School Connectedness & Attachment: Predicted and Moderated Relationships with Substance Use, Depression, and Suicidality among Teens At-Risk

by

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Declaration of Committee

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Ethics Statement

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or

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Abstract

Research has demonstrated that parent-adolescent attachment security and school connectedness are protective factors that buffer teens from risk for substance use, depression, and suicidality. However, past research has examined these factors independently, and little is known about how secure attachment and school connectedness work in conjunction to reduce adolescent risk. The present study examined the moderating role of school connectedness on the relationship between parent-adolescent attachment security and substance use, depression, and suicidality among at-risk adolescents drawn from a clinical sample (N = 480; 60.5% female; M_{age} = 14.86). Findings indicated that for both females and males with a secure attachment, school connectedness made a positive impact to reduce symptoms of depression and suicidality, respectively. Similarly, for males with attachment avoidance, school connectedness weakened the impact of attachment avoidance on suicidality. However, for females with attachment anxiety, school connectedness was unable to reduce symptoms of depression.

Keywords: Adolescent; attachment; school connectedness; substance use; depression; suicidality

This work is dedicated to my mom, dad, and brother

To my parents…

ਮਾਂ ਬਾਪ ਦੀ ਕਰੋ ਕਦਰ

ਇਹਨਾਂ ਬਿਨਾਂ ਕਿਸੇ ਨੇ ਪੁੱਛਣਾ ਨੀ,

ਜੇ ਇਹਨਾਂ ਦੀ ਨਜ਼ਰ ਚ ਡਿੱਗ ਗਏ,

ਤਾਂ

ਤੈਨੂੰ ਡਿੱਗੇ ਨੂੰ ਕਿਸੇ ਨੇ ਚੁਕਣਾ ਨੀ

To my brother…

“Those who can make you believe absurdities can make you commit atrocities.”
Voltaire

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Chapter 1.

Introduction

Adolescence is a developmental period marked by profound biological and social change. During this time, adolescents spend increasingly more time at school, among peers, and less time at home with their parents or caregivers. Beyond the academic aspect, school provides teenagers with an opportunity to meet new people, make new friends, create bonds with their teachers and peers, and begin the process of developing an identity. School connectedness is an adolescent's belief that teachers and peers care about them as individuals, their development, and their education (García-Moya et al., 2019). Whereas school climate is sometimes used to describe qualities inherent in the school context, school connectedness is sometimes used to describe a child's experience of connection to their school. It is possible, for example, that a school could take steps to create a positive school climate, but each child will experience this differently. Unfortunately, the terms have been used interchangeably, and the measures sometimes confound this distinction. School Connectedness for adolescents has significant implications for their adjustment, inside and outside the classroom (Loukas et al., 2016; Niehaus et al., 2012). Students who report having a strong connectedness to school tend to achieve higher grades and stronger relationships with their teachers (Biag, 2016; Monahan et al., 2010; Niehaus et al., 2012). Further, they tend to have stronger motivation to do well in school and higher self-efficacy, both academically and in life (Biag, 2016; Monahan et al., 2010; Niehaus et al., 2012). In contrast, those who report they have a weak connectedness to school tend to struggle in school, have poor/deviant relationships, and endure mental health issues (Dallal, 2020; Bao et al., 2018; Tian et al., 2019; Zhu, 2018).

Adolescents that are still developing, particularly emotionally, may experiment with substance use, risk-taking behaviours, and experience conflict with parents, and school stress (Branje, 2018; Hayre et al., 2019; Sánchez-Queija et al., 2016; Seo & Kim, 2017). As youth transition through high school, they experience rapid physical development and profound emotional changes. This creates positive experiences, such as new relationships and autonomous decision-making, and negative experiences such

as conflict with parents and school stress. Some adolescents may experiment with substance use, risk-taking behaviours, and some adolescents may spiral into depression and experience suicidal ideation, sometimes leading to suicidal attempts (Auerbach et al., 2015; Branje, 2018; Hayre et al., 2019; Ordaz et al., 2018; Pekrun, 2017; Sánchez-Queija et al., 2016; Seo & Kim, 2017; Shain, 2016; Vanhalst et al., 2015). Adolescents are still developing and may lack emotional awareness/understanding to combat the challenges of being a teenager.

The development of emotional understanding and regulation is shaped within parent-child relationships. A secure attachment leads to adaptive emotion regulation strategies, whereas an insecure attachment leads to maladaptive emotion regulation strategies (Brenning & Braet, 2013; Brumariu, 2015; Chen et al., 2019). Parents provide sensitive and responsive care, the building blocks of attachment security. They promote children's understanding of emotion, their identification and acceptance of their feelings, and their ability to regulate distress (Moretti et al., 2018). Sensitive and responsive care in the parent-teen relationship promotes attachment security and the development of emotion regulation competence (Kobak & Kerig, 2015; Moretti et al., 2018). In this way, adolescents who enjoy attachment security with their parent are better equipped to cope with school stressors, better positioned to derive benefits from school connectedness, may be less likely to use substances as a means of coping with adolescent distress, and are less vulnerable to feelings of hopelessness, depression, and suicidality.

In contrast, adolescents who endure attachment insecurity with their parents are less likely to cope with school stressors, may be more likely to use substances as a means of coping, and are more vulnerable to feelings of depression, and suicidality. Similarly, high school connectedness is a promising protective factor that decreases the risk for numerous adverse outcomes in adolescence (Bond et al., 2007; Furlong et al., 2011; Oldfield et al., 2018), whereas low school connectedness is a risk factor for maladaptive development (Monahan et al., 2010). However, there is a lack of research examining the moderating role of school connectedness on these outcomes in the presence of attachment security and insecurity. The present study examines the relationships between secure and insecure adolescent attachment and substance use, depression, and suicidality. In addition, this study investigates the moderating role of school connectedness on these relationships. Below, I review current research on the

association between attachment and substance use, depression, and suicidality and associations between school connectedness and these outcomes.

1.1. Empirical Findings

1.1.1. Attachment

Attachment is the biologically based bond between a caregiver and child, designed to promote survival (Ainsworth, 1973; Bowlby, 1982/1969). In the presence of this bond, the caregiver provides a secure base for the child, allowing them to take risks, develop, and explore the world around them. A secure attachment provides a sense of safety (safe haven) that buffers children and adolescents against overwhelming distress and provides them with a secure base from which to explore. The attachment patterns formed in early childhood may persist across the lifespan but may also change depending on experiences in caregiving relationships. Adolescent attachment differs from child attachment because adolescents spend more time away from their parents during this time. Despite this, parents play a significant role in their adolescent's social, cognitive, and emotional development (Sierra Hernandez & Moretti, 2019). Further, parental presence, support, understanding, and sensitivity play significant roles for children as they endure the changes and experiences of adolescence (Sierra Hernandez & Moretti, 2019).

According to Bowlby (1982/1969), internal working models of attachment representations emerge over time from the pattern of parent-child interactions and determine how children access and make use of others when they are distressed. Parental expressions of care, understanding, and reassurance all help to revise internal working models of the adolescent's self to interpret social experiences and help guide affect regulation throughout development (Duchesne & Ratelle, 2014; Keresteš et al., 2019; Mónaco et al., 2019). For adolescents, the importance lies in the attachment figure's ability to be available and responsive in times of stress and when they can communicate their feelings in a safe, secure environment without the need to defend themselves or hide what they are experiencing for fear of repercussions (Ainsworth et al., 1978; Bowlby, 1973; Chen, 2017: Mónaco et al., 2019; Moreira et al., 2018). Therefore, if a parent is unavailable, insensitive, and/or inconsistent in their support and care, this creates an insecure parent-adolescent attachment relationship (Sierra

Hernandez & Moretti, 2019). For this study, two types of attachment insecurity will be discussed, attachment avoidance and attachment anxiety. An adolescent high in attachment avoidance may deny attachment needs, avoid intimacy, present discomfort surrounding closeness, and excessive self-reliance. In contrast, an adolescent with an anxious attachment worries that others will not be available in times of need. Their anxiety may involve a preoccupation with social support, fear, and vigilance concerning abandonment and rejection (Brennan et al., 1998). Without attachment security, adolescents are susceptible to risk factors and may exhibit maladaptive internalizing (depression and suicidality) and/or externalizing (substance use) behaviours.

1.1.2. Substance Use

Substance use increases during adolescence (Hayre et al., 2019; Van Ryzin et al., 2012). The Centre for Addiction and Mental Health conducted a population survey in Ontario, Canada, which surveyed thousands of students from over 150 elementary and secondary schools (Ontario Student Drug Use and Mental Health Survey [OSDUHS], 2020). They found that approximately 42% of students in grades 7-12 drink alcohol, with this value increasing to 66% among 12th graders (OSDUHS, 2020); 20% of students in grades 9-12 abuse alcohol, and 19% report not remembering what happened when drinking (OSDUHS, 2016). Further, approximately 22% of students in grades 7-12 use marijuana, with the prevalence being 40% in grade 12 (OSDUHS, 2020) and 2% of which report symptoms of marijuana dependence (OSDUHS, 2016). Regarding tobacco use, 5% of students in grades 7-12 reported use, which doubles to 10% among 12th graders. Regarding street drug use among students in grades 9-12, the prevalence of magic mushrooms was the highest at 4.5%, with the value increasing to 7.3% among 12th graders. This was followed by tranquilizers/sedatives at 2.9%, cocaine at 2.6%, ecstasy (MDMA) at 2.3%, and LSD at 2%, with these values increasing to 4%, 5.2%, 3.7%, and 3.3% among 12th graders respectively (OSDUHS, 2020). Finally, other forms of street drugs (methamphetamines, crack, and fentanyl) were all under 1% among 9th-12th graders. Generally, they found that males were more likely to consume more variety in their substance use than their female counterparts (OSDUHS, 2020). Although some forms of substance use are relatively common, they can have long-lasting effects on the developing brain and may interfere with interpersonal relationships and school performance (Blakemore & Robbins, 2012; Luciana & Ewing, 2015). While some

studies find gender differences, a review of the literature suggests mixed findings in this regard, with some studies not reporting any (e.g., Fleming et al., 2008; Hayre et al., 2019; Kloos et al., 2009).

1.1.3. Depression

The diagnosis and understanding of depression in adolescents have rapidly evolved over the past several decades. In teenagers, depression rates increase after puberty, with depression disproportionately affecting girls more than boys (Jaureguizar et al., 2017; Maughan et al., 2013; Mojtabai et al., 2016; Thapar et al., 2012). What is more concerning is that once adolescents have experienced depression, they are at higher risk of developing a depressive episode in adulthood (Hoertel et al., 2017). There are various risk factors associated with depression, including but not limited to bereavement, separations and conflict, child maltreatment, and peer conflict and bullying (Hankin, 2015; Yeung Thompson & Leadbeater, 2013). What is critical to denote from this is that despite the concerns present with all of the risk factors, peer conflict and bullying is most prevalent in a school environment (Lawrence, 2017).

Rates of depression in adolescent girls are particularly concerning as they are nearly twice as high as in males (Salk et al., 2017). Further, a meta-analysis exploring gender differences for depression determined that depressionogenic symptoms begin earlier than 12 years old for girls, as opposed to starting at 12 years old, providing compelling evidence that depression begins earlier for girls than initially presumed (Salk et al., 2017). There have been various mechanisms considered as to why there are gender differences for depression in teenagers. Research has suggested there are differences in cognitive processing of stressful events and coping styles between genders. Specifically, there may be greater exposure and/or sensitivity to psychosocial stress in teenage girls (Hyde et al., 2008; Lewis et al., 2015). Further, the earlier onset of puberty for girls is a risk factor for developing depression, although it is unclear whether this is due to biological causes or the social implications of early pubertal onset (Angold et al., 1999; Ge et al., 2001; Salk et al., 2017). Another possible explanation for the gender discrepancy is that depression may be more likely to be detected in girls as they seem to present with a more canonical presentation of the disorder, such as depressed mood, whereas boys tend to present with less recognized symptoms of depression, such as the experience of irritable mood (Romans and Clarkson, 2008; Winkler et al., 2006).

Although the experience of depression itself is distressing, it can also be a catalyst for other potential disorders and adverse outcomes if untreated. For example, severe depression has led to suicide attempts (Vergara et al., 2019).

1.1.4. Suicidality

Suicide is a serious public health problem and is the third leading cause of death for youth between the ages of 10 and 24, resulting in approximately 4,600 lives lost each year (Centre for Disease Control and Prevention [CDC], 2018). Further, a nationwide survey conducted in US high-schools found that 16% of students reported seriously considering suicide, 13% reported creating a plan, and 8% reported trying to take their own lives in the 12 months preceding the survey (CDC, 2018). When comparing genders, boys are more likely than girls to die from suicide, with a staggering 79% of reported youth suicide deaths being male and 21% being female (CDC, 2018). On the other hand, girls are more likely to report attempting suicide than boys. Regarding Canadian suicide rates, of the nearly 4,000 individuals who killed themselves in Canada, 500 of them were youth between the ages of 15-24 (Statistics Canada, 2007). Further, suicide is the second leading cause of death among this age group, with 14.7 deaths per 100,000 for males and 5.8 deaths per 100,000 for females (Statistics Canada, 2012). Similar to that of the US, this suggests that males are 3-5 times more likely to complete suicide than females among Canadian youth (Kutcher & Szumilas, 2008). Understanding the factors contributing to suicidality in adolescence and developing preventative and risk reduction programs for this age group is critical.

1.1.5. Attachment, Substance Use, Depression, and Suicidality

A strong case can be made that attachment insecurity is associated with adolescent substance use, depression, and suicidality. In terms of substance use and attachment, evidence in the literature suggests that an insecure parent-child attachment may increase the likelihood adolescents will use and abuse substances (Lindberg & Zeid, 2017; Schindler & Bröning, 2015). This is further exacerbated when adolescents endure further difficulties in their emotional, rational, and academic functioning (Branstetter & Furman, 2013). In contrast, there is evidence in the literature that suggests that parent-child attachment security may protect against substance use among children and adolescents (Hayre et al., 2019; McLaughlin et al., 2016). This is

further supported by Schindler's (2019) article, which stated that multiple longitudinal studies and meta-analyses have confirmed that secure attachment is a protective factor against and insecure attachment is a risk factor for substance use and abuse. Research by Cornellà-Font et al. (2020) examined the relationship between parent-adolescent attachment and the prevalence of substance use and addiction in a normative high-school sample of adolescents between the ages of 13 and 19 years old. They determined that individuals with higher attachment security had lower rates of substance use and addiction. In addition, similar to that of other studies (e.g., Pierrehumbert et al., 2002), they found that attachment insecurity is linked to difficulties in regulating emotions, which can lead adolescents to use substances. In terms of attachment avoidance and anxiety, and substance use, attachment avoidance is significantly positively associated with substance use, whereas attachment anxiety was not associated with increased substance use (Fairbairn et al., 2018; Hayre et al., 2019; Schindler & Bröning, 2015). Further, there is strong evidence that attachment problems predate the onset or increased use of substances. Fairbairn et al.'s (2018) extensive meta-analysis of 665 effect sizes, representing approximately 56,000 participants from 34 samples, revealed evidence of the "temporal precedence" of attachment, indicating that attachment insecurity precedes increases in substance use and this endures across time. In essence, the general theme in the research literature is that attachment security is associated with a decrease in adolescent substance use, and attachment insecurity is associated with and precedes adolescent substance use.

Similarly, attachment insecurity has been linked to an increase in adolescent depressive symptomology. In contrast, research shows that securely attached children can better identify, label, and regulate their emotions compared with insecurely attached children (Brumariu, 2015; Mikulincer & Shaver, 2019). Further, they are more likely to experience depressive symptomology in adolescence (Spruit et al., 2020). Specifically, current research has found that attachment and depression are correlated; however, attachment insecurity is shown to precede depressive symptoms suggesting that attachment insecurity is a risk factor for depression (Spruit et al., 2020). On the other hand, adolescents with a secure attachment to both parents experience less conflict with their parents, less loneliness, fewer feelings of support, and are less likely to develop depressive symptomology (Agerup et al., 2015; Al-Yagon et al., 2016). More directly, research on the detrimental role of attachment insecurity has demonstrated a clear

association with higher levels of depression in teens. The longitudinal study examining a normative high-school sample of adolescents by Agerup et al. (2015) found that an insecure attachment to mothers, fathers, or both were associated with an increased likelihood of experiencing depressive symptomology in adolescence and adulthood. Other studies have indicated similar results when comparing attachment to one or both parents and depressive symptomology (e.g., Keresteš et al., 2019; Madigan et al., 2016; Moretti et al., 2015; Rawatlal et al., 2015; Spruit et al., 2020; Suzuki & Tomoda, 2015). A six-year longitudinal study by Duchesne and Ratelle (2014) explored parental attachment trajectories for mothers and fathers separately and their respective contributions in predicting adolescent depression. They studied and followed a community sample of adolescents starting in grade 6 (age 11) until grade 11 (age 16/17). They found that a secure attachment to mothers, but not fathers, decreased an adolescent's likelihood of developing depressive symptomology. In contrast, a study by Keresteš et al. (2019) found no differences in the strength of the association between maternal or paternal attachment and depression in adolescents. However, they did find that an adolescent's gender moderated the relationship between paternal attachment and depression with more robust associations with females than males. In terms of attachment avoidance and anxiety, empirical evidence has found that both attachment avoidance and anxiety were significantly and positively associated with depression in childhood and adolescence (Brenning et al., 2012; Khan et al., 2020; Zheng et al., 2020). Nonetheless, the general theme in the literature is that a secure attachment to parents predicts a decrease in teenage depression, and an insecure attachment to parents leads to an increase in teenage depression.

Research shows that attachment insecurity is directly associated with suicidality in teens (Zortea et al., 2019). Specifically, research by Sheftall et al. (2014) examined a clinical sample of adolescent attempters and those who have never been suicidal. They found that those who had attempted suicide had higher attachment avoidance and anxiety with their parents than those who had never been suicidal. This research builds upon previous research, and there is more recent research suggesting that an insecure attachment is a risk factor for suicidal thoughts and behaviour (e.g., Dibek & Kurt, 2019; Falgares et al., 2017; Lizardi et al., 2011; Sheftall et al., 2013; Zortea et al., 2019).

There has also been extensive literature exploring the effects of Attachment-Based Family Therapy (ABFT) on adolescent depressive symptoms, including suicidal

thoughts and behaviours (Glenn et al., 2015). ABFT is listed on the National Registry of Evidence-based Program and Practices for depression, and suicidal thoughts and behaviours (Diamond et al., 2019; Glenn et al., 2015). ABFT helps adolescents identify ruptures in their attachment relationship with their parents and follows this by engaging with them to work through these ruptures to increase the teenager's confidence in their parents (Diamond et al., 2019). The intervention's goal is to eventually show the adolescent that their parents are available, supportive, and understanding when the teenager needs assistance in regulating their affect surrounding their depressive symptomology and suicidality (Diamond et al., 2019). Therefore, this suggests that attachment is imperative for adolescents with suicidal thoughts. A meta-analysis conducted by Zortea et al. (2019) found that a secure attachment to parents leads to less suicidal thoughts and behaviours in adults and adolescents. Further, an insecure attachment to parents leads to an increase in suicidal thoughts and behaviours. Finally, they examined gender differences in their analysis and determined that although there are differences in suicidality for males and females, there is insufficient evidence to draw any conclusions for gender differences in their attachment to parents and their suicidality. Generally, the literature has determined that parent-adolescent attachment security can lead to the prevention of and/or reduction in suicidal thoughts and behaviours in teens whereas, parent-adolescent attachment insecurity can lead to an increase in suicidality in teens.

1.1.6. School Connectedness

School provides adolescents with an avenue for their education and provides a significant opportunity for their cognitive, social, and emotional development. School provides teenagers with the chance to separate themselves from their parents in a bid to garner more autonomy and dictate their development through the amount they engage with their school (Melvin et al., 2019). Further, school provides an environment where adolescents are likely to meet their first intimate companions, meet like-minded peers, build relationships with their teachers, coaches, etc., and take the chance to be more autonomous in their decision-making. Additionally, school provides a new array of challenges, such as making those prosocial connections, seeking and understanding romantic relationships, and facing difficulties surrounding the variety in academic work.

Therefore, teenagers may unintentionally not realize the impact school has on them and their lives moving forward.

In contrast to the possible benefits afforded to teens who attend schools, school may also place adolescents “at-risk” by not preparing them adequately with the appropriate academic skills. Further, as adolescents are given more autonomy in school, the new environment may create more struggles for the developing youth. These struggles may include bullying, which has been linked to creating disengagement and pushes adolescents to not want to attend school (Fink et al., 2018). Therefore, schools can create an environment that may breed connectedness or disconnectedness for the developing adolescent.

School connectedness has been operationalized in a review conducted by Barber and Schluterman (2008) and later in a review article by García-Moya et al. (2019). They described school connectedness to include three distinct components – interpersonal relationships, relationship to the school, and attitudes towards school importance. In essence, when teased apart further, school connectedness may include social affiliations, school belonging, perspective about school importance, and a supportive learning environment (Barber & Schluterman, 2008; García-Moya et al., 2019; Marraccini & Brier, 2017). Social affiliations are best described by feeling cared for and respected as an individual by the adults in the school, and the teenagers feel they can speak to them on perceived level terms. Attitude about school importance can be best described as caring about and trying to do their best at school. Finally, supportive learning environments can be best described as places where the teenager feels they are being treated fairly and where the teachers are providing clear instructions with appropriate expectations. Adolescents who feel connected to their school are likely to earn high grades, feel supported, engage in more prosocial behaviours and are more likely to complete more years of schooling (Pate et al., 2017; Oldfield et al., 2016). Furthermore, if adolescents perceive a connection to their school, emotional distress is less likely to affect their educational attainment and school performance (Pate et al., 2017). For example, a research study conducted by Oldfield et al. (2018) questioned whether school connectedness either promotes or suppresses resilience to mental health outcomes among an at-risk adolescent population. They found that school connectedness was a significant predictor of mental health resilience and an increased sense of belonging, self-identity, prosocial skills, and academic success.

In contrast, adolescents who are disconnected from school are more likely to do poorly academically, feel less supported by teachers and peers, feel incapable of connecting with others through prosocial behaviours, may develop mental health problems and are likely to skip school and potentially drop-out (Hancock et al., 2018; Keppens & Spruyt, 2019; Melvin et al., 2019; Nielson et al., 2017; Pikulski et al., 2020). A seminal longitudinal research study conducted by Bond and colleagues (2007) examined the effects of school connectedness on adolescent mental health, substance use, and academic achievement over a 2-4-year span. They found that teenagers that endorsed low school connectedness were more likely to experience interpersonal conflicts in the early years of schooling. In addition, they were more likely to experience mental health problems and use substances in the later years of schooling. Further, low school connectedness was linked to poor academic achievement and risk-taking behaviours. In contrast, they found that school connectedness was linked with good mental health outcomes and prosocial connectedness. Therefore, low school connectedness can have detrimental effects on adolescent development, whereas high school connectedness can be beneficial for adolescent development.

In terms of gender differences and school connectedness, several studies have indicated that girls are more connected to their schools than boys (e.g., Loukas et al., 2016; Loukas et al., 2012; Simons-Mortons et al., 1999). However, research on changes in school connectedness throughout adolescence is mixed. Some studies suggest that school connectedness decreases similarly across boys and girls (Loukas et al., 2016; Wang & Dishion, 2012). Others indicated that decreases are more prevalent for girls than boys (Bolland et al., 2016; Simons-Mortons & Chen, 2009). This suggests that further research is needed in understanding gender differences and school connectedness. The current study explored the effects of school connectedness across the full sample and the male and female subsamples separately to examine whether the pattern of results is similar.

1.2. Current Study

Researchers have examined school connectedness as a protective factor and its absence as a risk factor. Further, past research has examined school connectedness and its direct relationships with children and adolescent health outcomes, as well as the moderating role it may play with other risk factors and their impacts (e.g., Barber &

Olsen, 1997; Loukas et al., 2010; Wilkinson-Lee et al., 2011). However, there are limited studies examining the effects of school connectedness and adolescent health outcomes (Pate et al., 2017). Concerning the current study, attachment security may buffer important adolescent stressors, such as school connectedness. Likewise, attachment insecurity may increase susceptibility to the negative effects of low school connectedness.

The literature shows that teens who report low attachment security with parents are more likely to use substances, experience depression, and suicidality. Specifically, some studies have explored the moderating effects of school connectedness on the relationship between poor quality family relations and adolescent outcome variables such as conduct problems and emotional distress (e.g., Barber & Olsen, 1997; Loukas et al., 2010; Wilkinson-Lee et al., 2011). Other studies have explored the impact of school connectedness and attachment relationships on adolescent outcome variables such as mental health outcomes, emotional adjustment, and resilience (e.g., Oldfield et al., 2018; Oldfield et al., 2016; Shochet et al., 2008). Despite this, there is limited research on the moderating effects of school connectedness on the relationship between parent-adolescent attachment security, substance use, depression, and suicidality. Further, most of the research conducted on this population with these variables has been conducted on a normative high-school sample. Therefore, this study provided a unique opportunity to examine a clinical adolescent sample instead of a normative one. This study examined the extent to which school connectedness moderates the individual relationships between attachment and adolescent substance use, depression, and suicidality.

Given research to date, I anticipate that prior associations between attachment security and substance use, depression and suicidality will be replicated. Similarly, I predict that school connectedness will also be associated with these outcomes. I anticipate school connectedness will moderate the association between secure attachment and mental health outcomes, such that low school connectedness will weaken the association between secure parent-adolescent attachment and adolescent substance use, depression, and suicidality. In contrast, a parallel examination of two dimensions of attachment insecurity (avoidance and anxiety) and their relationships with school connectedness and the outcomes were also explored. Similar to the prediction above, I anticipate that low school connectedness will exacerbate the association

between the two dimensions of attachment insecurity and the outcome variables. Finally, potential differences in associations between study variables by sex were examined. No apriori hypotheses are offered given the high degree of mixed findings in the literature regarding sex differences.

Chapter 2.

Methods

2.1. Participants and Procedures

Participants were a subsample of teens drawn from a large-scale evaluation of the effectiveness of an attachment-based parent program for caregivers of teens experiencing severe emotional and/or behavioural difficulties (Connect; Moretti et al., 2017). Caregivers and parents of these teens were referred by urban and rural community mental health agencies, schools, and hospitals due to serious concerns about their teen's mental health and behavioural functioning. Caregivers and parents provided consent (N = 967) for participation in this study, and their teens were also invited to participate. Teens interested in participating provided assent (N = 650), and they provided the intervention baseline self-report data used in the present study. Teens were instructed to complete their questionnaire packages on their own using either hard copy or online questionnaires. If they chose hard copy questionnaires, they were provided with their own envelopes that they were instructed to seal to keep their information separate from their parents. A research assistant was in touch with teens during the study and, if needed, provided assistance by phone, reading each item aloud as they completed their questionnaires. Of the 650 teens who participated, only those between the ages of 12 and 18 were included (N = 480; 60.5% female; Mage = 14.86, SD = 1.59). Given the age range of other studies examining substance use (e.g., OSDUHS, 2020; Peled et al., 2020) and low base rates of use in children under 12 years, the current study examined adolescents ranging from 12-18 years of age. Of this sample, 89% of adolescents reported they are currently attending school, 7% reported they are not currently attending (e.g., summer break), and 4% did not report information. Parents reported youth demographics: 63.9% as White, 14.4% Indigenous (inclusive of First Nations, Metis, Inuit), 5.4% Asian, 8.0% were categorized as “Other” (e.g., infrequent responses) or Mixed identity, and 8.4% did not report information. Exclusion criteria included the presence of a major mental illness (e.g., schizophrenia) or low IQ as reported by the parent. All research protocols and procedures received approval from the Office of Research Ethics at Simon Fraser University.

2.2. Measures

For this study, select measures administered at Time 1 were included. The following measures are reliable and valid measures that have been used in previous research.

2.2.1. AAAAI – Adolescent Attachment Anxiety and Avoidance Inventory

The Adolescent Attachment Anxiety and Avoidance Inventory (AAAAI previously APAI; (Moretti & Obsuth, 2009) is a 36-item measure of adolescent parent attachment adapted from the Experiences in Close Relationships (Brennan et al., 1998). Consistent with the ECR and other self-report measures of attachment, super-ordinate factors tapping secure attachment, attachment anxiety, and attachment avoidance have been confirmed (Moretti & Obsuth, 2009; Moretti et al., 2015; Steiger et al., 2009). The present study adopted a modified version with 16 items averaged to assess overall secure attachment, with some items reverse-scored to fulfill this requirement. Further, both dimensions of attachment insecurity, attachment anxiety (7-items; e.g., “I worry about being abandoned by my parent”) and attachment avoidance (9-items; e.g., “I usually discuss my problems and concerns with my parent”, reverse coded) were included, drawing on those with the highest factor loadings in prior research. Youth reported on their relationship with their parent over the past six months on a 7-point scale (1 ‘strongly disagree’ to 7 ‘strongly agree’). In this sample, the items loaded on two factors, replicating the factor structure in previous work (Moretti et al., 2015; Vernon, 2020). Internal consistency was good to excellent for total secure (α=0.86), (avoidant (α=0.90), and anxious (α=0.84) attachment.

2.2.2. SCS – School Connectedness Scale

The School Connectedness Scale (SCS) questions are taken from the original National Longitudinal Study of Adolescent Health Study (Add Health; McNeely et al., 2002; Resnick et al., 1997). Add Health is a longitudinal study of a nationally representative sample of over 20,000 adolescents, beginning in 1994-95 when they were in grades 7-12 and continued for five waves with the most recent in 2016-18. The data collected has featured survey data from participants and their parents across

various contexts, including demographic, familial, behavioural, socioeconomic, cognitive, psychosocial, and health survey data. One of the many measures in the Add Health survey was the SCS and has been utilized in several published manuscripts (e.g., Joyce & Early, 2014; O'Brennan & Furlong, 2010; Pate et al., 2017). This scale addresses a couple of different aspects of school, one of which is school connectedness and is measured with five items. The items were scored on a 5-point Likert scale and assessed participants' subjective feelings of school connectedness and included items such as "you feel close to people at school", "you feel part of the school", and "the teachers at school treat you fairly". In order to create the school connectedness scale, these items were reverse coded as necessary and summed to create a scale ranging from 5 to 25, where higher scores indicated higher school connectedness. This coding scheme is similar to previously published work using Add Health data (e.g., Markowitz, 2017; McNeely & Falci, 2004; McNeely et al., 2002) and had good internal reliability in the present study (Cronbach's α = .71).

2.2.3. Substance Use

Substance use was measured with the Tobacco, Alcohol, and Drugs Survey-Version 3, a 57-item instrument based on measures from the National Longitudinal Study of Adolescent Health (Bureau of Labor Statistics, US Department of Labor, 2011). The present study included four items with youth reporting on their frequency of cigarette smoking, alcohol consumption, marijuana smoking, and other drugs (e.g., cocaine, heroin, ecstasy) over the past 30 days. Youth reported the number of days in the past month each substance was used in terms of the following categories: were rated on a 7-point scale (0 = '0 days'; 1 = '1–2 days'; 2 = '3–5 days'; 3 = '6–9 days'; 4 = '10–19 days'; 5 = '20–29 days'; 6 = 'all 30 days'). A table showing the youth reported substance use frequency is presented in the Appendix. For this study, items were re-coded (0 = 'no use'; 1 = 'use') for each substance and then summed across all four substances for a new scale that tapped the total number of different substances used during the past 30 days (0 = 'no use'; 1 = '1 substance used'; 2 = '2 substances used'; 3 = 3 substances used'; 4 = 'all substances used' in the past 30 days). An estimate of internal-consistency reliability is equal to .72 in this study.

2.2.4. BCFPI – The Brief Child and Family Phone Interview

The Brief Child and Family Phone Interview (BCFPI; Cunningham et al., 2000) was developed as a service evaluation and standardized assessment tool. Originating from the Ontario Child Health Study scales (OCHS), the BCFPI includes many common items with the CBCL (Boyle et al., 1993). In the current study, the BCFPI youth self-report scales were administered in paper format. These scales possess excellent psychometric properties and have been used in large-scale epidemiological studies (e.g., Boyle et al., 2009; Jarbin et al., 2017; Lau et al., 2019). Six domains of functioning related to DSM-IV diagnoses are examined in the BCFPI: Attention-deficit hyperactivity disorder (ADHD), oppositional defiant disorder (ODD), conduct disorder (CD), separation anxiety disorder (SAD), generalized anxiety disorder (GAD), and major depression (MDD). The BCFPI generates three compositive scores: total problems, externalizing problems, and internalizing problems. For this study, the MDD domain was examined. The total problems composite scores for depression and suicidality at pre-treatment were utilized and were obtained from the MDD domain. Youth reported on their experiences of depression (6-items; e.g., “feel hopeless” and “have no interest in usual activities”) and suicidality (3-items; e.g., “expressed thoughts of wanting to end your life” and “made plans to end your life”). Each item was rated on a 3-point scale (1 ‘*never*’ to 3 ‘*often*’), re-coded for study (0 ‘*never*’ to 2 ‘*often*’). Apart from CD, previous studies have shown estimates of internal-consistency reliability that exceed .80 for all BCFPI sub-scales and DISC-IV symptom counts (Boyle et al., 2009). Specifically, for this sample, an estimate of internal consistency reliability for the depression sub-scale is equal to .90, and for the suicidality sub-scale is equal to .86. T-scores, standardized based on a distribution with a mean of 50 and a standard deviation of 10, are used to determine clinical thresholds of adolescents in the sample. T-scores of 70 or above (two or more standard deviations above the mean) are considered in the clinical range (Cunningham, Pettingill, & Boyle, 2006). The number of youths presenting with clinical levels of the MDD domain at pre-treatment (>70 score) equated to 32.7% (N = 157), and those reporting at the subclinical level (>65 but <70 score) equated to 9.0% (N = 43) of the current sample. For this study, raw scores were used to differentiate between the depression and suicidality items in this measure.

2.3. Data Analytic Plan

The present study examined descriptive statistics of all the variables through SPSS version 24 (IBM Corp., 2016); all other analyses were conducted using Mplus 8.0 (Muthén & Muthén, 2017). Before conducting analyses pertaining to the hypotheses, assumptions were checked, and data were screened for missing data points, data entry errors, non-normality, and outliers. No extreme outliers were detected, and variables approximated normality. Missing data were handled using maximum likelihood (ML) estimation, and there was low missingness across the study variables (full sample: .5-3.9%; male sample: .6-3.9%; female sample: 0-3.8%; Little & Rubin, 1987). Model fit was assessed by examining the models' chi-square ($\chi 2$) value, Root Mean Square Error of Approximation (RMSEA) and Comparative Fit Index (CFI). Models with non-significant $\chi 2$ value, RMSEA less than .06, and CFI greater than .90 indicate adequate fit (Hu & Bentler, 1999). Concerning the current study, the model fit was 'just-identified' for all study models, and therefore, was not reported. 'Just-identified' suggests the number of observed parameters was equal to the number of estimated parameters with degrees of freedom = 0, and thus, the model fit could not be assessed; this has previously been encountered in other reports, and it does not interfere with the ability to interpret results (see Bamber & Van Santen, 2000; Pasalich et al., 2016). Main study hypothesis analyses were conducted using 10,000 bootstrapped samples, and statistical significance was determined by 95% bias-corrected bootstrapped confidence intervals (CI) that do not contain zero. Mplus syntax for the moderation analyses was adapted from Stride et al. (2015). For each dependent variable (i.e., substance use, depression, and suicidality), a direct effect model and a moderation model were conducted separately. Secure attachment and school connectedness were first modelled as predictors in the direct and moderation models for each dependent variable. These analyses were then followed by models in which attachment avoidance and anxiety were introduced into the analyses in place of secure attachment to examine how the dimensions of insecure attachment and school connectedness related to each independent variable. Predictors were covaried for the direct effect analyses; however, they were not covaried for the moderation analyses due to poor model fit. The predictor variables were mean-centred, and the interaction term was created from the product of each of the centered attachment variables with the centred school connectedness variable. Significant interaction effects were assessed using a post-hoc simple slope

analysis to examine the relationship between the predictor (attachment) and outcome variables at lower (-1*SD*), moderate (mean), and higher levels (+1*SD*) of the moderating variable (school connectedness). The models were conducted for youth-report of the full sample and separately for male and female youth.

Chapter 3.

Results

3.1. Descriptives

Bivariate correlations and mean and standard deviations of study variables are shown for the full sample in Table 3.1 and male and female youth in Table 3.2. Based on the full sample, the majority of youth (87.1%) reported experiencing at least some degree of depressive symptomology in their lifetime; 54.8% of youth reported experiencing at least some degree of suicidality in their lifetime, and 38.7% of youth reported using at least some substances within the past 30 days. Specifically, 23% of youth reported cigarette use; 25% reported alcohol use; 26% reported marijuana use; and 6% reported ‘other drug’ use, within the past 30 days (see Table in Appendix).

Table 3.1. Descriptive Statistics and Correlations between Study Variables for Full Sample

Variable	1	2	3	4	5	6	7	*M*	*SD*	*Range*
1. Secure attachment	1							4.57	1.08	1.19-7.00
2. Attachment avoidance	-.86***	1						3.97	1.47	1.00-6.89
3. Attachment anxiety	-.67***	.20***	1					2.73	1.28	1.00-7.00
4. School connectedness	.33***	-.30***	-.20***	1				16.49	4.61	3.00-25.00
5. Substance use	-.19**	.23***	.05	-.13**	1			.83	1.23	.00-4.00
6. Depression	-.45***	.37***	.33***	-.47***	.22***	1		5.40	3.61	.00-12.00
7. Suicidality	-.36***	.31***	.25***	-.29***	.26***	.70***	1	1.52	1.82	.00-6.00

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

Table 3.2. Descriptive Statistics and Correlations between Study Variables for Male and Female Sample

Variable	1	2	3	4	5	6	7	Male Youth			Female Youth		
								M	*SD*	*Range*	*M*	*SD*	*Range*
1. Secure attachment	1	-.85***	-.63***	.42***	-.13	-.42***	-.31***	4.73	.96	2.06-7.00	4.47	1.14	1.19-7.00
2. Attachment avoidance	-.87***	1	.13	-.36***	.19*	.30***	.25**	3.86	1.34	1.00-6.67	4.04	1.54	1.00-6.89
3. Attachment anxiety	-.68***	.23***	1	-.28***	-.03	.35***	.22**	2.51	1.17	1.00-6.14	2.88	1.32	1.00-7.00
4. School connectedness	.27***	-.26***	-.14*	1	.14	-.47***	-.29***	16.97	4.51	3.00-25.00	16.22	4.61	4.00-25.00
5. Substance use	-.21**	.24**	.06	-.11	1	.22*	.27*	.63	1.11	.00-4.00	.97	1.30	.00-4.00
6. Depression	-.45***	.40***	.30***	-.47***	.18***	1	.65***	4.04	3.26	.00-12.00	6.24	3.55	.00-12.00
7. Suicidality	-.36***	.33**	.23*	-.27***	.23***	.68***	1	.77	1.36	.00-6.00	1.97	1.90	.00-6.00

Note. Correlation coefficients for Males are above the diagonal and for Females below the diagonal. * $p < .05$, ** $p < .01$. *** $p < .001$.

3.2. Substance Use

3.2.1. Direct and Moderation Effects

Entering both secure attachment and school connectedness as predictors of substance use revealed that secure attachment was significantly associated with less substance use in the full sample and among females, but not among males (See Table 3.3). School connectedness was not significantly associated with substance use. Testing moderation effects, analyses showed that the interaction between secure attachment and school connectedness was not significant. Examining attachment dimensions specifically, revealed that attachment avoidance was significantly associated with more substance use in the full sample and males and females. The interaction between attachment avoidance and school connectedness was not significant, failing to support a moderation effect. In contrast, neither attachment anxiety nor school connectedness was significantly associated with substance use; testing the moderation effect determined that no interaction effect was found.

3.3. Depression

3.3.1. Direct and Moderation Effects

Entering both secure attachment and school connectedness as predictors of depression revealed that both predictors were significantly associated with fewer symptoms of depression in the full sample and among both males and females (see Table 3.4). In testing the moderation effect, analyses showed that the interaction between secure attachment and school connectedness was not significant in the full sample or among males; however, there was a significant interaction among females (see Figure 3.1). A post-hoc simple slope analysis determined the moderation was significant at all three levels [(-1SD; low), (mean; moderate), (+1SD; high)] of school connectedness (see Table 3.6). Specifically, this result indicates that when adolescent females reported low attachment security, depression was high across all levels of school connectedness. Conversely, at high levels of secure attachment, high school connectedness predicted lower depressive symptoms, while low school connectedness predicted significantly higher levels of depressive symptoms. This result suggests the presence of a synergistic effect between attachment security and school connectedness.

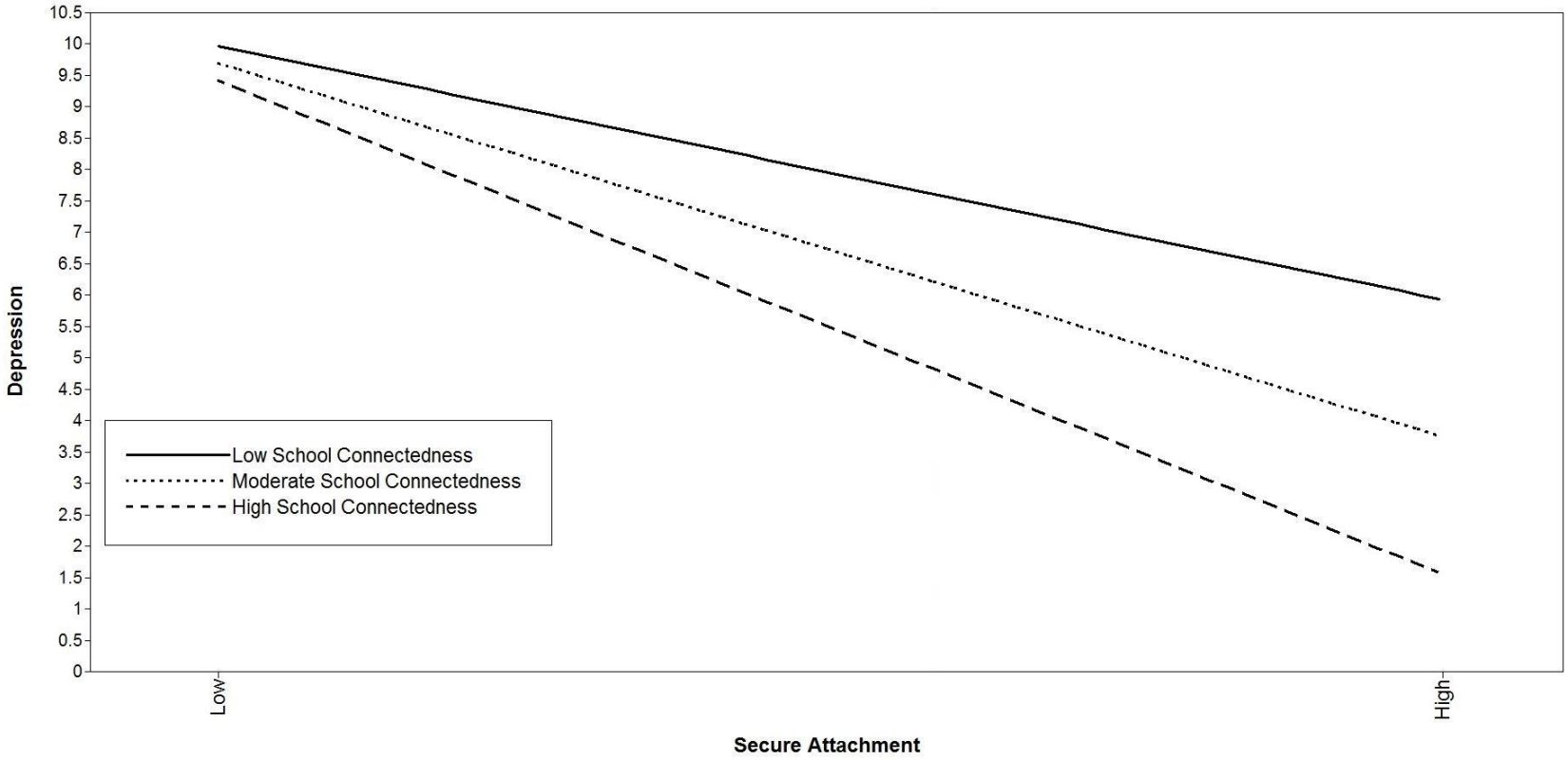

Figure 3.1. Interaction Effect between School Connectedness and Secure Female Adolescent Attachment on Depression

Note. Simple slopes of secure female adolescent attachment predicting depression for 1*SD* below the mean of school connectedness, the mean of school connectedness, and 1*SD* above the mean of school connectedness; the X-axis "low" refers to the "min", and the "high" refers to the "max" of the secure attachment variable.

Examining attachment dimensions specifically, revealed that attachment avoidance and attachment anxiety were significantly associated with more symptoms of depression in the full sample, and among both males and females; the interaction between attachment avoidance and school connectedness was not significant, failing to support a moderation effect. In contrast, there was a significant interaction between attachment anxiety and school connectedness for the full sample and among females (see Figures 3.2 and 3.3). The post-hoc simple slope analysis determined the moderation was significant at all three levels of school connectedness. Specifically, this result indicates that when adolescent females reported low attachment anxiety, low school connectedness predicted higher depressive symptoms, while high school connectedness predicted significantly lower levels of depressive symptoms. Conversely, at high levels of attachment anxiety, depression was high across all levels of school connectedness.

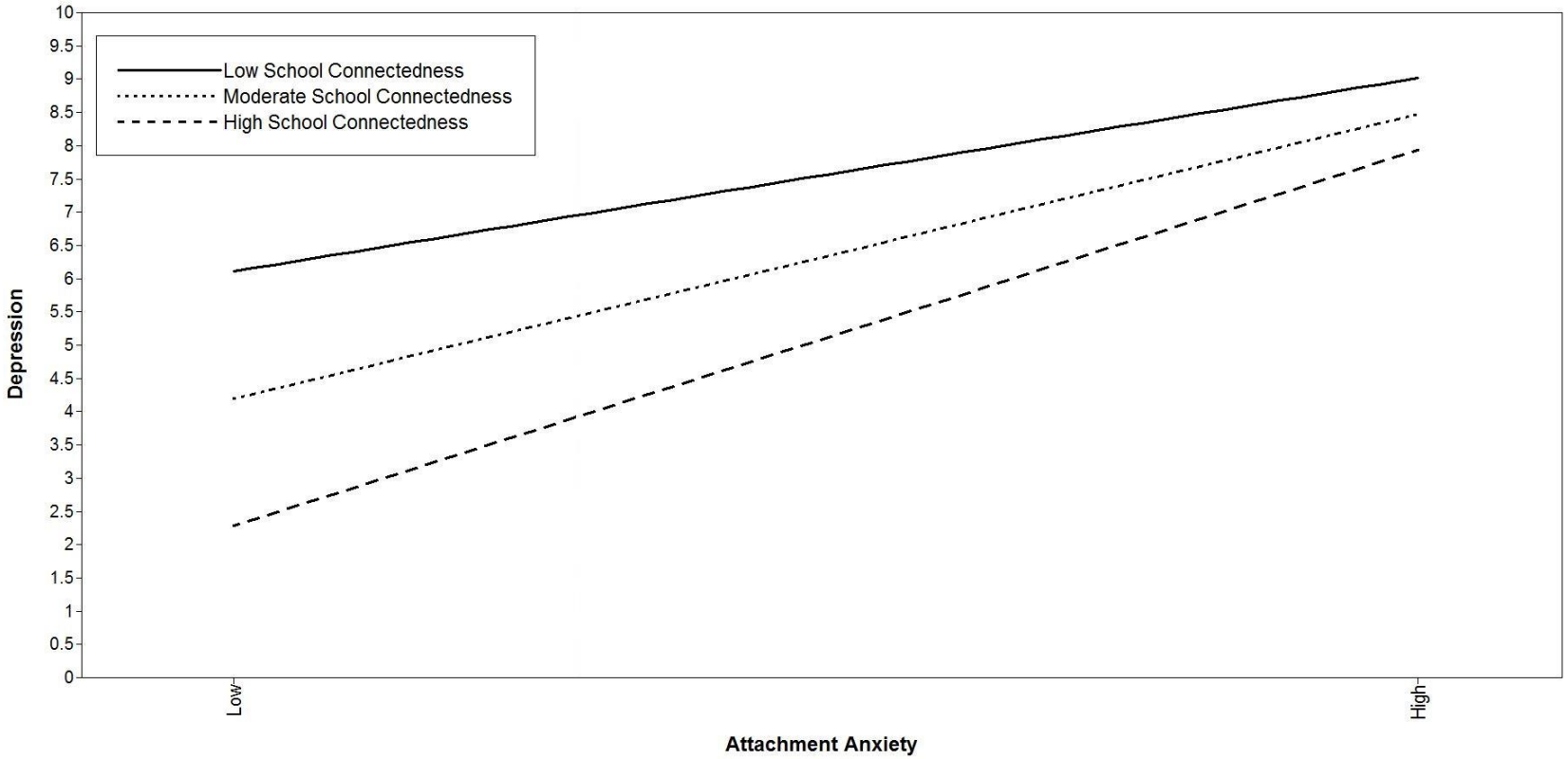

Figure 3.2. Interaction Effect between School Connectedness and Adolescent Attachment Anxiety on Depression

Note. Simple slopes of attachment anxiety predicting depression for 1*SD* below the mean of school connectedness, the mean of school connectedness, and 1*SD* above the mean of school connectedness; the X-axis "low" refers to the "min", and the "high" refers to the "max" of the attachment anxiety variable.

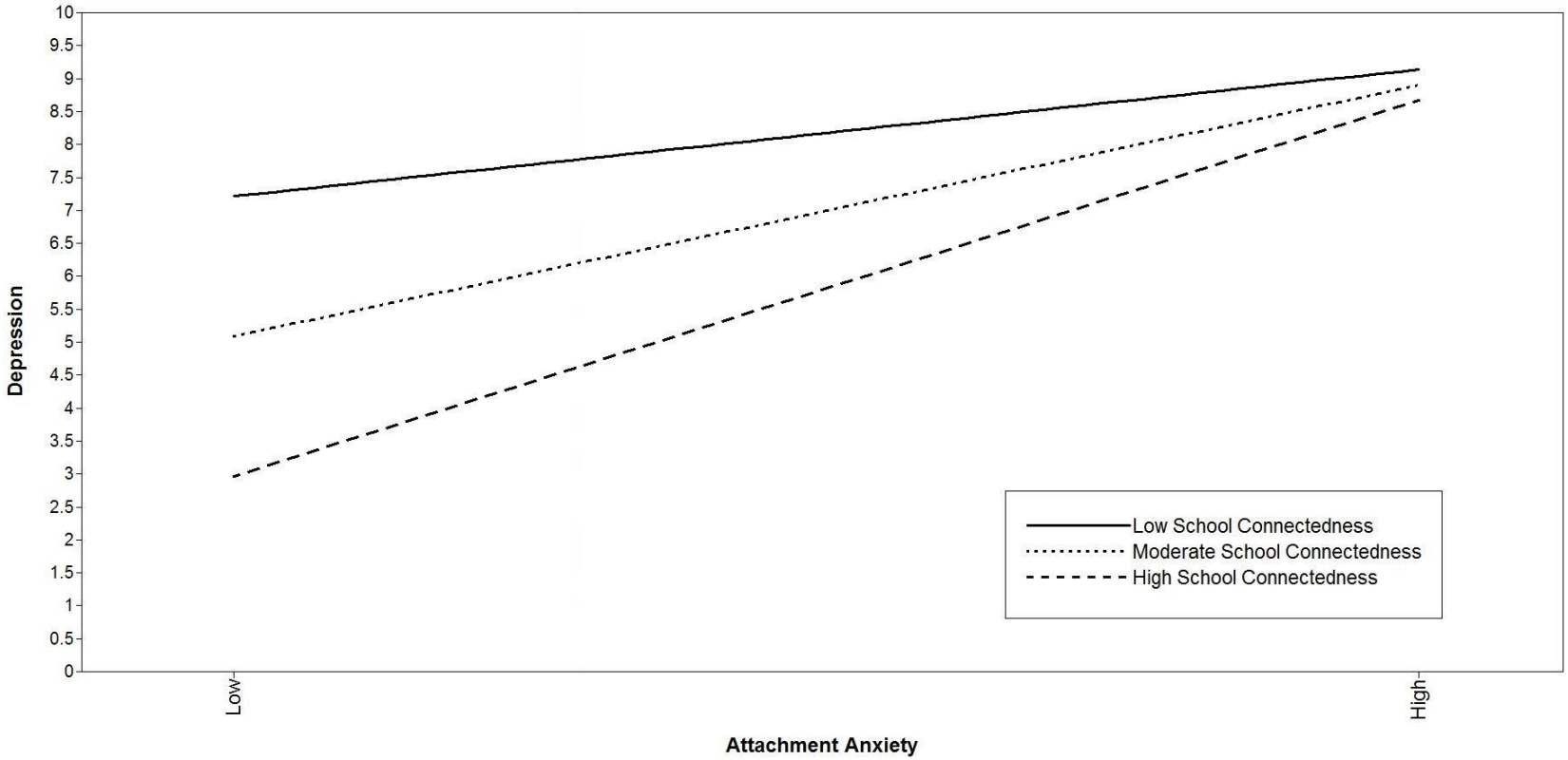

Figure 3.3. Interaction Effect between School Connectedness and Female Attachment Anxiety on Depression

Note. Simple slopes of female attachment anxiety predicting depression for 1*SD* below the mean of school connectedness, the mean of school connectedness, and 1*SD* above the mean of school connectedness; the X-axis "low" refers to the "min", and the "high" refers to the "max" of the attachment anxiety variable.

3.4. Suicidality

3.4.1. Direct and Moderation Effects

Entering both secure attachment and school connectedness as predictors of suicidality revealed that secure attachment and school connectedness were significantly associated with fewer suicidality symptoms in the full sample and among both males and females (see Table 3.5). In testing the moderation effect, analyses showed that the interaction between secure attachment and school connectedness was not significant in the full sample and among females; however, there was a significant interaction among males (see Figure 3.4). The post-hoc simple slope analysis determined the moderation was significant at the low (-1SD) and moderate (mean) levels of school connectedness, but not at the high (+1SD) level. Specifically, this result indicates that when adolescent males reported low attachment security, low levels of school connectedness predicted higher levels of suicidality, while moderate school connectedness predicted lower levels of suicidality. In contrast, at high levels of attachment security, suicidality was low across the low and moderate levels of school connectedness. High school connectedness did not moderate the relationship between secure attachment and suicidality.

Examining attachment dimensions specifically, revealed that attachment avoidance and attachment anxiety were significantly associated with more suicidality symptoms in the full sample, and among both males and females; the interaction between attachment anxiety and school connectedness was not significant, failing to support a moderation effect. In contrast, there was a significant interaction between attachment avoidance and school connectedness among males (see Figure 3.5). The post-hoc simple slope analysis determined the moderation was significant at the low and moderate levels of school connectedness, but not at the high level. In particular, at lower levels of attachment avoidance, suicidality was low across the low and moderate levels of school connectedness. However, at higher levels of attachment avoidance, low school connectedness predicted higher levels of suicidality, while moderate school connectedness predicted lower levels of suicidality. High school connectedness did not moderate the relationship between attachment avoidance and suicidality.

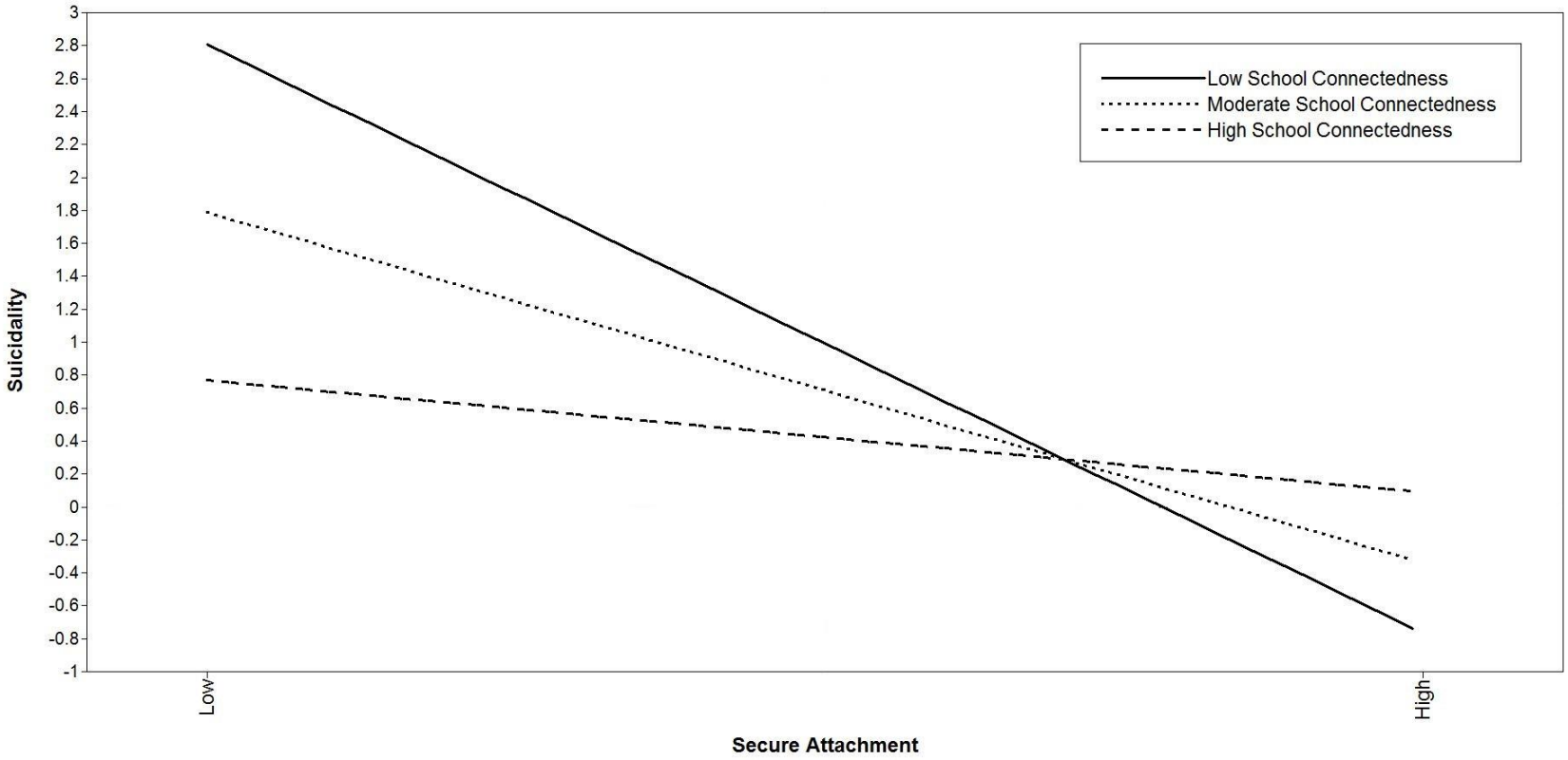

Figure 3.4. Interaction Effect between School Connectedness and Secure Male Adolescent Attachment on Suicidality

Note. Simple slopes of secure male adolescent attachment predicting suicidality for 1*SD* below the mean of school connectedness, the mean of school connectedness, and 1*SD* above the mean of school connectedness; the X-axis "low" refers to the "min", and the "high" refers to the "max" of the secure attachment variable.

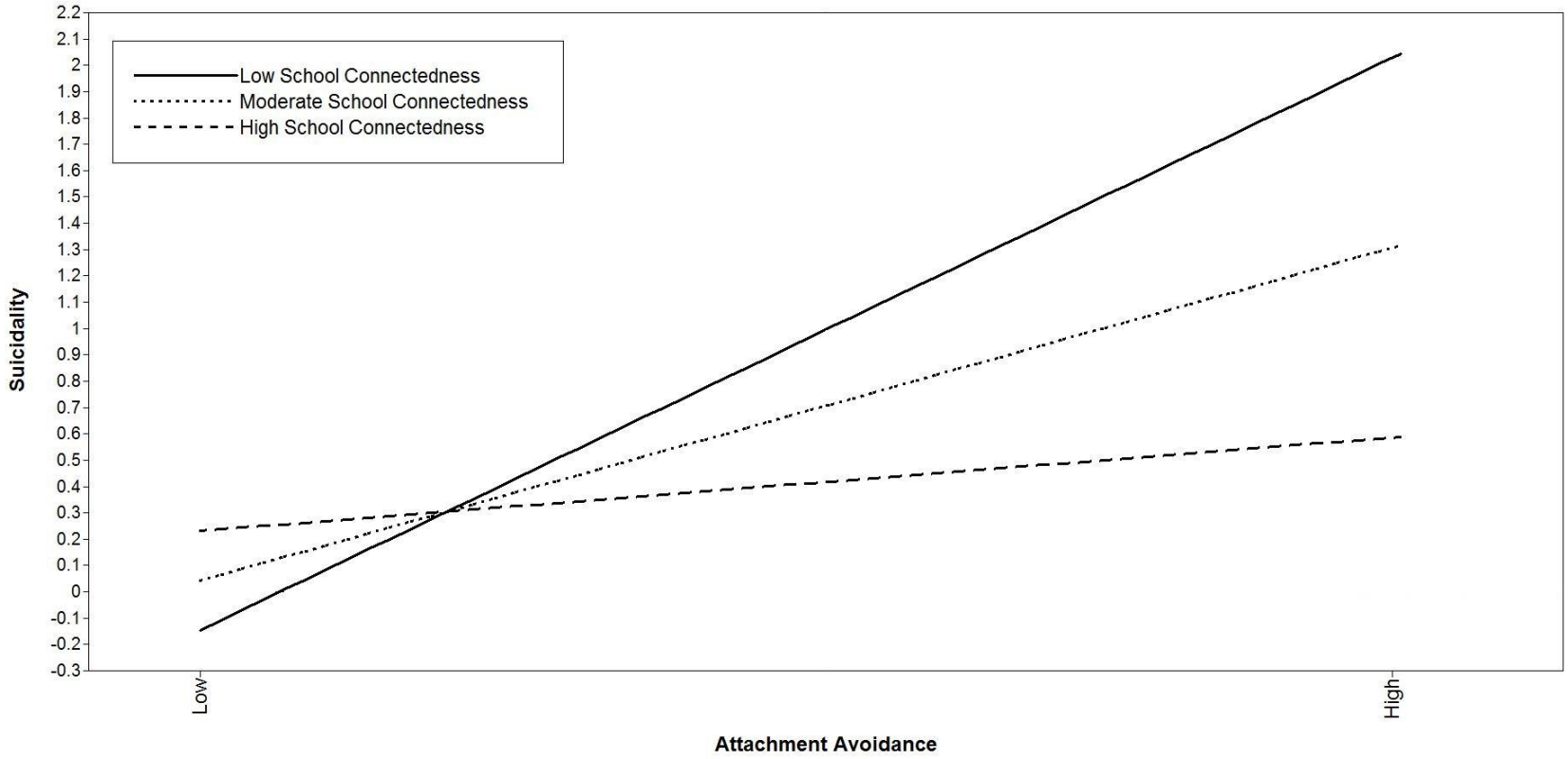

Figure 3.5. Interaction Effect between School Connectedness and Male Attachment Avoidance on Suicidality

Note. Simple slopes of male attachment avoidance predicting suicidality for 1*SD* below the mean of school connectedness, the mean of school connectedness, and 1*SD* above the mean of school connectedness; the X-axis "low" refers to the "min", and the "high" refers to the "max" of the attachment avoidance variable.

Table 3.3. Direct and Moderation Effects of Attachment and School Connectedness on Substance Use

	All Youth			Male			Female		
Model	*B* (*SE*)	β	95% CI	*B* (*SE*)	β	95% CI	*B* (*SE*)	β	95% CI
Direct Effects (Covaried)									
Secure attachment	-.192(.053)	-.168	-.278, -.104*	-.092(.100)	-.079	-.259, .070	-.214(.065)	-.189	-.321, -.108*
School connectedness	-.019(.013)	-.072	-.042, .003	-.025(.023)	-.102	-.063, .013	-.018(.018)	-.064	-.047, .011
Attachment avoidance	.173(.043)	.205	.100, .243*	.128(.066)	.155	.022, .243*	.189(.056)	.224	.096, .281*
Attachment anxiety	-.009(.050)	-.009	-.090, .075	-.089(.084)	-.093	-.225, .050	-.001(.062)	-.001	-.102, .102
School connectedness	-.018(.014)	-.067	-.040, .004	-.026(.024)	-.106	-.064, .013	-.016(.018)	-.057	-.045, .014
Moderation Effects									
Secure attachment	-.191(.053)	-.169	-.280, -.106*	-.101(.104)	-.089	-.274, .069	-.180(.056)	-.158	-.308, -.096*
School connectedness	-.020(.013)	-.076	-.042, .001	-.027(.023)	-.115	-.066, .009	-.054(.062)	-.012	-.043, .015
Interaction	.002(.011)	.009	-.016, .022	-.007(.019)	-.032	-.038, .025	.041(.064)	.041	-.014, .039
Attachment avoidance	.169(.041)	.202	.101, .236	.147(.068)	.182	.039, .264*	.178(.052)	.212	.091, .262*
School connectedness	-.020(.013)	-.074	-.041, .002	-.025(.021)	-.105	-.059, .009	-.016(.018)	-.063	-.044, .014
Interaction	-.001(.009)	-.006	-.016, .013	-.007(.014)	-.043	-.032, .015	-.001(.011)	-.006	-.021, .017
Attachment anxiety	.022(.047)	.023	-.055, .101	-.088(.087)	-.076	-.212, .062	.033(.060)	.034	-.067, .130
School connectedness	-.035(.013)	-.131	-.057, -.014*	-.148(.095)	-.033	-.079, -.001*	-.028(.018)	-.098	-.056, .003
Interaction	.003(.010)	.014	-.015, .020	.137(.105)	.024	-.008, .060	-.012(.014)	-.054	-.036, .012

Note: Lines indicate a separation of models; * indicates significance

Table 3.4. Direct and Moderation Effects of Attachment and School Connectedness on Depression

	All Youth			Male			Female		
Model	*B* (*SE*)	β	95% CI	*B* (*SE*)	β	95% CI	*B* (*SE*)	β	95% CI
Direct Effects (Covaried)									
Secure attachment	-1.091(.145)	-.327	-.396, -.255*	-.907(.236)	-.267	-1.274, -.498*	-1.083(.175)	-.349	-1.361, -.785*
School connectedness	-.288(.032)	-.368	-.433, -.301*	-.253(.048)	-.350	-.330, -.253*	-.288(.043)	-.376	-.358, -.218*
Attachment avoidance	.523(.107)	.212	.342, .697*	.353(.160)	.145	.084, .613*	.596(.130)	.258	.378, .809*
Attachment anxiety	.616(.114)	.217	.424, .802*	.644(.191)	.232	.328, .955*	.502(.142)	.187	.266, .732*
School connectedness	-.288(.033)	-.367	-.340, -.234*	-.247(.049)	-.343	-.326, -.166*	-.289(.043)	-.376	-.358, -.218*
Moderation Effects									
Secure attachment	-1.080(.144)	-.324	-1.318, -.844*	-.981(.265)	-.288	-1.404, -.535*	-1.042(.172)	-.336	-1.317, -.750*
School connectedness	-.287(.031)	-.371	-.337, -.233*	-.259(.049)	-.361	-.342, -.178*	-.302(.043)	-.398	-.368, -.302*
Interaction	-.033(.027)	-.048	-.076, .011	.028(.042)	.042	-.047, .092	-.071(.038)	-.106	-.131, -.071*
Attachment avoidance	.597(.109)	.243	.413, .772*	.410(.178)	.167	.113, .704*	.655(.130)	.285	.435, .655*
School connectedness	-.316(.033)	-.407	-.370, -.262*	-.297(.050)	.-.409	-.379, -.297*	-.310(.043)	-.408	-.378, -.236*
Interaction	.025(.020)	.050	-.008, .058	-.003(.027)	-.007	-.048, .043	.047(.028)	.094	-.002, .092
Attachment anxiety	.713(.117)	.252	.521, .904*	.648(.195)	.231	.329, .969*	.245(.054)	.654	.410, .889*
School connectedness	-.329(.031)	-.423	-.380, -.329*	-.289(.054)	-.398	-.377, -.202*	-.451(.050)	-.342	-.409, -.270*
Interaction	.050(.023)	.081	.011, .087*	.009(.041)	.015	-.050, .084	.116(.055)	.068	.016, .120*

Note: Lines indicate a separation of models; * indicates significance

Table 3.5. Direct and Moderation Effects of Attachment and School Connectedness on Suicidality

	All Youth			Male			Female		
Model	*B* (*SE*)	β	95% CI	*B* (*SE*)	β	95% CI	*B* (*SE*)	β	95% CI
Direct Effects (Covaried)									
Secure attachment	-.497(.078)	-.296	-.626, -.368*	-.317(.097)	-.224	-.481, -.162*	-.524(.096)	-.316	-.682, -.364*
School connectedness	-.075(.019)	-.191	-.106, -.043*	-.058(.029)	-.191	-107, -.010*	-.077(.024)	-.186	-.114, -.037*
Attachment avoidance	.266(.060)	.215	.168, .364*	.164(.068)	.162	.052, .274*	.306(.076)	.248	.181, .431*
Attachment anxiety	.240(.067)	.169	.129, .348*	.170(.097)	.147	.014, .328*	.215(.085)	.150	.076, .355*
School connectedness	-.075(.019)	-.190	-.105, -.043*	-.055(.030)	-.184	-.107, -.055*	-.076(.023)	-.186	-.114, -.037*
Moderation Effects									
Secure attachment	-.528(.079)	-.316	-.661, -.401*	-.461(.104)	-.324	-.638, -.295*	-.515(.096)	-.310	-.666, -.350*
School connectedness	-.071(.018)	-.182	-.099, -.038*	-.063(.029)	-.210	-.113, -.016*	-.078(.023)	-.191	-.115, -.038*
Interaction	.017(.016)	.049	-.008, .044	.065(.022)	.235	.026, .097*	-.010(.023)	-.027	-.044, .030
Attachment avoidance	.308(.061)	.250	.209, .411*	.241(.078)	.235	.105, .362*	.330(.076)	.268	.202, .452*
School connectedness	-.082(.018)	-.210	-.111, -.051*	-.064(.030)	-.211	-.116, -.018*	-.083(.023)	-.204	-.118, -.044*
Interaction	-.010(.012)	-.039	-.030, .010	-.036(.017)	-.180	-.063, -.007*	.006(.018)	.023	-.023, .034
Attachment anxiety	.302(.069)	.213	.188, .415	.198(.101)	.169	.030, .317*	.297(.086)	.207	.152, .438*
School connectedness	-.096(.019)	-.248	-.128, -.065	-.083(.035)	-.273	-.438, -.091*	-.102(.024)	-.251	-.140, -.061*
Interaction	.006(.015)	.019	-.019, .030	-.024(.030)	-.102	-.288, .137	.020(.019)	.063	-.012, .050

Note: Lines indicate a separation of models; * indicates significance

Table 3.6. Simple Slope Analysis of Moderator School Connectedness for Attachment and Depression, and Suicidality

Depression									
	All Youth			Male			Female		
Predictor	M Level	B	95% CI	M Level	B	95% CI	M Level	B	95% CI
Secure attachment	-	-	-	-	-	-	-1SD	-.694	-1.077, -.316*
	-	-	-	-	-	-	Mean	-1.023	-1.297, -.734*
	-	-	-	-	-	-	+1SD	-1.352	-1.739, -.893*
Attachment anxiety	-1SD	.484	.252, .702*	-	-	-	-1SD	.320	.046, .591*
	Mean	.713	.521, .904*	-	-	-	Mean	.635	.391, .866*
	+1SD	.942	.647, 1.223*	-	-	-	+1SD	.951	.557, 1.325*
Suicidality									
	All Youth			Male			Female		
Predictor	M Level	B	95% CI	M Level	B	95% CI	M Level	B	95% CI
Secure attachment	-	-	-	-1SD	-.723	-.982, -.440*	-	-	-
	-	-	-	Mean	-.430	-.600, -.269*	-	-	-
	-	-	-	+1SD	-.138	-.316, .044	-	-	-
Attachment avoidance	-	-	-	-1SD	.384	.150, .587*	-	-	-
	-	-	-	Mean	.223	.099, .339*	-	-	-
	-	-	-	+1SD	.063	-.048, .179	-	-	-

Note: Only simple slopes of significant interaction effects are presented above; non-significant interaction effects are denoted with a (-); M Level = levels of school connectedness moderator (1 standard deviation below the mean, the mean, 1 standard deviation above the mean); * indicates significance.

Chapter 4.

Discussion

The purpose of this study was to examine the extent to which school connectedness moderates the relationship between attachment and adolescent substance use, depression, and suicidality, separately. While past studies have predominately studied these relationships in normative community samples of adolescents, the present study extends the literature by examining these relationships in a large sample of high-risk clinical adolescents. Further, associations between attachment, school connectedness, and mental health outcomes were also explored across subsamples of male and female adolescents.

4.1. Covaried Direct Effect Relationships

Overall, when variables were covaried to examine unique associations between the predictors and mental health outcomes, the findings were consistent with prior research (e.g., Diamond et al., 2019; Dibek & Kurt, 2019; Fairbairn et al., 2018; Hayre et al., 2019; Marraccini & Brier, 2017; Mikulincer & Shaver, 2019; Moore et al., 2018; Joyce, 2019; Khan et al., 2020; Weatherson et al., 2018; Zheng et al., 2020; Zortea et al., 2019). Specifically, attachment security, attachment insecurity, and school connectedness predicted higher substance use, depression, and suicidality, among teens. These findings were consistent in models tested on the full sample of adolescents and when models were independently tested for participating male and female youth.

Regarding the attachment insecurity dimensions investigated, only attachment avoidance was significantly positively associated with substance use in the full sample and the male and female subsamples. These findings are consistent with prior research (e.g., Fairbairn et al., 2018; Hayre et al., 2019) linking attachment avoidance, rather than attachment anxiety, to substance use, while also finding no gender differences. Researchers have argued that adolescents with attachment anxiety may be more self-critical and, as a result, may be less likely to participate in or continue risk-taking externalizing behaviours such as substance use, as that may hinder or prevent them

from acquiring a connection with others, such as their caregivers (Cantazaro & Wei, 2010; De Santis et al., 2019). Further, despite bivariate correlations suggesting a significant relationship between school connectedness and substance use for the full sample, there was no relationship between these variables for the male and female samples. This may be due to unique associations present when controlling for subsequent predictors in the model, such as attachment. Researchers have suggested that attachment and school connectedness work in tandem to reduce maladaptive mental health outcomes (e.g., Oldfield et al., 2016). Attachment security may provide an ideal foundation for school connectedness, and as such, these two aspects of development go hand in hand. Specifically, findings have supported the notion that parent attachment influences how adolescents perceive their school environment, which in turn directly affects their level of school connectedness (Shochet et al., 2013). However, there may be times where either attachment or school connectedness has a more substantial influence, depending on the mental health outcome assessed.

4.2. Moderation Effects of School Connectedness

School connectedness did not moderate the association between attachment and substance use in this sample of high-risk adolescents. This may suggest that the parent-adolescent attachment relationship is more relevant than school connectedness in developing and maintaining substance use in clinical samples. This finding is consistent with similar studies (e.g., Yapp, 2019), which found that school connectedness did not moderate the association between parent-child relationship quality and substance use. Unfortunately, to my knowledge, there have not been any studies explicitly looking at school connectedness as a moderator between attachment dimensions and substance use among adolescents. Therefore, further examination of the moderating effects of school connectedness on attachment and substance use is needed to be conducted.

School connectedness also did not moderate the relationship between attachment and depression among male youth. However, it is important to note that the main effects were significant, suggesting that attachment and school connectedness may not work synergistically based on the current findings. However, they play an essential role individually in reducing depressive symptomology among males. In contrast, moderation effects were found among female participants. Specifically, as levels of school connectedness increased, the inverse association between secure

attachment and symptoms of female depression also increased in magnitude. This indicates that the presence of both secure attachment and a high degree of school connectedness work in conjunction against the experience of high depressive symptomatology among female youth.

Similarly, at lower levels of attachment anxiety, school connectedness weakened the impact of attachment anxiety on symptoms of female depression. Collectively, these findings are novel and contradictory to previous studies (e.g., Oldfield et al., 2018; Shochet et al., 2008), who found school connectedness did not moderate the relationship between attachment and depression (Shochet et al., 2008) or mental health outcomes in general (Oldfield et al., 2018). This suggested that the parent-adolescent attachment relationship may be more important in influencing depressive symptoms as there was no evidence that school connectedness influenced this relationship. Despite this, it is crucial to consider that school connectedness may reinforce learning from caregivers, amplifying the collective effect on reducing depressive symptomology. The current study demonstrated that as much as attachment is vital in development, school connectedness can help consolidate information gained in a secure attachment environment while protecting against the impact of low attachment anxiety. Furthermore, the differences found among my results and those published elsewhere can, at least in part, be explained by the characteristics of the samples utilized in the respective studies. Previous studies (e.g., Oldfield et al., 2018; Shochet et al., 2008) were comprised of normative samples of adolescents, whereas the current study utilized a high-risk clinical adolescent sample. In a clinical sample, the association examined might differ from those in a normative sample, given the likely higher degree of severity among the outcomes studied within a clinical sample. Regardless, this may be an important avenue of research to consider where researchers could examine normative versus clinical samples of adolescents across the study variables to determine if significant differences in symptom severity of depression exist.

School connectedness did not moderate the relationship between attachment and suicidality among females; however, the main effects were significant, suggesting that attachment and school connectedness may not work in conjunction, but they play an important role individually in reducing suicidality among females. Conversely, moderation effects were found among male participants. Specifically, at low levels of attachment security and at high levels of attachment avoidance, school connectedness weakened

the impact of attachment insecurity on suicidality symptoms, respectively. This suggests that school connectedness compensated for the effects of low attachment security and attachment avoidance on suicidality symptoms. These findings are novel given the lack of studies explicitly examining school connectedness as a moderator for these study variables. Consequently, a recent study examined the moderating effects of school connectedness on the relationship between cyberbullying and cyber-victimization and suicidality (see Kim et al., 2020). This study found that school connectedness served as a significant buffer, reducing the impact of cyber victimization on suicidality. These studies collectively reinforce that school connectedness is a vital protective factor against suicidality among at-risk adolescents, especially males.

4.3. Implications

At-risk teenagers are faced with daunting challenges throughout adolescence. This, in turn, can give rise to complex mental health concerns. Therefore, it is relevant to consider when and how mental health difficulties in teens can be ameliorated and prevented. This research suggests that two possible intervention avenues to combat these challenges include evidence-based interventions at both the parent-child attachment level and the school connectedness level. The current study provided additional support for the idea that attachment security is vital in reducing mental health concerns. Therefore, intervening at the parent-adolescent attachment level would help increase attachment security to mitigate these concerns. There is empirical evidence on the impact that an attachment-based intervention can have in reducing emotional and behavioural difficulties in adolescents (Moretti et al., 2018). As a result, parents must consider these interventions if they feel their relationship with their teenager is straining, and they are having a difficult time adjusting to adolescence.

The current study also provided support for the protective impact of school connectedness on adolescent mental health concerns. Intervening at the school connectedness level would greatly help in reducing these concerns. However, the literature on the effectiveness of school connectedness-based interventions is mixed. There have been several interventions suggested for school connectedness (Chapman et al., 2013). A review of school connectedness-based interventions conducted by Chapman and company (2013) examined seven school connectedness-based interventions designed to reduce risk-taking behaviour (such as substance use) in

adolescents. They found that 4 out of 7 interventions showed increases in school connectedness and reduced risk-taking behaviours. Despite these findings, there was no conclusive evidence that school connectedness was the mechanism of change that reduced risk-taking behaviours. Therefore, future research may consider utilizing a dismantling study to determine if school connectedness is the driving force in pre-established interventions to reduce risk-taking and other mental health outcomes. Further, unlike attachment-based interventions, which are strongly rooted in theory, there was no central theory presented on how to improve school connectedness due to a lack of consensus on the conceptualization of school connectedness. Therefore, future studies need to emphasize creating theory-driven interventions that will enhance school connectedness, given the abundance of research available on this topic. Despite the number of studies on this topic, there seems to be limited research examining school connectedness-based interventions for mental health outcomes. This is corroborated by the meta-analysis conducted by Marraccini and Brier (2017) investigating school connectedness and suicidality, suggesting a lack of intervention-based research despite the abundance of research on this topic. Therefore, an important consideration for researchers would be to have a consensus for what a school connectedness-based intervention is and then determine how school connectedness can be utilized as the central mechanism of change for reducing mental health outcomes in adolescents.

4.4. Limitations and Future Directions

Several limitations are noteworthy in tempering the interpretation of these findings. First, there was a heavy reliance on youth self-report information. There is ample empirical support for the use of self-reports for youth as they are in an advantageous position to report on many domains of their behaviour, including substance use, depression, and suicidality (see Hayre et al., 2019; Long et al., 2020; Pegg et al., 2020). While adolescents are in a unique position to reflect on and report their level of mental health symptoms, the quality of their relationships with parents, and their sense of school connectedness, future studies should consider supplementary observational measures and interview-based assessments. Second, the measures utilized for suicidality and substance use are broad; future research may utilize more specialized measures to include the current constructs' nuances. For instance, a comprehensive substance use measure including prescription drug abuse, such as the

Brief Screener for Tobacco, Alcohol, and Drug (BSTAD; Kelly et al., 2014) could be utilized; and a comprehensive suicide measure, such as the Suicidal Ideation Questionnaire (SIQ; Reynolds, 1987) could be used. Third, additional research is required to better understand the long-term and transactional role of school connectedness as a moderator of the relationship between secure and insecure attachment (avoidance and anxiety) and substance use, depression, and suicidality, and future research should also examine objective observational multi-informant measures of school connectedness. Fourth, some findings for females and males appeared to differ, however as these were not explicitly tested, results should be interpreted with caution, and further research should include gender as a moderator to test invariance for sex. Finally, as mentioned, future studies need to emphasize creating a central theory-driven school connectedness-based intervention given the amount of research available on this topic.

4.5. Conclusion

These limitations notwithstanding, the current findings underscore the importance of a secure parent-adolescent attachment and school connectedness for adolescent development moving forward. In particular, this information suggested that attachment is foundational for utilizing the protective effects of school connectedness to reduce adolescent externalizing and internalizing behaviours, specifically female depression and male suicidality. Therefore, recently developed attachment-based interventions for parents of at-risk adolescents hold promise in reducing risk for substance use, depression, and suicidality among adolescents (Moretti et al., 2018).

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Appendix.

Frequency of Adolescent Substance Use in the Past 30 Days

	Cigarette Use		Alcohol Use		Marijuana Use		Other Drug Use	
Days	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent
0	350	72.9	337	70.2	335	69.8	425	88.5
1-2	22	4.6	53	11.0	32	6.7	16	3.3
3-5	15	3.1	36	7.5	16	3.3	7	1.5
6-9	8	1.7	23	4.8	16	3.3	4	0.8
10-19	16	3.3	5	1.0	14	2.9	1	0.2
20-29	12	2.5	3	0.6	18	3.8	0	0
All 30	36	7.5	1	0.2	27	5.6	3	0.3
Missing	21	4.4	22	4.6	22	4.6	24	5.0
Total	480	100	480	100	480	100	480	100
Mean	.91		.51		.92		.14	
Std. Dev.	1.89		1.02		1.81		.65	