004	.28	.175
R^2		.10				.11				.11		
F		6.43		**< .001**		3.90		**< .001**		3.05		**< .001**
Δ R^2						.01				.01		
Δ *F*						.88		.50		.72		.58

Table 18

Moderated Regression Analysis of Externalizing Symptoms and Anxiety Predicting Sexual Behavior

	Model 1				Model 2				Model 3			
Predictor	*B*	*SE B*	*β*	*p*	*B*	*SE B*	*β*	*p*	*B*	*SE B*	*β*	*p*
BASC-2 Ext.	.04	.02	.11	**.040**	-.05	.08	-.11	.552	-.03	.09	-.08	.702
Gender	.66	.59	.06	.260	.63	.59	.06	.285	.72	.61	.07	.237
MASC Physical Symptoms	.08	.03	.15	**.008**	.08	.03	.16	**.009**	.08	.03	.17	**.006**
MASC Harm Avoidance	-.04	.03	-.09	.098	-.05	.03	-.10	.073	-.05	.03	-.10	.079
MASC Social Anxiety	-.07	.03	-.16	**.013**	-.07	.03	-.16	**.013**	-.08	.03	-.18	**.008**
MASC Separation/Panic	-.04	.03	-.08	.203	-.03	.03	-.07	.273	-.03	.03	-.06	.372
Ext. × Gender					.06	.05	.23	.200	.05	.05	.21	.291
Ext. × Physical Symptoms					-.004	.002	-.11	.057	-.01	.01	-.27	.200
Ext. × Harm Avoidance					-.002	.002	-.04	.448	-.004	.01	-.11	.547
Ext. × Social Anxiety					<.001	.002	.01	.909	.01	.01	.19	.408
Ext. × Separation/Panic					.002	.002	.07	.338	-.002	.01	-.08	.740
Ext. × Physical Symptoms × Gender									.004	.01	.17	.413
Ext. × Harm Avoidance × Gender									.002	.004	.08	.661
Ext. × Social Anxiety × Gender									-.004	.01	-.19	.381
Ext. × Separation/Panic × Gender									.003	.004	.15	.475
R^2		.07				.09				.09		
F		4.96		**< .001**		3.27		**< .001**		2.52		**< .001**
Δ R^2						.02				.01		
Δ *F*						1.22		.30		.52		.72

Table 19

Moderated Regression Analysis of Externalizing Symptoms and Anxiety Predicting Depression/Suicidal Behavior

	Model 1				Model 2				Model 3			
Predictor	*B*	*SE B*	*β*	*p*	*B*	*SE B*	*β*	*p*	*B*	*SE B*	*β*	*p*
BASC-2 Ext.	.003	.002	.06	.151	.01	.01	.14	.372	.004	.01	.09	.610
Gender	-.41	.06	-.33	**< .001**	-.42	.06	-.33	**< .001**	-.42	.06	-.33	**< .001**
MASC Physical Symptoms	.01	.003	.25	**< .001**	.01	.003	.24	**< .001**	.01	.003	.23	**< .001**
MASC Harm Avoidance	-.01	.002	-.11	**.026**	-.01	.002	-.10	**.037**	-.01	.003	-.10	**.037**
MASC Social Anxiety	.01	.003	.16	**.004**	.01	.003	.15	**.006**	.01	.003	.15	**.006**
MASC Separation/Panic	-.001	.003	-.01	.845	<.001	.003	<.001	.942	<.001	.003	-.01	.931
Ext. × Gender					-.003	.004	-.11	.464	-.002	.01	-.08	.623
Ext. × Physical Symptoms					<.001	<.001	.01	.807	.001	.001	.16	.350
Ext. × Harm Avoidance					<.001	<.001	.00	.862	-.001	.001	-.13	.397
Ext. × Social Anxiety					<.001	<.001	-.06	.308	<.001	.001	-.12	.526
Ext. × Separation/Panic					<.001	<.001	.13	**.026**	.001	.001	.22	.248
Ext. × Physical Symptoms × Gender									<.001	<.001	-.15	.371
Ext. × Harm Avoidance × Gender									<.001	<.001	.14	.367
Ext. × Social Anxiety × Gender									<.001	<.001	.07	.714
Ext. × Separation/Panic × Gender									<.001	<.001	-.09	.599
R^2		.26				.28				.28		
F		24.51		**< .001**		14.28		**< .001**		10.56		**< .001**
Δ R^2						.02				.01		
Δ *F*						1.74		.13		.51		.73

Table 20

Moderated Regression Analysis of Externalizing Symptoms and Depression Predicting Smoking/Tobacco Use

	Model 1				Model 2				Model 3			
Predictor	*B*	*SE B*	*β*	*p*	*B*	*SE B*	*β*	*p*	*B*	*SE B*	*β*	*p*
BASC-2 Ext.	.08	.02	.15	**.001**	.01	.08	.02	.883	.05	.09	.09	.607
Gender	1.56	.63	.11	**.014**	1.5	.64	.11	**.019**	1.28	.65	.09	**.047**
RADS-2 Dysphoric Mood	-.09	.04	-.14	**.044**	-.08	.04	-.13	.068	-.08	.04	-.12	.087
RADS-2 Anhedonia/Negative Affect	.09	.03	.15	**.003**	.10	.03	.17	**.001**	.10	.03	.17	**.001**
RADS-2 Negative Self-Evaluation	-.02	.05	-.04	.623	-.03	.05	-.04	.584	-.02	.05	-.04	.622
RADS-2 Somatic Complaints	.19	.04	.28	**< .001**	.19	.04	.28	**< .001**	.18	.04	.27	**< .001**
Ext. × Gender					.05	.05	.15	.345	.04	.05	.11	.511
Ext. × Dysphoric Mood					.001	.004	.02	.850	.001	.01	.03	.901
Ext. × Anhedonia					-.004	.002	-.09	.097	-.01	.01	-.13	.441
Ext. × Negative Self-Eval.					.001	.004	.01	.884	-.02	.01	-.47	.085
Ext. × Somatic Complaints					<.001	.003	-.01	.913	.03	.01	.49	**.017**
Ext. × Dysphoric Mood × Gender									<.001	.01	-.003	.991
Ext. × Anhedonia × Gender									.001	.01	.04	.829
Ext. × Negative Self-Eval. × Gender									.01	.01	.47	.061
Ext. × Somatic Complaints × Gender									-.02	.01	-.52	**.012**
R^2		.09				.10				.12		
F		7.95		**< .001**		4.80		**< .001**		4.17		**< .001**
Δ R^2						.01				.02		
Δ *F*						1.01		.41		2.31		.06

Table 21

Moderated Regression Analysis of Externalizing Symptoms and Depression Predicting Smoking/Tobacco Use Among Females

	Model 1				Model 2			
Predictor	*B*	*SE B*	*β*	*p*	*B*	*SE B*	*β*	*p*
BASC-2 Ext.	.05	.03	.12	.133	.08	.46	.21	**.039**
RADS-2 Dysphoric Mood	-.06	.07	-.11	.398	-.04	.04	-.06	.607
RADS-2 Anhedonia/Negative Affect	.07	.04	.14	.125	.09	.07	.18	.058
RADS-2 Negative Self-Evaluation	-.01	.07	-.01	.921	-.03	.05	-.05	.680
RADS-2 Somatic Complaints	.12	.07	.19	.078	.11	.07	.17	.115
Ext. × Dysphoric Mood					.001	.004	.04	.757
Ext. × Anhedonia					-.004	.003	-.16	.143
Ext. × Negative Self-Evaluation					-.01	.01	-.24	.147
Ext. × Somatic Complaints					.01	.004	.24	**.025**
R^2		.06				.12		
F		2.08		**.07**		2.43		**.013**
ΔR^2						.06		
ΔF						2.74		**.031**

Table 22

Moderated Regression Analysis of Externalizing Symptoms and Depression Predicting Smoking/Tobacco Use Among Males

	Model 1				Model 2			
Predictor	*B*	*SE B*	*β*	*p*	*B*	*SE B*	*β*	*p*
BASC-2 Ext.	.11	.03	.18	**.002**	.12	.03	.19	**.001**
RADS-2 Dysphoric Mood	-.09	.06	-.13	**.**130	-.09	.06	-.14	.121
RADS-2 Anhedonia/Negative Affect	.12	.04	.17	**.007**	.12	.04	.16	**.008**
RADS-2 Negative Self-Evaluation	-.04	.06	-.05	.577	-.03	.06	-.04	.668
RADS-2 Somatic Complaints	.22	.05	.31	**< .001**	.21	.05	.31	**<.001**
Ext. × Dysphoric Mood					.002	.01	.03	.768
Ext. × Anhedonia					-.003	.004	-.05	.412
Ext. × Negative Self-Evaluation					.01	.01	.11	.211
Ext. × Somatic Complaints					-.01	.01	-.13	.108
R^2		.11				.12		
F		7.37		**< .001**		4.45		**< .001**
ΔR^2						.01		
ΔF						.83		.51

Table 23

Moderated Regression Analysis of Externalizing Symptoms and Depression Predicting Alcohol Use

	Model 1				Model 2				Model 3			
Predictor	*B*	*SE B*	*β*	*p*	*B*	*SE B*	*β*	*p*	*B*	*SE B*	*β*	*p*
BASC-2 Ext.	.02	.01	.08	.125	.06	.05	.20	.274	.09	.06	.30	.122
Gender	-.15	.39	-.02	.701	-.21	.39	-.03	.601	-.17	.40	-.02	.672
RADS-2 Dysphoric Mood	.03	.03	.07	.352	.03	.03	.08	.326	.03	.03	.09	.264
RADS-2 Anhedonia/Negative Affect	.02	.02	.07	.217	.02	.02	.07	.216	.02	.02	.07	.243
RADS-2 Negative Self-Evaluation	-.03	.03	-.07	.356	-.03	.03	-.08	.317	-.03	.03	-.07	.367
RADS-2 Somatic Complaints	.06	.03	.16	**.020**	.06	.03	.17	**.014**	.06	.03	.16	**.018**
Ext. × Gender					-.02	.03	-.11	.520	-.03	.03	-.18	.311
Ext. × Dysphoric Mood					.003	.002	.11	.207	-.01	.01	-.25	.356
Ext. × Anhedonia					<.001	.001	-.02	.732	.001	.004	.04	.816
Ext. × Negative Self-Eval.					-.004	.002	-.15	.089	-.01	.01	-.31	.300
Ext. × Somatic Complaints					.001	.002	.02	.790	.01	.01	.32	.151
Ext. × Dysphoric Mood × Gender									.01	.004	.37	.153
Ext. × Anhedonia × Gender									-.001	.003	-.07	.709
Ext. × Negative Self-Eval. × Gender									.003	.01	.15	.574
Ext. × Somatic Complaints × Gender									-.01	.004	-.33	.138
R^2		.04				.05				.06		
F		3.08		**.006**		2.09		**.02**		1.82		**.03**
ΔR^2						.01				.01		
ΔF						.89		.49		1.09		.36

Table 24

Moderated Regression Analysis of Externalizing Symptoms and Depression Predicting Marijuana Use

	Model 1				Model 2				Model 3			
Predictor	*B*	*SE B*	*β*	*p*	*B*	*SE B*	*β*	*p*	*B*	*SE B*	*β*	*p*
BASC-2 Ext.	.04	.02	.11	**.045**	.07	.07	.21	.269	.07	.07	.20	.318
Gender	1.13	.49	.12	**.022**	.99	.50	.11	**.046**	1.06	.51	.11	**.037**
RADS-2 Dysphoric Mood	-.02	.03	-.05	.517	-.02	.03	-.04	.608	-.02	.04	-.04	.615
RADS-2 Anhedonia/Negative Affect	.04	.02	.10	.072	.05	.03	.12	**.039**	.05	.03	.11	.075
RADS-2 Negative Self-Evaluation	-.03	.04	-.06	.451	-.03	.04	-.07	.394	-.03	.04	-.06	.454
RADS-2 Somatic Complaints	.10	.03	.21	**.004**	.10	.03	.21	**.003**	.10	.03	.21	**.004**
Ext. × Gender					-.02	.04	-.07	.708	-.01	.04	-.06	.749
Ext. × Dysphoric Mood					-.002	.003	-.05	.566	-.01	.01	-.23	.419
Ext. × Anhedonia					-.003	.002	-.12	.063	.004	.01	.13	.501
Ext. × Negative Self-Eval.					<.001	.003	-.01	.928	-.002	.01	-.05	.872
Ext. × Somatic Complaints					.001	.003	.02	.734	.01	.01	.13	.588
Ext. × Dysphoric Mood × Gender									.004	.01	.19	.490
Ext. × Anhedonia × Gender									-.01	.004	-.26	.169
Ext. × Negative Self-Eval. × Gender									.001	.01	.05	.864
Ext. × Somatic Complaints × Gender									-.003	.01	-.13	.587
R^2		.05				.07				.08		
F		3.40		**.003**		2.45		**.006**		1.96		**.017**
Δ R^2						.02				.01		
Δ *F*						1.23		.270		.63		.639

Table 25

Moderated Regression Analysis of Externalizing Symptoms and Depression Predicting Sexual Behavior

	Model 1				Model 2				Model 3			
Predictor	*B*	*SE B*	*β*	*p*	*B*	*SE B*	*β*	*p*	*B*	*SE B*	*β*	*p*
BASC-2 Ext.	.06	.02	.15	**.005**	.04	.08	.09	.628	.04	.08	.09	.673
Gender	.89	.58	.08	.125	.84	.58	.08	.152	.91	.60	.08	.127
RADS-2 Dysphoric Mood	-.02	.04	-.05	.572	-.02	.04	-.04	.636	-.02	.04	-.04	.644
RADS-2 Anhedonia/Negative Affect	-.01	.03	-.01	.816	-.001	.03	-.001	.981	-.01	.03	-.02	.795
RADS-2 Negative Self-Evaluation	-.02	.04	-.04	.598	-.02	.04	-.04	.652	-.02	.04	-.03	.712
RADS-2 Somatic Complaints	.10	.04	.19	**.007**	.11	.04	.20	**.006**	.11	.04	.20	**.006**
Ext. × Gender					.02	.05	.09	.639	.02	.05	.09	.639
Ext. × Dysphoric Mood					.003	.003	.07	.413	.001	.01	.02	.940
Ext. × Anhedonia					-.002	.002	-.07	.278	.01	.01	.19	.345
Ext. × Negative Self-Eval.					-.002	.003	-.05	.623	-.003	.01	-.08	.804
Ext. × Somatic Complaints					-.004	.003	-.09	.191	-.01	.01	-.20	.392
Ext. × Dysphoric Mood × Gender									.001	.01	.06	.836
Ext. × Anhedonia × Gender									-.01	.004	-.25	.177
Ext. × Negative Self-Eval. × Gender									.001	.01	.03	.906
Ext. × Somatic Complaints × Gender									.002	.01	.09	.691
R^2		.04				.03				.07		
F		2.87		**.010**		2.14		**.017**		1.72		**.045**
ΔR^2						.02				.01		
ΔF						1.26		.284		.60		.663

Table 26

Moderated Regression Analysis of Externalizing Symptoms and Depression Predicting Suicidal Behavior

	Model 1				Model 2				Model 3			
Predictor	*B*	*SE B*	*β*	*p*	*B*	*SE B*	*β*	*p*	*B*	*SE B*	*β*	*p*
BASC-2 Ext.	.001	.002	.02	.679	.001	.01	.02	.908	-.003	.01	-.05	.727
Gender	-.35	.05	-.28	**< .001**	-.34	.05	-.27	**< .001**	-.34	.05	-.27	**< .001**
RADS-2 Dysphoric Mood	.02	.003	.30	**< .001**	.02	.003	.29	**< .001**	.02	.004	.28	**< .001**
RADS-2 Anhedonia/Negative Affect	.01	.002	.15	**.001**	.01	.002	.16	**< .001**	.01	.003	.16	**< .001**
RADS-2 Negative Self-Evaluation	.01	.004	.16	**.013**	.01	.004	.15	**.014**	.01	.004	.15	**.019**
RADS-2 Somatic Complaints	<.001	.003	.01	.894	.001	.003	.01	.809	.001	.003	.02	.784
Ext. × Gender					<.001	.004	-.01	.943	.001	.004	.04	.781
Ext. × Dysphoric Mood					<.001	<.001	.05	.453	.001	.001	.16	.444
Ext. × Anhedonia					<.001	<.001	-.06	.237	-.001	.001	-.14	.353
Ext. × Negative Self-Eval.					<.001	<.001	.11	.125	.001	.001	.28	.240
Ext. × Somatic Complaints					-.001	<.001	-.12	**.026**	-.001	.001	-.20	.269
Ext. × Dysphoric Mood × Gender									<.001	.001	-.12	.552
Ext. × Anhedonia × Gender									<.001	<.001	.08	.587
Ext. × Negative Self-Eval. × Gender									<.001	.001	-.16	.455
Ext. × Somatic Complaints × Gender									<.001	.001	.09	.611
R^2		.39				.40				.41		
F		44.85		**<.001**		25.24		**< .001**		18.56		**< .001**
Δ R^2						.01				.003		
Δ *F*						1.43		.213		.51		.730

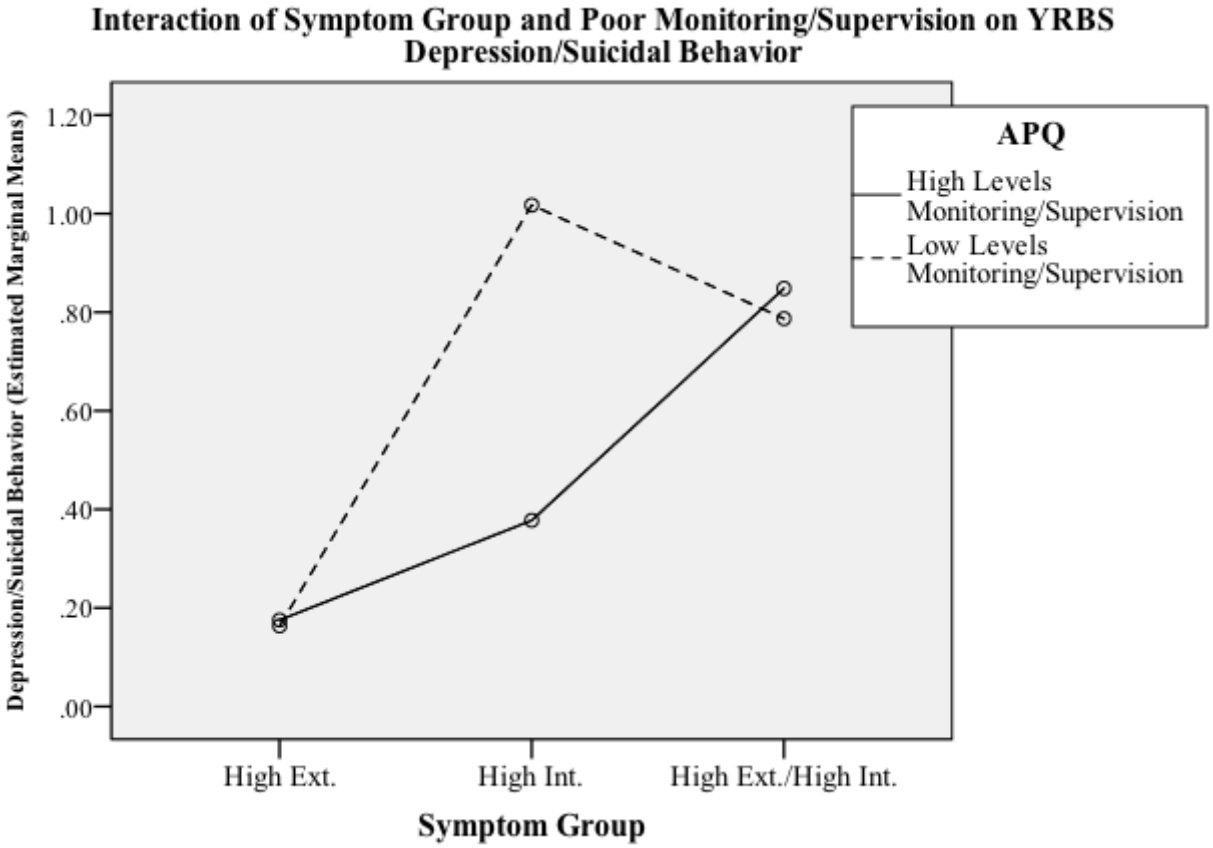

Figure 1. Plot of estimated marginal means of the Youth Risk Behavior Survey – Adapted, Depression/Suicidal Behavior subscale displaying the significant interaction between Symptom Groups (High Externalizing, High Internalizing, High Externalizing and Internalizing) and Levels of Parent Monitoring/Supervision as determined by scores on the Alabama Parenting Questionnaire (High Levels of Parent Monitoring/Supervision, Low Levels of Parent Monitoring/Supervision).

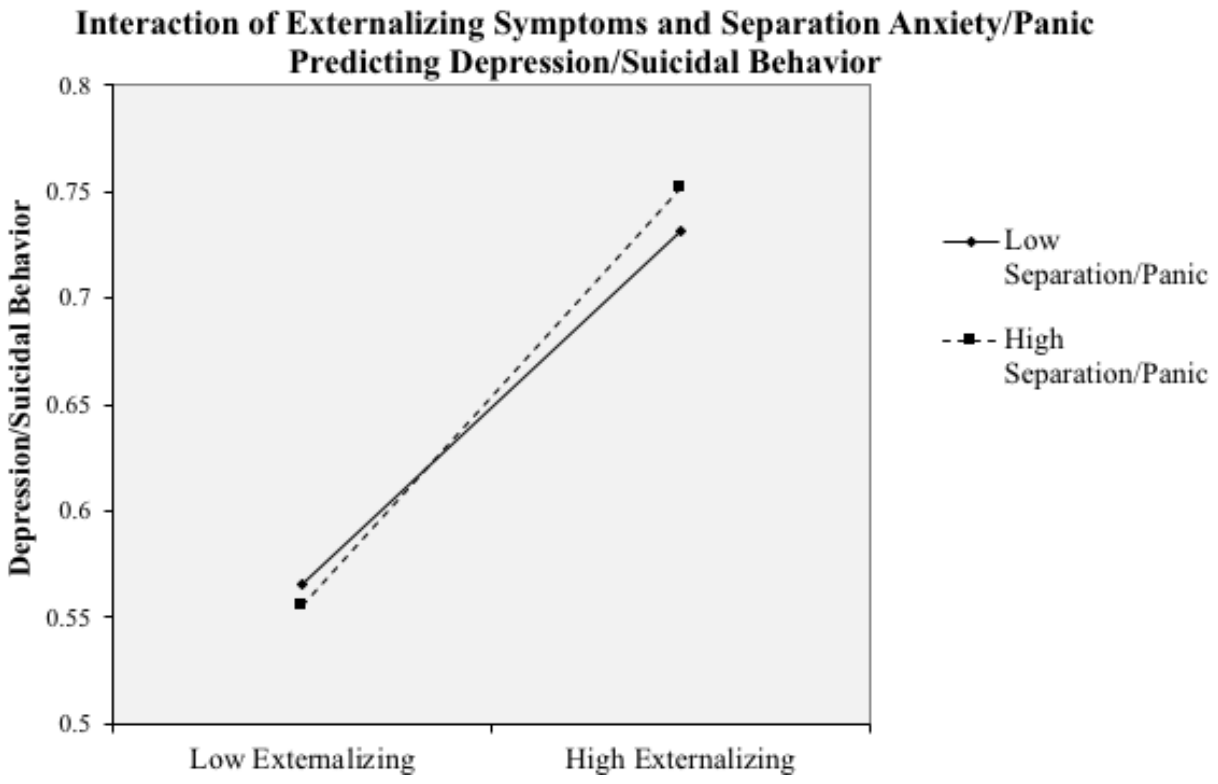

Figure 2. Plot of simple slopes displaying the significant interaction between Multidimensional Anxiety Scale for Children – Separation Anxiety/Panic subscale scores and Behavior Assessment System for Children, 2nd Edition, Parent Rating Scale – Externalizing Composite scores predicting Depression/Suicidal Behavior as measured by the Youth Risk Behavior Survey – Adapted.

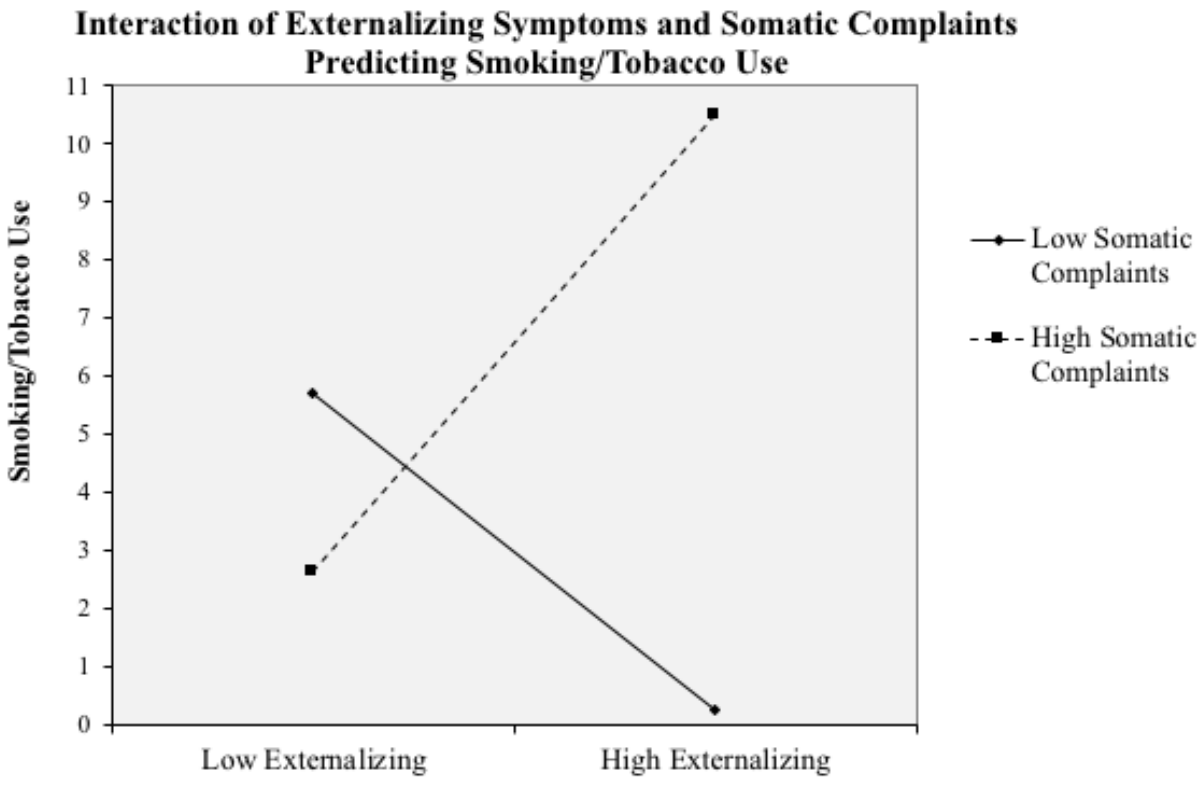

Figure 3. Plot of simple slopes displaying the significant interaction between Reynolds Adolescent Depression Scale, 2nd Edition – Somatic Complaints subscale scores and Behavior Assessment System for Children, 2nd Edition, Parent Rating Scale – Externalizing Composite scores predicting Smoking/Tobacco Use as measured by the Youth Risk Behavior Survey – Adapted.

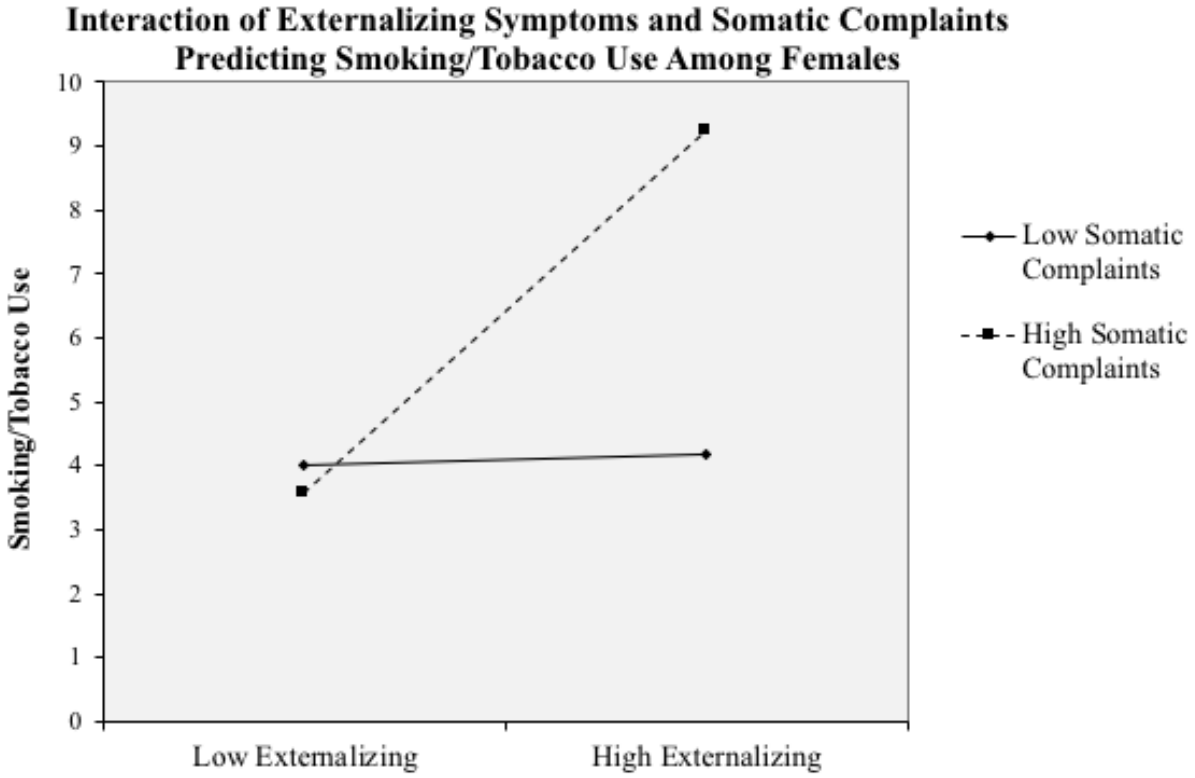

Figure 4. Plot of simple slopes displaying the significant interaction between Reynolds Adolescent Depression Scale, 2nd Edition – Somatic Complaints subscale scores and Behavior Assessment System for Children, 2nd Edition, Parent Rating Scale – Externalizing Composite scores predicting Smoking/Tobacco Use as measured by the Youth Risk Behavior Survey – Adapted among females.

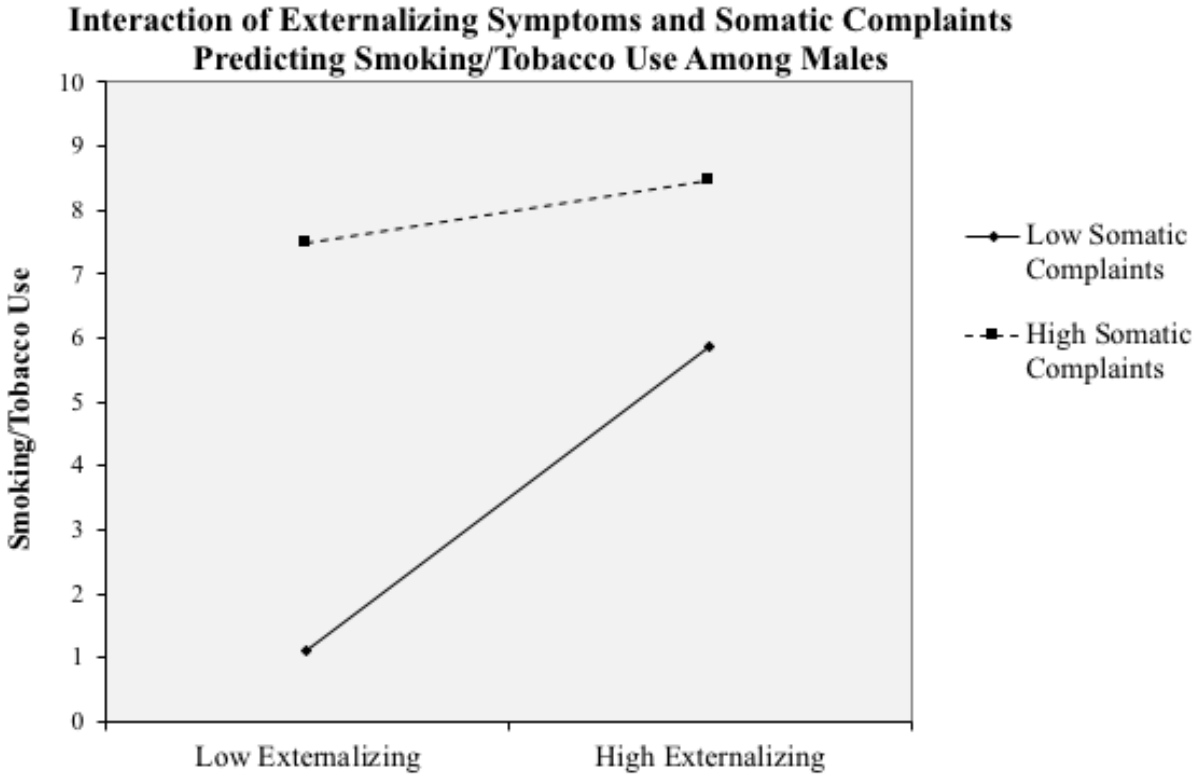

Figure 5. Plot of simple slopes displaying no interaction between Reynolds Adolescent Depression Scale, 2nd Edition – Somatic Complaints subscale scores and Behavior Assessment System for Children, 2nd Edition, Parent Rating Scale – Externalizing Composite scores predicting Smoking/Tobacco Use as measured by the Youth Risk Behavior Survey – Adapted among males.

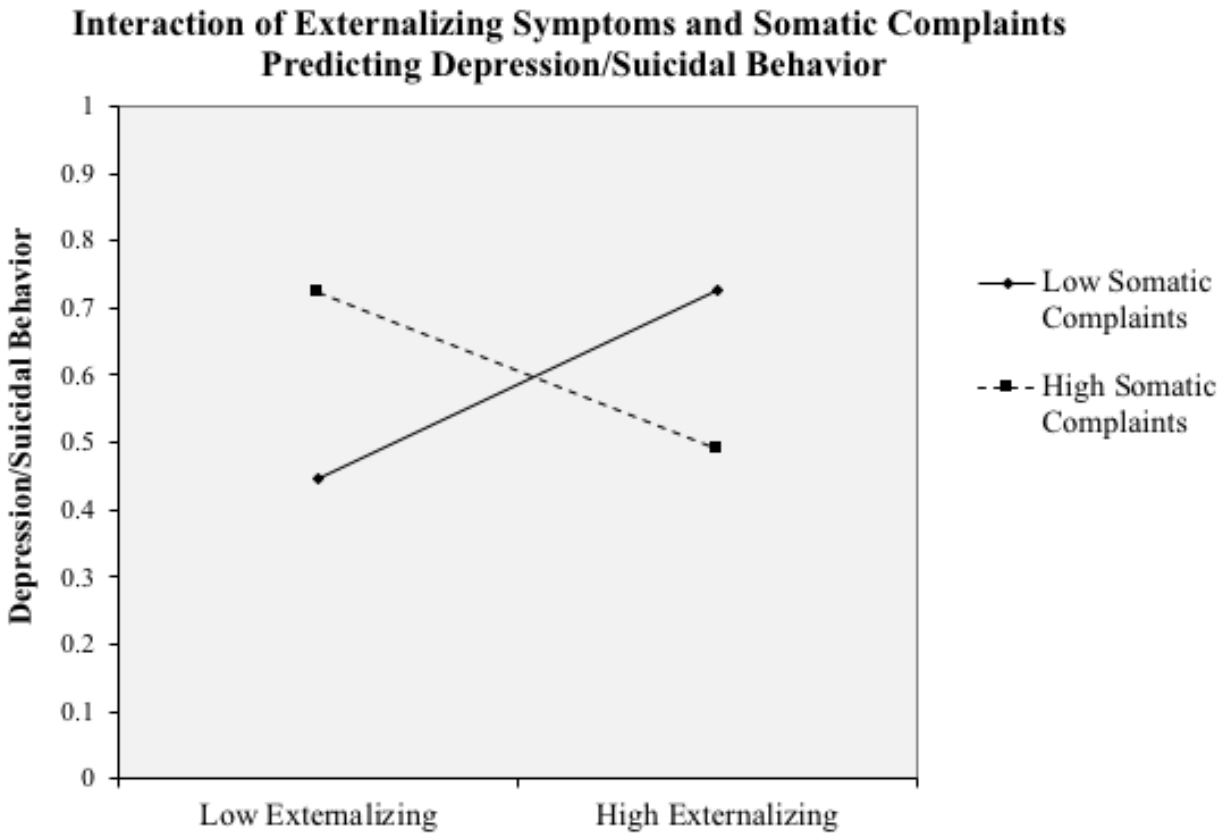

Figure 6. Plot of simple slopes displaying the significant interaction between Reynolds Adolescent Depression Scale, 2nd Edition – Somatic Complaints subscale scores and Behavior Assessment System for Children, 2nd Edition, Parent Rating Scale – Externalizing Composite scores predicting Depression/Suicidal Behavior as measured by the Youth Risk Behavior Survey – Adapted.

Allyse A. Hetrick

54 W. Saucon St. ◈ Hellertown, PA 18055
(610) 216-4435 ◈ aahetrick@gmail.com

EDUCATION

2012 – 2018 **Ph.D. Special Education**
Lehigh University, Bethlehem, PA
Advisor: Lee Kern, Ph.D.
Dissertation: *An Investigation of Internalizing, Externalizing, and Comorbid Behavioral Symptomatology as Predictors of Maladaptive Risky Behavior During Adolescence*
Dissertation Committee: Lee Kern, Ph.D. (Chair); George J. DuPaul, Ph.D.; Brenna K. Wood, Ph.D.; Bridget V. Dever, Ph.D.

2010 **M.Ed. Special Education**
Lehigh University, Bethlehem, PA

2007 **B.S.Ed. Elementary Education & Special Education**
West Chester University, West Chester, PA
Graduated Summa Cum Laude

CERTIFICATIONS

2007 – Present PA Instructional II Special Education PK-12
PA Instructional II Elementary Education K-6
PA Instructional II Mid-Level Mathematics 6-9
PA Instructional II Mid-Level English 6-9
PA Instructional II Mid-Level Science 6-9
PA Instructional II Mid-Level Citizenship Education 6-9

RESEARCH EXPERIENCE

8/2017 – 5/2018 **Research Assistant, *Pathway 360˚ Career Exploration Program***
Center for Promoting Research to Practice, Lehigh University
Supervisor: Lee Kern, Ph.D.
Assisted with a U.S. Department of Agriculture funded study to expand a comprehensive career readiness program for high school students; Coordinated with school professionals to track project goals

8/2014 – 8/2017 **Research Assistant, *Bridges to Educational Success for Teens (BEST)***
Center for Promoting Research to Practice, Lehigh University
Supervisor: George J. DuPaul, Ph.D.
Contributed to an IES funded study evaluating the effectiveness of a school-based treatment program for high school students with ADHD; Implemented a multi-component intervention for teenagers and parents;

Collaborated with team members at Ohio University; Assisted with recruitment, screening, and ongoing evaluation of students across multiple school districts; Organized and conducted cognitive, academic, and behavioral evaluations

Summer 2016 **Doctoral Exchange Student, *University of Oldenburg***
Department of Special Needs Education and Emotional and Behavioral Disturbances, Oldenburg, Germany
Participated in an exchange with a doctoral student; Compared special education systems in each country and collaborated on research in the area of students with emotional and behavioral needs; Delivered guest lectures to university students, professors, and guests

9/2013 – 5/2014 **Research Assistant, *Center for Adolescent Research in Schools (CARS)***
Center for Promoting Research to Practice, Lehigh University
Supervisor: Lee Kern, Ph.D.
Assisted with intervention follow-up and data analysis for a large-scale IES funded efficacy trial evaluating school-based treatments for adolescents with severe emotional and behavioral challenges

PROFESSIONAL EXPERIENCE

Summer 2018 **Adjunct Professor, *Department of Education and Human Services***
Lehigh University, Bethlehem, PA
Graduate Course: *SpEd 432 Positive Behavior Support*

8/2017 – 5/2018 **Graduate Assistant, *Center for Promoting Research to Practice***
Lehigh University, Bethlehem, PA
Director: Lee Kern, Ph.D.
Assisted with the start-up of Lehigh University Autism Services; Worked with University officials to establish insurance contracts; Coordinated Center events and activities; Managed the webpage and ongoing operations

Spring 2015 **Co-Instructor, *Department of Education and Human Services***
Lehigh University, Bethlehem, PA
Instructor: Brenna K. Wood, Ph.D.
Graduate Course: *SpEd 409 K-12 Classroom Environment and Management*

Spring 2015 **Co-Instructor, *Department of Education and Human Services***
Lehigh University, Bethlehem, PA
Instructor: Amanda Helman, Ph.D.
Graduate Course: *SpEd 419 Academic Interventions: PreK-8*

Fall 2014 **Co-Instructor, *Department of Education and Human Services***
Lehigh University, Bethlehem, PA
Instructor: Perry A. Zirkel, Ph.D.
Graduate Course: *EdL 432 Doctoral Seminar in Special Education Law*

Fall 2014 **Co-Supervisor, *Elementary and Special Education Student Teaching***
Lehigh University, Bethlehem, PA
Supervisor: Brenna K. Wood, Ph.D.
Assisted with classroom observations of student teachers in regular and special education settings; Provided written and verbal feedback on lesson plans, instructional strategies and behavior management techniques; Assisted in the preparation of documents for PA state teaching certification

Spring 2013 **Co-Instructor, *Department of Education and Human Services***
Lehigh University, Bethlehem, PA
Instructor: Brenna K. Wood, Ph.D.
Graduate Course: *SpEd 409 K-12 Classroom Environment and Management*

8/2007 – 8/2013 **Emotional Support Teacher**, ***Wind Gap Middle School***
Pen Argyl Area School District, Pen Argyl, PA
Provided academic, behavioral, and social skills instruction for 4^{th}-8^{th} grade students with serious emotional and behavioral needs; Developed and implemented function-based behavior intervention plans; Designed behavioral interventions for special education and regular education settings; Collaborated with administration, faculty, staff, and families to provide positive behavior support across school and home environments

1/2007 – 5/2007 **Student Teacher, *Highland Park Elementary School***
Upper Darby School District, Upper Darby, PA
Delivered evidence-based direct instruction in reading and math to 2^{nd}-5^{th} grade students; Provided instruction and assessment within a RTI framework

Summer 2004 – 2006 **Recreation Aide, *Summer Therapeutic Activities Program***
Kidspeace, Bethlehem, PA
Planned and implemented summer programming that targeted social and communication skills within an interactive, small-group setting for 4-16 year olds with Autism Spectrum Disorders

PUBLICATIONS

Kern, L., Hetrick, A. A., Commisso, C. E., Chen, R., Carter, D. (2018) Predictors of parent stress among secondary students with emotional and behavioral problems. Manuscript in preparation.

Evans, S., DuPaul, G. J., Hustus, C., & Hetrick, A. A. (2018). Evaluation of individualized education programs of adolescents with Attention Deficit/Hyperactivity Disorder. Manuscript in preparation.

Hetrick, A. A., Kern, L., & Dever, B. (2018). Comparison of educationally labeled and nonlabeled adolescents with emotional and behavioral needs. Manuscript submitted for publication.

Kern, L., Hetrick, A. A., Custer, B. A., & Commisso, C. (in press). An evaluation of IEP accommodations for secondary students with emotional and behavioral problems. *Journal of Emotional and Behavioral Disorders.*

Zirkel, P. A. & Hetrick, A. (2017). Which procedural parts of the IEP process are most judicially vulnerable? *Exceptional Children, 83*(2), 219-235. doi: 10.1177/0014402916651849

PRESENTATIONS

University Guest Lectures

Spring 2018 *Classroom management and positive behavior support for student teachers.* Presented in SpEd/TLT 442 General Education and Special Education Student Teaching Seminar, Lehigh University, Bethlehem, PA.
Course Instructor: L. Brook Sawyer, Ph.D.

Fall 2017 *Preventative classroom management for student teachers.* Presented in SpEd/TLT 442 General Education and Special Education Student Teaching Seminar, Lehigh University, Bethlehem, PA.
Course Instructor: Lee Kern, Ph.D.

Spring 2017 *Preventative classroom management.* Presented in SpEd/TLT 442 General Education and Special Education Student Teaching Seminar, Lehigh University, Bethlehem, PA.
Course Instructor: L. Brook Sawyer, Ph.D.

Fall 2016 *Preventative classroom management.* Presented in SpEd/TLT 442 General Education and Special Education Student Teaching Seminar, Lehigh University, Bethlehem, PA.
Course Instructor: Brenna K. Wood, Ph.D.

Summer 2016 *Effective classroom management strategies for the prevention of problem behavior*. Presented in Teaching Methods for Students with Emotional and Behavioral Disorders, University of Oldenburg, Germany.
Course Instructor: Viviane Albers, M.Ed.

Spring 2016 *Classroom management strategies for student teachers.* Presented in SpEd/TLT 442 General Education and Special Education Student Teaching Seminar, Lehigh University, Bethlehem, PA.
Course Instructor: L. Brook Sawyer, Ph.D.

Fall 2015 *Classroom management strategies for student teachers.* Presented in SpEd/TLT 442 General Education and Special Education Student Teaching Seminar, Lehigh University, Bethlehem, PA.
Course Instructor: Brenna K. Wood, Ph.D.

Spring 2015 *Classroom management strategies for student teachers.* Presented in SpEd/TLT 442 General Education and Special Education Student Teaching Seminar, Lehigh University, Bethlehem, PA.
Course Instructor: L. Brook Sawyer, Ph.D.

Fall 2014 *Providing support through social skills instruction and peer support strategies.* Presented in SpEd/TLT 409 K-12 Classroom Environment and Management, Lehigh University, Bethlehem, PA.
Course Instructor: Brenna K. Wood, Ph.D.

Fall 2014 *Classroom management strategies for student teachers.* Presented in SpEd/TLT 442 General Education and Special Education Student Teaching Seminar, Lehigh University, Bethlehem, PA.
Course Instructor: Brenna K. Wood, Ph.D.

Summer 2014 *Myths and common fears associated with IEP team member collaboration.* Presented in SpEd 332 Education and Inclusion of Individuals with Special Needs in K-12, Lehigh University, Bethlehem, PA.
Course Instructor: Amanda Helman, Ph.D.

Invited Presentations and Workshops

Bolz, T. & Hetrick, A. A. (2016, July). *Assessment and identification of children with emotional and behavioral disorders*. Invited workshop presentation, Implementation of Inclusion in the Educational System of Iraq: Selected Topics of Theory and Practice of Special Needs Education in Germany, University of Oldenburg, Oldenburg, Germany.

Hetrick, A. A. (2016, June). *Identification of students with emotional and behavioral challenges in the United States.* Invited presentation to the Department of Special Needs Education and Emotional and Behavioral Disturbances, University of Oldenburg, Oldenburg, Germany.

Refereed Presentations

Commisso, C. E., Custer, B. A., Kern, L., & Hetrick, A. A. (2018, March). *IEP accommodations for students with emotional and behavioral needs.* Paper presented at the 15th International Conference for Positive Behavior Support, San Diego, CA.

Commisso, C. E., Hetrick, A. A., Kern, L., & Custer, B. A. (2018, February). *Analysis of classroom and state testing accommodations for students with behavioral needs.* Paper presented at the Annual Council for Exceptional Children Convention, Tampa, FL.

Hetrick, A. A., Commisso, C. E., Evans, S., Owens, J. S., Kern, L., & Wehby, J. H. (2017, October). *A multi-state examination of accommodations for students with emotional and behavioral needs.* Symposium presented at the 22nd Annual Conference on Advancing School Mental Health, Washington, D.C.

Hetrick, A. A. & Kern, L. (2017, April). *A comparison of adolescents with emotional and behavioral needs across label categories.* Paper presented at the Annual Council for Exceptional Children Convention, Boston, MA.

Hetrick, A. A. & Kern, L. (2017, March). *Comparison of educationally labeled and non-labeled adolescents with emotional and behavioral needs*. Paper presented at the 14th International Conference for Positive Behavior Support, Denver, CO.

Hetrick, A. A. & Kern, L. (2017, February). *Discrepancies in identification among adolescents with emotional and behavioral needs.* Paper presented at the annual conference of the National Association of School Psychologists, San Antonio, TX.

Puzino, K. M., DuPaul, G. J., Golden, M. E., Kipperman, K. L., Hetrick, A. A., Evans, S. W., & Owens, J. S. (2017, February). *Predictors of school functioning among adolescents with ADHD.* Paper presented at the annual conference of the National Association of School Psychologists, San Antonio, TX.

Golden, M. E., DuPaul, G. J., & Hetrick, A. A. (2017, February). *Academic functioning in secondary students with ADHD and internalizing problems.* Poster presented at the annual conference of the National Association of School Psychologists, San Antonio, TX.

Kern, L. & Hetrick, A. A. (2016, June). *Issues related to a special education label in the US.* Paper presented at International Academic Conference on Social Sciences and Management, Bali, Indonesia.

Hetrick, A. A. & Zirkel, P. A. (2015, November). *Which procedural parts of the IEP process are most legally vulnerable?* Featured paper presentation at the annual conference of the Teacher Education Division of the Council for Exceptional Children, Tempe, AZ.

Kern, L. & Hetrick, A. A. (2015, October). *What does an EBD label tell us?* Paper presented at the Council for Children with Behavioral Disorders Conference, Atlanta, GA.

Custer, B., Hetrick, A. A., & Kern, L. (2015, April). *Accommodations for special education students with behavioral needs across five states.* Poster presented at the Annual Council for Exceptional Children Convention, San Diego, CA.

Hetrick, A. A. & Kern, L. (2015, March). *Does a special education label differentiate high school students with behavior problems?* Paper presented at the 12th International Conference for Positive Behavior Support, Boston, MA.

HONORS AND AWARDS

Spring 2017	Lehigh University College of Education Dean's Endowed Student Travel Scholarship
Fall 2016	Lehigh University College of Education Featured Student Testimonial
Fall 2015	Lehigh University College of Education Dean's Endowed Student Travel Scholarship
Fall 2015	Lehigh University Sesquicentennial Academic Showcase Nominated Exhibitor
May 2015	Leiser Scholar, Lehigh University's 43rd Annual Special Education Law Conference
Spring 2004	Phi Sigma Pi National Honor Fraternity Inductee, West Chester University Alpha Epsilon Chapter

PROFESSIONAL AFFILIATIONS

Council for Exceptional Children (CEC)
- -Council for Children with Behavioral Disorders (CCBD)
- -Teacher Education Division (TED)
- -Division for Research

Association for Positive Behavior Support (APBS)

National Association of School Psychologists (NASP)
- -Student Associate Member