Proximal and Distal Relations Between Interpersonal Conflict, Social Connectedness, and Youth

Suicide Risk

by

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DEDICATION

To my parents, Fernando and Carmen Arango, whose sacrifice, love, and unwavering support allowed me to accomplish goals greater than I could have ever imagined. To my brother, Juan Fernando Arango, you have been the most wonderful gift.

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ABSTRACT

As the second leading cause of death among youth between the ages of 10 and 24 in the United States, suicide is a pressing public health concern. In addition to clinical risk factors such as a history of suicide attempts and psychopathology, several social factors relate to suicide risk, such as high interpersonal conflict (e.g., bully victimization, interpersonal aggression) and low social connectedness. While low social connectedness is associated with an increased likelihood of suicidal ideation and behavior, high connectedness has been shown to have a role in attenuating the effects of bullying victimization on suicide risk. However, less is known regarding the relationships between victimization, connectedness, and suicide risk prospectively or regarding how domains of connectedness may be differentially protective. Additionally, though interpersonal conflict and low social connectedness are empirically supported suicide risk factors, little is known about the role of these factors in the hours just prior to a suicide attempt. Such factors are potentially modifiable and could be important targets for suicide risk prevention efforts. Accordingly, this dissertation is comprised of two studies that examine the proximal and distal relationship between interpersonal conflict, social connectedness, and suicide risk in samples of high-risk youth. The first study prospectively examines the interaction between bullying victimization, social connectedness, and suicide risk in a sample of victimized youth. This study has two primary aims: 1) to examine the prospective relation between bullying victimization severity and suicide risk, and 2) to examine the protective role of connectedness in specific relational domains (family, school, community) in moderating the prospective relation between bullying victimization severity and suicide risk. Participants are youth (N = 142), ages 12-15, recruited from a general emergency department and assessed at three time points across sixteen months. All youth screened positive for bullying victimization. Family, school, and community connectedness were prospectively associated with decreased suicide risk (higher self-esteem, lower depression, decreased suicidal ideation). Moreover, school connectedness was found to protect youth against the negative impact of victimization on self-esteem and suicidal

ideation. Similarly, school connectedness buffered the negative impact of electronic victimization on suicidal ideation and relational victimization on self-esteem. The second study utilizes a case-crossover design to examine interpersonal conflict, bullying involvement, and social connectedness as proximal suicide risk factors in a sample of youth with a recent suicide attempt. This study has the primary aim of examining whether (per parent and adolescent reports) interpersonal conflict, bullying involvement, and social connectedness are warning signs for suicide attempts. Participants are youth (N = 32), ages 12-17, recruited from psychiatric and pediatric emergency departments who reported a suicide attempt within the previous two weeks. Results indicate that interpersonal conflict and social withdrawal, per adolescent report, are related to increased likelihood of making a suicide attempt. Additionally, interpersonal conflict, bullying involvement, and social withdrawal, per parent report, are related to increased likelihood of making a suicide attempt. Taken together, findings have the potential to inform prevention and intervention approaches focused on targeting interpersonal conflict, bullying victimization, and social connectedness to attenuate suicide risk.

CHAPTER I
Introduction

Suicide is a significant public health concern and tragedy impacting countless individuals daily. According to the Centers for Disease Control and Prevention (CDC), suicide is the second leading cause of death among adolescents in the United States (Centers for Disease Control and Prevention, 2016). Estimates indicate that in 2015 alone, over two thousand youth, ages 10-19, died by suicide. Globally, suicide is the third leading cause of death among adolescents (World Health Organization, 2017), preceded only by traffic injuries and respiratory infections. A recent report from the World Health Organization (WHO) estimates that over 1.2 million adolescents die per year of primarily preventable causes. Specifically, over sixty-seven thousand adolescents worldwide, ages 10-19, died by suicide or accidentally from self-harm in 2015. Despite the implementation of various prevention and intervention approaches, the age-adjusted suicide rate increased by 33% from 1999 to 2017 in the United States (Hedegaard, Curtin, & Warner, 2018).

Given the pressing public health concern presented by youth suicide and the need for effective prevention approaches, understanding precursors of suicide (e.g., suicidal ideation, suicide behaviors, suicide attempts) is immensely important. Among a large, nationally representative United States sample of youth (N = 6,483), ages 13-18, interviewed face-to-face, approximately 12.1%, 4.0%, and 4.1% report a lifetime history of suicidal ideation, suicide plans, and suicide attempts, respectively (Nock et al., 2013). However, a systematic review of 128 self-report international studies reports the mean percentage of youth with a lifetime history of suicidal ideation (29.9%) and suicide attempts (9.7%) as much higher (Evans, Hawton, Rodham, & Deeks, 2005). Per recent data from the Youth Risk Behavior Surveillance System of high school students in the United States, 17.7% of high schools students had seriously considered making a suicide attempt and 8.6% made at least one attempt in the previous year (Kann et al., 2016). Of note, discrepancies in the prevalence of suicidal ideation and behavior may be related to study methodology as prior research has indicated that adolescents report

suicidal ideation at higher rates on self-report measures as compared to clinical interviews (Kaplan et al., 1994). Moreover, estimates indicate that a substantial percentage of youth who report suicidal ideation make a suicide plan (33.4%) and attempt (33.9%) (Nock et al., 2013).

The transition into adolescence is a critical window marked by biological, cognitive, and psychosocial changes (Meeus, 2016; Sanders, 2013), as well as a stark increase in adolescent suicidal ideation, plans, and attempts (Nock et al., 2013). This change is evident by an eight-fold increase in suicidal ideation from age 11 to age 14 and a four-fold increase in suicide plans and attempts across this age range. Notably, this increase occurs in parallel with the immense changes that take place throughout the adolescent years. Principally, increases in suicidal ideation and behaviors are conceptualized as occurring in conjunction with increases in psychopathology and improvements in cognitive abilities (Steinberg, 2005), which facilitate suicide attempt planning (Bridge, Goldstein, & Brent, 2006). Particularly across adolescence, there is a significant increase in depression (Avenevoli, Swendsen, He, Burstein, & Merikangas, 2015), alcohol use (M. E. Patrick & Schulenberg, 2014), and illicit drug use (Johnston, O'Malley, Bachman, & Schulenberg, 2013).

Adolescent development involves maturation of the prefrontal cortex. This maturation is manifested in improved abilities for abstract reasoning, affective modulation, and response inhibition (Casey, Jones, & Hare, 2008; Casey, Jones, & Somerville, 2011; Yurgelun-Todd, 2007). Adolescence is also a stage with significant increases in impulsivity, risk-taking behaviors, and sensation seeking (Collado, Felton, MacPherson, & Lejuez, 2014; Crone, Duijvenvoorde, & Peper, 2016; Romer, 2010). These changes result in a paradox of increased reasoning abilities (e.g., resulting from prefrontal cortex development) and generally poorer decision- making (e.g., related to increases in impulsivity and sensation seeking).

There also are substantial changes in social relationships throughout the adolescent years. For instance, the influence of and reliance on peers significantly increases (Arnett, 2014; Buhrmester, 1998; DiClemente, Santelli, & Crosby, 2009; Smetana, Campione-Barr, & Metzger, 2006). Friendships change as adolescents shift to rely on peers for support and increase their desire to spend more time together (DiClemente et al., 2009). During this time, how youth are perceived by peers increases in salience for them, and individuals become more aware of constructs such as public image and reputation. Across adolescence, interpersonal relationships

with peers increase in importance and prospectively hold a greater influence (Brown & Larson, 2009; Van Harmelen et al., 2017). During this stage, there is also an increase in interpersonal challenges (Brown & Larson, 2009; Buhrmester, 1998; Furman & Buhrmester, 1992) and interpersonal factors have a robust and well-documented relationship with increases in youth suicide risk (King & Merchant, 2008). Collectively these developmental changes are associated with the stark increase in adolescent suicidal ideation, plans, and attempts. As such, it is essential to understand suicide risk in the context of the immense changes that occur throughout this period.

Relevant Definitions

It is important to define relevant terms used to describe suicide and related constructs throughout the literature. Inconsistencies with definitions have severe implications including the generalizability of study findings and inaccuracies in prevalence estimates (M. M. Silverman, Berman, Sanddal, O'carroll, & Joiner, 2007). The definitions below are based on recommendations from the Centers for Disease Control and Prevention (Crosby, Ortega, & Melanson, 2011). *Self-directed violence*, a term analogous to *self-injurious behavior*, is an umbrella term used to describe any deliberate self-directed behavior with the potential for injury. Self-directed violence can be suicidal or non-suicidal. *Non-suicidal self-directed violence*, a term analogous to *non-suicidal self-injury (NSSI),* encompasses any deliberate self-directed behavior without evidence of suicidal intent. *Suicidal self-directed violence* encompasses any deliberate self-directed behavior with any intent to die. This category includes suicide behaviors and suicide attempts. *Suicide* refers to death as a direct result of a self-injurious behavior with any intent to die as a result. A *suicide attempt* is a non-fatal deliberate self-directed behavior performed with any intent to die, which may or may not result in injury. *Suicide behaviors* include any preparatory actions towards making a suicide attempt (e.g., buying a gun, collecting pills, writing a suicide note, aborted suicide attempt, interrupted suicide attempt), as well as suicide attempts. *Suicidal ideations*, a term analogous to *suicidal thoughts*, include any thoughts or considerations about suicide such as thoughts about death and dying or more serious thoughts about making a suicide attempt. Finally, *suicide risk* includes empirically supported factors that increase the likelihood of suicidal ideation, suicide behaviors, suicide attempts, and death by suicide (Hendin, Maltsberger, Lipschitz, Haas, & Kyle, 2001). Clinically, these are factors with

some utility for understanding which youth are at increased risk of engaging in self-directed violence and frequently inform clinical conceptualizations and intervention planning. Moreover, suicide risk factors serve as key prevention and intervention targets. Suicide risk factors are also evaluated empirically as they allow researchers to learn about what places youth at increased risk for suicide, a relatively infrequent occurrence.

Suicide Risk Factors

Given the increasing suicide rate, the number of youth suffering from thoughts of suicide, and the alarming prevalence of self-harm behaviors, it is crucial to understand factors that increase risk of suicide. Such an understanding can guide efforts aimed at reducing the public health burden of this tragedy. Our understanding of what places an individual at elevated risk for suicide has increased over the past few decades. A large number of risk factors have been identified, and there is converging evidence from multiple studies. Risk factors span interpersonal and intrapersonal domains and include demographic characteristics (e.g., age, sex, sexual/gender minority status, and cultural background) (King, Foster, & Rogalski, 2013; Nock et al., 2008). Specifically, prior suicide attempts and behaviors, non-suicidal self-injury (NSSI), suicidal ideation, psychopathology (especially mood, substance use, and conduct disorders), interpersonal conflict, and low social connectedness relate positively to suicide risk in both cross-sectional and longitudinal studies (Gould, Greenberg, Velting, & Shaffer, 2003; Kessler, Borges, & Walters, 1999; McLoughlin, Gould, & Malone, 2015; Nock et al., 2008).

Demographic Characteristics as Suicide Risk Factors

Reports consistently indicate that females are significantly more likely than males to report suicidal ideation and suicide behaviors (Evans et al., 2005; Kann et al., 2016). However, adolescent males are approximately four times more likely to die of suicide, and their deaths account for over 80% of all deaths by suicide in this age group (Centers for Disease Control and Prevention, 2016). There are also racial and ethnic differences in the prevalence and course of youth suicide. Most notably, non-Hispanic American Indian or Alaskan Native individuals have the most alarming age-adjusted suicide rate, and from 1999 to 2014 this group experienced the largest percentage suicide rate increase (Curtin, Warner, & Hedegaard, 2016).

In addition to demographic characteristics such as sex and racial minority status, sexual and gender minority status are risk factors among adolescents (Russell, 2003). Sexual minority

youth report substantially higher rates of depression, suicidal thoughts, behaviors, and attempts (Marshal et al., 2011). Risk disparities between sexual minority and heterosexual youth increase with severity of risk (e.g., disparities between groups are greater for suicide attempts (OR = 3.18) than for suicidal ideation (OR = 1.96). Moreover, there is evidence that these disparities persist through the transition into young adulthood and are greater for females and individuals identifying as bisexual (Marshal et al., 2013). Though replication studies are needed, initial studies have also found these disparities among gender minority youth (Grossman & D'Augelli, 2007).

Intrapersonal Suicide Risk Factors

Suicide Attempts. A suicide attempt history is the strongest single predictor of a subsequent suicide attempt (Lewinsohn, Rohde, & Seeley, 1996; Nrugham, Larsson, & Sund, 2008) and suicide among youth (Bridge et al., 2006). A systematic review of psychological autopsy studies among adults indicated that approximately 40% of individuals who died by suicide had a suicide attempt history (Cavanagh, Carson, Sharpe, & Lawrie, 2003). These findings are comparable to the findings from a study that utilized a psychological autopsy approach to examine differences between adolescents who died by suicide and community case-matched controls (Brent, Baugher, Bridge, Chen, & Chiappetta, 1999; Shaffer et al., 1996). Shaffer and colleagues (1996) reported that approximately 33% of adolescents who died by suicide (n = 112) had a prior suicide attempt, compared to only one adolescent in the control condition (n = 147). Comparably, Brent and colleagues (1999) reported that 36.9% of adolescents who died by suicide had a suicide attempt history, compared to 1.1% of adolescents in the control condition. Estimates indicate that a prior suicide attempt increases the risk of death by suicide by 10 to 60 times (Bridge et al., 2006).

Youth who have engaged in multiple suicide attempts are at the highest risk. Among a sample of psychiatrically hospitalized adolescents, the number of previous attempts was the strongest indicator of subsequent attempts. Youth with a history of multiple attempts had a two-fold increase in risk for subsequent attempts when compared to those with a single attempt history or youth presenting with suicidal ideation (Goldston et al., 1999). High school students with multiple suicide attempts at an index assessment were four times more likely to make a subsequent suicide attempt (at a 4-6 year follow-up) when compared to students with a single

prior attempt or those with suicidal ideation (Miranda et al., 2008). Evidence suggests that any self-directed violence, irrespective of intent, elevates suicide risk. In a review of 177 international research studies examining suicide risk factors, authors concluded that approximately one in every 25 patients presenting to a hospital setting for self-injurious behavior, irrespective of intent, will die of suicide within the subsequent five years (Carroll, Metcalfe, & Gunnell, 2014). Moreover, in a population-based cohort study, youth who harmed themselves had a nine times increased likelihood of dying of unnatural causes during the follow-up period (Morgan et al., 2017).

   Non-suicidal Self-injury (NSSI). NSSI is a distinct construct that differs from suicide behaviors and attempts in intent, prevalence, lethality, and frequency (Glenn et al., 2017). However, there is substantial overlap between suicidal and NSSI behaviors, and engagement in NSSI is a consistent predictor of concurrent and subsequent suicide behaviors and attempts (Asarnow et al., 2011; Scott, Pilkonis, Hipwell, Keenan, & Stepp, 2015). This link is especially alarming given the high prevalence of NSSI. Based on a systematic review of international studies, it is estimated that the prevalence of NSSI among adolescents is approximately 18% (Muehlenkamp, Claes, Havertape, & Plener, 2012). Among adolescent psychiatric inpatients with a history of NSSI, approximately 70% also reported a suicide attempt history, with 55% reporting more than a single attempt (Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006). Among samples of high school students and adolescent psychiatric patients, NSSI and suicidal ideation were significantly associated with a suicide attempt history, even while controlling for other clinical and demographic characteristics (Klonsky, May, & Glenn, 2013). Approximately 35% of outpatient and inpatient adolescents report both a lifetime history of NSSI and suicide attempts (Glenn et al., 2017). Notably, in this sample, the majority of outpatient (90.5%) and inpatient (89.7%) adolescents with a suicide attempt history also reported lifetime NSSI engagement. There is also support for the prospective relationship between NSSI and suicide attempts. Among a large adolescent community sample (N = 399) assessed at four time points across 2.5 years, baseline engagement in NSSI was prospectively associated with suicidal ideation severity and subsequent suicide attempts (Guan, Fox, & Prinstein, 2012).

   Suicidal Ideation. Thoughts of suicide are frequently used when gauging suicide risk among youth as there is substantial support for the prospective relationship between suicidal

ideation and suicide attempts (Lewinsohn, Rohde, & Seeley, 1994). A recent study assessed the predictive validity of the Columbia-Suicide Severity Rating Scale (C-SSRS), a commonly used assessment tool, among a sample of 178 adolescents seeking psychiatric emergency services. In this sample, the C-SSRS intensity scale (measuring frequency, duration, controllability, deterrents, and reasons for suicidal ideation) and a lifetime history of NSSI engagement were predictive of subsequent psychiatric emergency visits and suicide attempts at that visit (Gipson, Agarwala, Opperman, Horwitz, & King, 2015). Among youth who reported suicidal ideation at baseline, the duration of ideation was also significantly predictive of subsequent psychiatric emergency visits and suicide attempts at that visit. Comparably, among a sample of adolescents with a suicide attempt history, severity of worst lifetime suicidal ideation on the C-SSRS was prospectively associated with subsequent suicide attempts (Posner et al., 2011). However, findings from a study examining self-reported suicidal ideation in a sample of psychiatrically hospitalized youth suggest that the relationship between suicidal ideation and subsequent suicide attempts is moderated by gender (King, Jiang, Czyz, & Kerr, 2014). Findings are comparable to those of a previous study, which found support for a prospective association between increased suicidal ideation and suicide attempts for girls only in a large community sample of youth and young adults (Lewinsohn, Rohde, Seeley, & Baldwin, 2001). Taken together, findings have significant implications regarding the importance of considering suicidal ideation in risk formulation. However, considering suicidal ideation alone may not be sufficient, especially for boys.

Psychopathology and Substance Use. Psychopathology is a well-established factor associated with suicide beahviors and suicides among adolescents (Evans, Hawton, & Rodham, 2004; Gould et al., 2003; McLoughlin et al., 2015). In a review of thirteen studies examining deaths by suicide and psychopathology among young people (894 cases), authors found that approximately 88% met criteria for one mental disorder. Mood (42.1%), substance-related (40.8%), and disruptive behavior disorders (20.8%) were the most common (Fleischmann, Bertolote, Belfer, & Beautrais, 2005). In a systematic review of psychopathology among young patients presenting for hospital care following an incident of self-harm, 81.2% of patients had a psychiatric disorder with mood disorders (mainly depression) being the most frequent (56.3%). This was followed by substance misuse (24.8), adjustment (24.7%), attention deficit

hyperactivity (24%), anxiety (16.6%), and conduct (9.7%) disorders (Hawton, Saunders, Topiwala, & Haw, 2013). However, more recent estimates, including a 2018 report published by the CDC, estimate that approximately 54% of those who died by suicide in 2015 across 27 states did not have a known mental health disorder (Stone et al., 2018).

In a systematic review of 26 population-based studies, authors found strong evidence for an association between depression, suicidal thoughts, behaviors, and attempts (Evans et al., 2004). Among a large adolescent sample (N = 6,483), 56.8% of adolescents with suicidal ideation, 69.7% of those with a plan, and 75.7% of those with a suicide attempt history met criteria for major depressive disorder or dysthymia (Nock et al., 2013). These rates were all significantly different when compared to youth with no history of suicide behaviors or attempts. Hopelessness, an expectation of negative future outcomes, is a frequent experience for depressed adolescents and is also a risk factor for suicidal thoughts and attempts. Among a sample of adolescents with a suicide attempt history, hopelessness was among the predictors in a multivariable model (including comorbid disorders, receipt of mental health treatment, suicide attempt history) associated with subsequent suicide attempts at a 9-year follow-up (Groholt, Ekeberg, & Haldorsen, 2006). Moreover, changes in hopelessness and depression have been linked to changes in suicidal ideation across a year (Mazza & Reynolds, 1998). Low self-esteem, a frequent experience for youth experiencing depression symptoms, is also linked to increased suicide risk among inpatient and community adolescent samples (Fergusson, Beautrais, & Horwood, 2002; Groholt et al., 2006).

The relationship between substance use and suicidal ideation, behaviors, and attempts is well documented. Estimates indicate that generally, alcohol and illicit drug use increase the risk for suicidal behaviors and attempts among clinical and community adolescent samples. (Esposito-Smythers & Spirito, 2004). Additionally, the use of multiple substances appears to increase this risk. Kokkevi and colleagues (2012) found that the likelihood of reporting a suicide attempt doubled with each additional substance used. Alcohol use has the potential to differentiate between youth experiencing suicidal thoughts and youth who have made a suicide attempt (McManama O'Brien, Becker, Spirito, Simon, & Prinstein, 2014). Furthermore, alcohol use frequency is positively associated with the risk of making a suicide attempt among youth with low levels of depression. In a sample of adolescents, ages 12-17, injection substance use

was associated with an increased risk of making a suicide attempt but not with suicidal ideation or plans (Liu, Case, & Spirito, 2014). These results are important given the difficulties in distinguishing adolescents with only suicidal ideation from those who engage in suicidal behaviors or suicide attempts (Klonsky & May, 2014). These findings provide support for the significance of intervening with youth who are using alcohol and illicit drugs.

Conduct and disruptive disorders also increase the risk of suicide attempts and deaths by suicide (Renaud, Brent, Birmaher, Chiappetta, & Bridge, 1999; Shaffer et al., 1996). Moreover, the presence of a conduct disorder is an important risk factor for suicide among youth not experiencing mood disorders (Brent et al., 1993). Hallmarks of conduct and disruptive disorders include interpersonal conflict/aggression (discussed more thoroughly in the "Aggression" section below) and impulsivity, which are also independently related to suicidal thoughts and behaviors. For instance, some research supports the link between impulsivity and increased suicide risk (Gvion & Apter, 2011; Horesh, Gothelf, Ofek, Weizman, & Apter, 1999). Notably, recent conceptualizations have challenged such findings and suggest that the link between impulsivity and suicidal behaviors is better accounted for by painful and provocative experiences (proposed to increase capability for engagement in suicidal behavior), which are more common among impulsive individuals (Anestis, Soberay, Gutierrez, Hernández, & Joiner, 2014; Witte et al., 2008).

Interpersonal Youth Suicide Risk Factors

Interpersonal risk factors are important predictors of suicidal ideation and suicide attempts. Interpersonal factors of particular importance include interpersonal violence, aggression, bullying victimization, bullying perpetration, and social connectedness.

Interpersonal Violence. A meta-analysis of longitudinal studies (N = 29) found support for the prospective link between exposure to interpersonal violence (childhood maltreatment, bullying victimization, dating violence, and community violence) and suicide attempts (Castellví et al., 2017). In this meta-analysis, childhood sexual abuse and bullying victimization were the forms of violence conferring the most risk for suicide attempts. Additionally, substantial research, as outlined in a recent review, has provided support for the link between childhood maltreatment and adolescent suicide risk (Miller, Esposito-Smythers, Weismoore, & Renshaw, 2013). Recent studies have helped us better understand this relationship. Perez and colleagues

(2016) found that the relationship between adverse childhood experiences and suicide attempts was mediated by impulsivity and aggression among a sample of youth in the juvenile justice system. Additionally, exposure to dating violence is associated with an increased likelihood of suicidal thoughts, plans, and attempts (J. G. Silverman, Raj, Mucci, & Hathaway, 2001; Stack, 2014; Vagi, Olsen, Basile, & Vivolo-Kantor, 2015).

Aggression. A recent review and meta-analysis found support for a moderate relationship between aggression and suicidal thoughts and behaviors among both clinical and non-clinical samples of children and adolescents (Hartley, Pettit, & Castellanos, 2016). However, findings on the role of aggression are mixed. For instance, in a study of acutely suicidal adolescents, parent-reported aggression was negatively associated with suicidal ideation (Kerr et al., 2007). Research also suggests that violence engagement is associated with suicidal ideation and attempts (Gunn, Lester, & McSwain, 2011; Stack, 2014). Stack (2014) found that, among a large sample of youth (N = 2,536), physical fighting and violence preparedness (i.e., carrying a weapon) differentiated youth with a suicide attempt history from youth with suicidal ideation.

Bullying perpetration is a type of interpersonal aggression associated with suicidal ideation and attempts. Bullying perpetration includes intentional and chronic harmful aggressive behaviors inflicted onto a peer in the presence of a power imbalance (Gladden, Vivolo-Kantor, Hamburger, & Lumpkin, 2014). This type of aggression is relatively common, and reports indicate that over a third of youth engage in bullying perpetration (Modecki, Minchin, Harbaugh, Guerra, & Runions, 2014). Broadly, involvement in bullying, as a perpetrator, is consistently associated with depression, aggression, delinquency, teen dating violence, and adult antisocial behavior (Barker, Arseneault, Brendgen, Fontaine, & Maughan, 2008; Copeland, Wolke, Angold, & Costello, 2013; Foshee et al., 2014; Kaltiala-Heino, Fröjd, & Marttunen, 2010; Ttofi, Farrington, Lösel, & Loeber, 2011; Winsper, Lereya, Zanarini, & Wolke, 2012). Bullying perpetration has also been linked to increased risk of suicidal ideation, behaviors, and attempts (Kim & Leventhal, 2008). Further, bullying perpetration in middle adolescence increases the risk of subsequent suicidal thoughts and behaviors in late adolescence (Kaltiala-Heino et al., 2010) and adulthood (Meltzer, Vostanis, Ford, Bebbington, & Dennis, 2011). In a study using cluster analysis to examine types of bullying involvement (including both bullying victimization and perpetration), authors found that youth who were in the physically aggressive bully perpetration

group had higher rates of suicidal ideation, suicide behaviors, and suicide attempts than youth who were in the verbal perpetration group (Espelage & Holt, 2013).

Bullying Victimization. In a systematic review of 37 studies assessing the relationship between bullying victimization and adolescent suicide risk, authors concluded that bullying victimization increases the risk of suicidal ideation, behaviors, and attempts (Kim & Leventhal, 2008). This relationship was particularly strong for individuals who engaged in both bullying victimization and perpetration. There is also evidence for a dose-response-relationship, in that as the frequency of bullying victimization increases, the risk of suicidal ideation increases (Arango, Opperman, Gipson, & King, 2016; Klomek, Marrocco, Kleinman, Schonfeld, & Gould, 2007; Van der Wal, De Wit, & Hirasing, 2003). Further, identifying as a victim in middle adolescence increases the risk of subsequent suicidal thoughts and behaviors in late adolescence (Kaltiala-Heino et al., 2010) and adulthood (Meltzer et al., 2011). Recently, the adverse effects of the chronicity of victimization have been documented. In a study of 1,168 youth, chronic victimization (bullying victimization at ages 13 and 15) was associated with an increased risk of suicidal thoughts and attempts while accounting for previous suicide risk factors and psychopathology when compared to victimization at one time point (Geoffroy et al., 2016). Additionally, electronic victimization has been linked to increased suicidal ideation (Kowalski, Giumetti, Schroeder, & Lattanner, 2014). As such, the importance of identifying ways to buffer the adverse effects of bullying victimization is indisputable.

Social Connectedness. Social connectedness is defined as a subjective sense of belongingness, closeness, support, and connection with the social world or specific individuals (Townsend & McWhirter, 2005; Whitlock, Wyman, & Moore, 2014). Low social connectedness has been consistently shown to increase suicide risk among youth (King & Merchant, 2008). Low connectedness to family, peers, and school are all well-established risk factors for youth suicidal ideation and behavior, and connectedness is integral to several theories of suicide (Durkheim, 1897; Joiner, 2009).

Enhanced connectedness is protective against suicide risk (Czyz, Liu, & King, 2012; Kaminski et al., 2010; Opperman, Czyz, Gipson, & King, 2015). Among a large sample of high school students (N = 70,022), parent connectedness was protective against suicide risk (Taliaferro & Muehlenkamp, 2014). Moreover, parent connectedness differentiated between

groups of adolescents with a suicide attempt history, suicidal ideation, and no history of suicidal ideation or attempts. Parent connectedness also appears to be important among high-risk youth. In a study that examined changes in connectedness, authors found that increases in family connectedness were associated with less severe depression symptoms and suicidal ideation in the year following discharge from a psychiatric hospitalization (Czyz et al., 2012). Using a large, nationally representative sample of youth, grades 7 to 12, authors found that changes in parental connectedness and social integration were prospectively protective of suicidal ideation, while increases in school connectedness decrease subsequent likelihood of a suicide attempt (Gunn, Goldstein, & Gager, 2018). Connectedness to school is also predictive of fewer depression symptoms, suicidal ideation, and suicide attempts (Borowsky, Ireland, & Resnick, 2001; Logan, Crosby, & Hamburger, 2011; Resnick et al., 1997; Shochet, Dadds, Ham, & Montague, 2006; Taliaferro & Muehlenkamp, 2014). Though support is less robust, connectedness to non-family adults also has positive effects on suicide risk. Among a sample of Native American youth, community connectedness was negatively related to suicidal thoughts and attempts (Borowsky, Resnick, Ireland, & Blum, 1999). Among severely depressed African American youth, community connectedness was related to endorsement of reasons for not attempting suicide (Matlin, Molock, & Tebes, 2011). Among high school students, connectedness to non-parent adults differentiated between non-suicidal and suicidal ideation groups, and non-suicidal and suicide attempt groups (Taliaferro & Muehlenkamp, 2014). However, the majority of the studies highlighted above were cross-sectional such that further research is warranted in this area.

It is important to understand that suicide risk is complex and cannot be conceptualized using a single predictor. Better understanding the numerous and varied risk factors for suicidal ideation and attempts is highly beneficial as we continue to face challenges in screening for and intervening with high-risk youth. Given that this dissertation focuses on the interplay between interpersonal conflict (particularly bullying victimization), social connectedness, and youth suicide risk, these factors are reviewed more thoroughly in chapters two and three.

Theoretical Frameworks

Several theoretical frameworks have informed the conceptualization of this dissertation. Specifically, social connectedness is an integral component of multiple theories of suicide (Durkheim, 1897; Joiner, 2009; Klonsky & May, 2015). A fundamental theory of suicide,

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proposed by Durkheim in the 1800s, purported that a lack of social integration or deterioration of links to the collective social system results in suicide. In recent years, the Interpersonal Theory of Suicide (Joiner, 2009) and the Three-Step Theory (Klonsky & May, 2015) have both highlighted the central role of social connectedness in understanding suicide.

The Interpersonal Theory of Suicide (IPT) proposes that thwarted belongingness and perceived burdensomeness interact to predict suicidal ideation (Van Orden et al., 2010). In this theory, thwarted belongingness is a subjective alienation from others and can be conceptualized as low social connectedness. Perceived burdensomeness is conceptualized as a subjective experience of feeling that one is a burden to others. This theory purports that what differentiates those who think about suicide from those who make a suicide attempt is an increased acquired capability for suicide. This capability is increased by engagement in risky behaviors, and painful experiences (e.g., history of suicide attempts, NSSI, maltreatment), which habituate an individual to physical pain. As such, the IPT suggests that in the presence of both a desire for death (thwarted belongingness and perceived burdensomeness) and an acquired capability for self-injury, an individual will engage in a suicide attempt (Van Orden et al., 2010). The study of interpersonal conflict and low social connectedness, in relation to suicide risk, is in alignment with this theory. According to the IPT, individuals with low social connectedness, a group that may include victims of bullying, are at increased risk of suicidal ideation. Additionally, individuals who engage in forms of interpersonal violence that may lead to physical injury (e.g., fighting, physical bullying perpetration, impulsive aggression towards others) and, in turn, an increased capability for suicide are at increased risk of engaging in suicidal behaviors or making a suicide attempt.

The Three-Step Theory (3ST) theory, proposed by Klonsky and May in 2015, is also pertinent to the conceptualization of this dissertation. This theory offers an explanation for both the development of suicidal thoughts and for the transition from suicidal thoughts to suicide attempts. Step one explains the development of suicidal thoughts, step two distinguishes moderate from strong suicidal ideation, and step three describes the progression from suicidal thoughts to attempts. Step one of this theory suggests that pain (physical or psychological) and a sense of hopelessness are integral components of suicidal ideation. Secondly, among individuals experiencing both pain and hopelessness, social connectedness could serve as an important

protective factor, potentially preventing the escalation of suicidal ideation. Notably, this theory suggests that among individuals experiencing pain and hopelessness, social connectedness may distinguish individuals with passive suicidal ideation (e.g., "Sometimes I think I might be better off dead") from those with more severe ideation (e.g., "I would like to kill myself if I had the chance") (Klonsky & May, 2015). Finally, akin to the IPT, a suicide attempt occurs in the presence of both suicidal desire and acquired capability to attempt suicide (including both practical and dispositional factors). This theoretical framework is particularly important in informing the conceptualization of this dissertation in two manners. First, this theory highlights the importance of connectedness as a protective factor with the potency to prevent the escalation of suicidal thoughts among individuals experiencing pain and hopelessness. Secondly, this theory highlights the importance of better understanding the transition from suicidal thoughts to attempts. An improved understanding of which individuals are at risk and when they are at risk for making a suicide attempt is critical and can inform prevention and intervention approaches.

Dissertation Purpose

Overall, the previously discussed studies provide substantial support for the relationship between interpersonal conflict (including bullying victimization), social connectedness, and suicide risk. Moreover, the theoretical perspectives outlined offer possible pathways or mechanisms of influence. However, there are gaps in the literature and addressing these gaps could have important implications for prevention and intervention approaches. Though there is empirical and theoretical support for the relationship between interpersonal conflict, social connectedness, and suicide risk, less is known about how these factors interact. A better understanding of the interplay between these factors is important for a more comprehensive conceptualization of youth suicide risk. Specifically, given the range of empirically supported suicide risk factors (outlined above), it is essential to understand how these factors function together. This understanding can also help us appreciate which youth are at highest risk and inform targeted interventions. Moreover, given sex differences in the prevalence of interpersonal conflict, bullying victimization, bullying perpetration, suicidal ideation, and suicide behaviors, it is important to examine how the interplay between these factors varies by sex. Finally, given substantial challenges in identifying when youth are at greatest risk of making a suicide attempt,

research examining proximal risk factors, including interpersonal conflict and social connectedness is warranted.

The overarching goal of this dissertation is to gain a more nuanced understanding of the proximal and distal relationship between interpersonal conflict, social connectedness, and youth suicide risk. To address this goal, this dissertation is comprised of two studies. The first study examines the prospective relationship between bullying victimization severity (a type of interpersonal conflict), social connectedness, and suicide risk. In alignment with the theories of suicide and empirical support outlined above, this study evaluates whether connectedness to different domains (family, school, community) buffers the impact of bullying victimization severity on suicide risk. A second study examines the role of interpersonal conflict and social connectedness in the 24 hours prior to a suicide attempt. An improved understanding of the interplay and proximal impact of interpersonal challenges and social connectedness on suicide risk can have important implications in the conceptualization of risk and could inform prevention and intervention approaches.

CHAPTER II

The Protective Role of Connectedness Domains on the Relationship Between Bullying Victimization and Suicide Risk among High-Risk Youth (Study 1)

Bullying victimization is a significant public health concern with effects felt by youth, families, schools, and communities. Bullying victimization is a form of interpersonal violence distinguishable from other types of aggression by its intentionality, chronicity, and imbalance of power. The CDC (Gladden et al., 2014) defines bullying victimization as harmful aggressive behaviors perpetrated by a peer or peer group. Behaviors must be unwanted, persistent, and involve an actual or perceived power imbalance. Youth can engage in bullying behaviors as victims (youth who are victimized by others) and/or perpetrators (youth who victimize others). Bullying victimization can occur in several forms including physical, verbal, and relational victimization. Additionally, bullying can occur in a range of contexts including traditional contexts (in person victimization in places such as schools and neighborhoods) and electronic contexts (victimization involving the use of electronic means such as emails, instant messages, and/or posting on social media sites). In a recent report calling for a unified definition of bullying victimization and perpetration published by the CDC (Gladden et al., 2014), authors argue for the critical need to distinguish bullying from other types of aggression as it is defined by distinct features (e.g., chronicity, imbalance of power) that warrant unique interventions. Moreover, some evidence suggests that interventions targeting other types of youth aggression have not been successful in the prevention of bullying behaviors at school (Taub, 2002; Van Schoiack-Edstrom, Frey, & Beland, 2002). Such findings provide support for the importance of accurately defining and capturing bullying as interventions may require tailoring to address its unique aspects.

A meta-analysis of 80 studies has estimated the prevalence of bullying victimization as 36% (Modecki et al., 2014). Estimates generally indicate that bullying victimization and

perpetration occur more frequently among boys (Nansel et al., 2001; Seals & Young, 2003; Smith & Gross, 2006). However, girls are more frequently involved in verbal and relational bullying (victimization and perpetration) while males are more frequently involved in overt bullying (victimization and perpetration) (Nansel et al., 2001; Smith & Gross, 2006).

High prevalence rates are concerning as bullying victimization has been associated with a myriad of adverse outcomes (Arseneault, Bowes, & Shakoor, 2010) including poor physical health, psychosomatic problems, self-esteem, academic difficulties, loneliness, and psychopathology (Gini & Pozzoli, 2009; Hawker & Boulton, 2000; Kowalski & Limber, 2013). Moreover, bullying victimization has been consistently linked to increased risk of suicidal ideation, behaviors, and attempts (Arango et al., 2016; Kaltiala-Heino et al., 2010; Kim & Leventhal, 2008). In a meta-analysis of 34 studies (9 of which reported information on suicide attempts), Van Geel and colleagues (2014) found that bullying victimization was associated with suicidal ideation and attempts with odds ratios of 2.2 and 2.6, respectively.

Similarly, in a meta-analysis of studies examining the effects of electronic victimization, authors found support for a moderate and positive relationship between electronic victimization and increased suicidal ideation (Kowalski et al., 2014). Moreover, evidence supports the unique contribution of electronic victimization in the prediction of suicidal ideation. Among a sample of adolescents (n = 375 youth; mean age 14.4) referred for an urgent psychiatric consultation, youth who were electronically victimized reported more suicidal thoughts when compared to youth who were victimized verbally (Alavi, Roberts, Sutton, Axas, & Repetti, 2015). However, by examining the correlates of victimization and suicide risk, it appears that both traditional and electronic victimization are associated with suicidal ideation in comparable ways, findings that have been supported by various studies (Kowalski & Limber, 2013; Litwiller & Brausch, 2013). Additionally, research indicates that youth infrequently report experiences with electronic victimization in the absence of victimization in more traditional contexts. Among a large sample of elementary school students, less than one percent of youth reported electronic victimization in the absence of victimization in more traditional contexts (Salmivalli, Sainio, & Hodges, 2013). This finding was replicated in a large sample of high school students where less than five percent reported only electronic victimization (Waasdorp & Bradshaw, 2015).

Subtypes of victimization (relational, overt, electronic) may be differently associated with adverse outcomes (Nylund, Bellmore, Nishina, & Graham, 2007; J. Wang, Iannotti, Luk, & Nansel, 2010). In a study that examined latent classes of bullying victimization, authors found that youth who were in the all-types class (verbal, relational, physical, electronic) reported more severe depression, nervousness, and sleep difficulties than youth who were primarily verbally or relationally victimized (J. Wang et al., 2010). In a sample of adolescents, ages 12-15, screened for interpersonal challenges (low social connectedness, high bullying victimization, and/or high bullying perpetration), authors found support for the association between severity of all types (verbal, relational, physical) of bullying victimization and suicidal ideation (Arango et al., 2016). Moreover, authors found support for the association between severity of all types of bully victimization and suicide attempts. The relationship between severity of verbal victimization and suicidal ideation and/or suicide attempts (compared to no suicidal ideation) was stronger for males. In a recent study, which examined the relationship between interpersonal stressors and suicide attempts within a high-risk sample of females, only relational victimization, and not other interpersonal stressors, was prospectively associated with an increased likelihood of a suicide attempt (Massing-Schaffer et al., 2018). In all, these findings indicate that nuanced aspects of bullying victimization (i.e., specific type, chronicity, severity) are all indicators of bullying victimization's effect on adverse outcomes, including suicide risk.

Given the high prevalence of bullying victimization and converging evidence for the positive relationship between bullying victimization and suicide risk, (Modecki et al., 2014), bullying victimization may serve as a target for the early intervention and prevention of youth suicide. Though the research examining the relationship between adolescent suicide risk and bullying victimization is rich, there is a relative absence of research focusing on the underlying mechanisms driving these associations. A recent review highlighted this gap, discussed potential mediators, and hypothesized possible factors that may be shaping this relationship (Hong, Kral, & Sterzing, 2014). This review sheds light on the importance of extending beyond the examination of correlates to examine prospective predictive models of the pathways between bullying victimization and youth suicidal ideation, behaviors, and attempts.

It is important to consider that trajectories associated with a lifetime of problems are often set during adolescence. Thus, this stage presents an opportune time for the implementation

of efforts aimed at positively impacting trajectories and promoting positive development. As such, it is essential to understand how positive developmental trajectories can be fostered, especially among youth with particular vulnerabilities. Using a resilience model of adolescent development may be helpful in conceptualizing how youth can avoid the long-term negative outcomes associated with a particular vulnerability (Fergus & Zimmerman, 2005). A protective model of resilience examines how resources may moderate or reduce the negative effects of a particular vulnerability (Fergus & Zimmerman, 2005; Luthar, Cicchetti, & Becker, 2000). A set of youth who are particularly vulnerable are youth exposed to interpersonal conflict (e.g., bullying victimized youth).

Interpersonal Factors as Promotive and Protective of Youth Resilience

Social factors, including connectedness, are important for emotional and behavioral resilience among victimized youth. In a systematic review of longitudinal studies, social factors (e.g., adequate social skills, stable family composition, parental attachment, prosocial friendships) were found to interrupt the continuity from bullying involvement (victim and/or perpetrator) to subsequent internalizing and externalizing behaviors (Ttofi, Bowes, Farrington, & Lösel, 2014). Bowes and colleagues (2010) found that a positive home environment, maternal warmth, and sibling warmth were important in fostering emotional and behavioral adjustment for victimized children. Family dinners, considered a proxy for family relations, moderated the relationship between electronic victimization and substance use, internalizing problems, and externalizing behaviors in a school-based sample of 12-18 year-old youth (Elgar et al., 2014). In a cross-sectional study examining a range of factors with the potential to promote resilience among victimized youth, authors found that family connectedness was negatively associated with suicide risk for victims, perpetrators, and victim/perpetrators (Borowsky, Taliaferro, & McMorris, 2013). Desjardins and Leadbeater (2011) examined the buffering effects of maternal and paternal support in the prospective relation between relational victimization and depressive symptoms among an adolescent sample. Though paternal support buffered this relationship, an unexpected and inverse effect was observed with maternal support, where high maternal support predicted elevations in depressive symptoms (Desjardins & Leadbeater, 2011). Further, Burke and colleagues (2017) found that though parental and friend support did not prospectively protect adolescents from the effects of victimization, parental and friend support were both promotive

factors for adolescent well-being, specifically by decreasing depressive symptoms. However, parental or friend support did not buffer the prospective effects that victimization had on depressive symptoms among a sample of Swiss adolescents. Despite inconsistencies, results point to the importance of family contextual factors, including connectedness as being essential when considering the effects of bullying victimization.

Given that a significant proportion of bullying victimization occurs within school settings (Waasdorp & Bradshaw, 2015), understanding the role of school contextual factors is important. Low school connectedness was found to be associated with adjustment problems in a sample of middle school students (Loukas & Pasch, 2012). In a sample of victimized, sexual minority youth, reports of greater connectedness to an adult in school, measured dichotomously, moderated the relationship between victimization and aggressive and suicidal behaviors (Duong & Bradshaw, 2014). In a cross-sectional study that examined gender differences in these associations, authors found that teacher, peer, and school support buffered the effects of victimization on internalizing distress for boys only (Davidson & Demaray, 2007). Of note, increases in school identification and school connectedness have been found to decrease subsequent bullying victimization among a sample of high school students (Turner, Reynolds, Lee, Subasic, & Bromhead, 2014).

Perceptions of peer social support and connectedness are also important given the peer component of bullying victimization. The importance of peer support in moderating the relationship between victimization and suicidal ideation was documented in a large (N = 11,110) cross-sectional sample of European adolescents. In this study, authors found that peer support moderated the relationship between verbal victimization and suicidal ideation (Barzilay et al., 2017). Previous studies have also found that social aspects such as friendship quality, disclosure between friends, and friend support moderate the relationship between bullying victimization and anxiety, depression, and wellbeing more strongly for girls (Cuadros & Berger, 2016; Schmidt & Bagwell, 2007), while others have found that friend emotional support decreased the effects of victimization on internalizing symptoms more for boys (Yeung Thompson & Leadbeater, 2013). Given these findings, additional research examining the impact of peer social support in buffering the effects of victimization are warranted, specifically considering the potential interaction with sex.

Connectedness to non-parent adults, an indicator of community connectedness, was identified as a protective factor for suicide risk among victimized youth (victims, perpetrators, and victim/perpetrators) in a cross-sectional study (Borowsky et al., 2013). However, in a sample of urban youth, neighborhood cohesion ("youths' perceptions of supportive transactions within their neighborhood") was only marginally associated with internalizing problems (Kliewer et al., 2004). Taken together, there is little research examining the protective effects of community connectedness among victimized youth. Additional research examining how community connectedness functions to protect youth from the effects of victimization could justify expanding intervention targets to include facets of youth's communities.

Previous studies have explored the protective role of multiple domains of connectedness (family, other adults, and school) on youth suicide risk and found support for the particular importance of family connectedness (Stone, Luo, Lippy, & McIntosh, 2015). Results suggest that family connectedness most consistently conveys a protective effect against suicidal ideation and behaviors. Family connectedness was the strongest predictor of suicide risk (non-suicidal self-harm, suicidal ideation, suicide behaviors) in a study examining multiple connectedness domains (family, peers, school, adults at school) (Kaminski et al., 2010). A cross-sectional study (including some youth from the current study among other at-risk youth) found an association between higher family, school, and community connectedness and positive youth adjustment (Ewell Foster et al., 2017). Additionally, in a prospective examination of domains connectedness across six months among the current sample of victimized youth, we found a promotive effect of connectedness in that higher levels of family and school connectedness were associated with less depression and suicidal ideation. Higher levels of community connectedness were also associated with less suicidal ideation (Arango et al., 2018).

Some research supports that sex moderates the relationship between connectedness and suicide risk. For example, Logan, Crosby, and Hamburger (2011) found that sex moderated the relationship between family connectedness and suicidal thoughts and behaviors. Specifically, they found that family connectedness was protective against suicidal thoughts and behaviors for girls only among youth living in high-risk communities. Contrastingly, connectedness was associated with increased self-esteem for males only in a longitudinal sample of adolescents (Boutelle, Eisenberg, Gregory, & Neumark-Sztainer, 2009). Shochet and colleagues (2006)

found that school connectedness predicted anxiety for girls only and general functioning for boys only at a one-year follow-up. In a cross-sectional study examining the moderating role of school and family connectedness in the relationship between social isolation and suicide risk, authors found that school connectedness was protective of suicide attempts for boys only (Hall-Lande, Eisenberg, Christenson, & Neumark-Sztainer, 2007). In this sample, family connectedness was protective against suicide attempts for both boys and girls. Thus, a further evaluation examining how the relationships between social connectedness, bullying victimization, and suicide risk vary by sex is warranted.

Study Purpose

The current study is informed by a protective model of youth resilience (Fergus & Zimmerman, 2005; Luthar et al., 2000) and theories of suicide that highlight the importance of social connectedness (Durkheim, 1897; Joiner, 2009; Klonsky & May, 2015). In addition, research provides preliminary support for the role that social connectedness can have in buffering youth from the deleterious effects of bullying victimization. However, few studies have examined these relations prospectively (e.g., Desjardins & Leadbeater, 2011). A prospective examination of these relationships could provide empirical support for targeting connectedness among victimized youth. Moreover, a significant limitation of previous studies is the lack of ethnic and racial diversity within study samples. With one exception (Duong & Bradshaw, 2014), previous study samples were comprised of primarily Caucasian youth. It is important to replicate such studies with more diverse samples to gain a better sense of the generalizability of findings. The current study addresses this gap with a more racially diverse sample within which a majority of participating families reported receipt of public assistance.

Previous research examining the relationship between bullying victimization, social connectedness, and suicide risk has primarily taken a single lensed approach, examining one specific connectedness domain. An examination of multiple domains (family, school, community) of connectedness has the potential to provide us with information about their relative importance to youth outcomes, which could have implications for prevention and intervention. The current study also provides an additional perspective as it examines the role of community connectedness. This perspective is notable as only one cross-sectional study has examined the protective role of community connectedness among victimized youth. Finally,

research examining the interplay between bullying victimization, social connectedness, and suicide risk has infrequently (e.g., Davidson & Demaray, 2007) evaluated how this interplay differs by sex. Given sex differences in suicide risk (Centers for Disease Control and Prevention, 2016; Evans et al., 2005), bullying victimization (Nansel et al., 2001), and connectedness (Arango et al., 2016; Logan et al., 2011) an examination of sex differences is warranted. This study has two primary aims with the goal of addressing these gaps, in addition to several exploratory aims:

1. To examine the prospective relation between bullying victimization severity and suicide risk across a 16-month period within a sample of bullying victimized youth. Outcomes of interest include self-esteem, depression, and suicidal ideation. It is hypothesized that bullying victimization severity will be associated with suicide risk factors.
2. To examine the role of connectedness in three domains (family, school, community) in moderating the prospective relation between bullying victimization severity and suicide risk across a 16-month period. It is hypothesized that family, school, and community connectedness will buffer the impact of all types of bullying victimization on youth suicide risk.

We also conduct exploratory analyses to determine whether relationships among bullying victimization severity, domains of connectedness (family, school, community), and suicide risk vary by sex. In addition, we examine whether connectedness in multiple domains (family, school, community) moderates the relationship between electronic, relational, and overt bullying victimization and suicide risk across 16 months. Finally, we conduct exploratory analyses to examine the role of bullying perpetration in the relationships observed.

Method

Participants

Participants included 142 mostly female youth (74.6%), ages 12 to 15 ($M = 13.6$, $SD = 1.2$) recruited from a hospital-based urgent care clinic and emergency department in the midwestern region of the United States. Youth were recruited for participation in a mentorship-based intervention effectiveness trial targeting youth facing interpersonal problems (Links to Enhancing Teen Connectedness (LET's CONNECT) (King et al., 2018) with the aim of

preventing the onset of suicidal behavior. All participants screened positive for elevated bullying victimization and perpetration and/or low social connectedness (the current study only includes youth who screened positive for elevated bullying victimization). Eligibility criteria included living within a geographic catchment area, fluently speaking English, and no lifetime suicide attempt history. Exclusion criteria included being in police custody or a residential facility, medical inability to participate, severe cognitive impairment or having a sibling in the study. The racial breakdown of the sample was 47.2% African American, 36.6% Caucasian, 6.3% Multiracial, 6.3% identified as "Other." More than 82% of families reported receiving public assistance.

Procedures

Youth presenting to the ED or urgent care clinic who met eligibility criteria (outlined above) were approached by study staff and invited to participate. Following parent consent and youth assent, youth completed a bullying victimization screening measure. Youth who screened positive were assessed for a history of suicidal ideation and attempts. Youth who reported a positive suicide attempt history were excluded from this study as an aim of the LET's CONNECT study was to prevent the first instance of suicidal behavior. Youth and parent/guardians were each thanked for their participation with a gift item purchased from a dollar store.

Youth who screened positive for elevated bullying victimization completed the baseline assessment and were randomized to the LET's CONNECT condition (mentorship-based intervention) or the treatment as usual condition (receipt of community resources). Youth received $25 as compensation for completing the baseline assessment. Study staff members blind to youth's study condition completed in person 6-month and 16-month follow-up assessments with youth and parents/guardians. Youth received up to $50 per assessment as compensation for completing 6-month and 16-month follow-up assessments. Study retention rate for the 6-month and the 16-month follow-up assessments were 72.5% (103 of 142) and 75.4% (107 of 142), respectively. There were no differences in demographic characteristics by retention status ($p >$ 0.05). There was no meaningful pattern of differences in retention by primary study variables at baseline. The mean number of days between the baseline and 6-month follow-up assessment was 206 (SD = 48, range 139 – 373 days). The mean number of days between the 6- and 16-month

follow-up assessments was 295 days (SD = 72, range 70 – 495 days). Protocols and procedures for this study were approved by the University's and respective hospital's Institutional Review Boards.

Measures

All measures described below were administered at baseline, 6-month, and 16-month assessments. Measures administered at 6- and 16-month assessments capture the time between assessments unless otherwise specified.

Bullying victimization and perpetration were measured using the *Peer Experiences Questionnaire (PEQ)* (Prinstein, Boergers, & Vernberg, 2001; Vernberg, Jacobs, & Hershberger, 1999). The PEQ is an 18 item self-report measure of relational and overt aggression in the previous four months. This measure contains two 9-item scales that assess bullying victimization and perpetration. Items are answered on a 5-point scale ranging from "*never*" to "*several times a week.*" Youth endorse questions about whether they had experiences such as being "Hit, kicked, or pushed in a mean way," "Left out of something that you wanted to do," or if they had engaged in these behaviors towards others. Items in both the bullying victimization and the bullying perpetration scales are summed (range = 9 - 45). Positive screens on each scale were defined as a score of 19 and 17 for males and females, respectively. Positive screen scores were set to be a standard deviation higher than the mean score of a previously studied sample of 7th-to 9th-grade students (Vernberg et al., 1999). Given mean sex differences in the severity of bullying victimization and bullying perpetration, thresholds for screening positive were set accordingly for males and females. The PEQ was also used to create relational (5 items) and overt (4 items) victimization/perpetration subscales as indicated by Prinstein et al., 2001. In previous samples, PEQ scores have related to other self-reported measures of victimization (Vernberg et al., 1999), internalizing symptoms, peer aggression, and disruptive behavior disorder (Prinstein et al., 2001). Though many of the items are specific to face to face victimization (e.g., being hit), other items (e.g., being left out of something that you wanted to do) may also capture aspects of electronic victimization. As such, this measure provides a more comprehensive examination of bullying involvement. The Cronbach's alphas in this sample were .79 and .82 for bullying victimization and bullying perpetration, respectively.

Bullying victimization and perpetration in electronic contexts were assessed using a self-

report measure created for this study containing two 4-item scales. Youth were asked whether they had "Repeatedly posted (or received) hurtful messages on a website (e.g., Facebook, Myspace)," "Repeatedly sent (or received) hurtful instant messages," "Repeatedly sent (or received) hurtful e-mails," and "Repeatedly sent (or received) hurtful text messages." Questions were answered as either "yes" or "no." Youth were classified as being involved in electronic victimization if they answered "yes" to one or more of the four questions. In the same manner, youth were classified as being involved in electronic perpetration if they answered "yes" to one or more of the four questions. The Cronbach's alphas for electronic victimization and electronic perpetration in this sample were .72 and .62, respectively.

Family connectedness was measured using the *Parent-Family Connectedness Scale* (Resnick et al., 1997). This self-report measure contains 11 items that assess perceived closeness, connection, and satisfaction with family and parental relationships. Items are answered on a 5-point scale ranging from *"not at all"* to *"very much."* Sample items include "How much do you and your family have fun together?" and "How much do youth think that your mother (father) cares about you." This measure has demonstrated adequate internal consistency across sex, grade level, and race/ethnic groups (Sieving et al., 2001). The Cronbach's alpha in this sample was .90.

School connectedness was measured using the *School Connectedness Scale* (Resnick et al., 1997). This self-report measure contains six items that assess how connected youth feel in the school setting and with classmates. Items are answered on a 5-point scale ranging from *"strongly disagree"* to *"strongly agree."* Sample items include "You feel like you are a part of the school" and "Your teachers care about you." This measure has demonstrated adequate internal consistency across sex, grade level, and race/ethnic groups (Sieving et al., 2001). The Cronbach's alpha in this sample was .85.

Community connectedness was measured using the *Community Connectedness Scale* (A. C. Fletcher & Shaw, 2000). This adapted self-report measure contains three items and assesses how close youth feel to their communities. Items are answered on a 4-point scale ranging from *"strongly disagree"* to *"strongly agree."* Sample items include "I get along with some of the adults in my neighborhood" and "I feel there are adults in my community I can talk with if I needed help or advice." This measure has demonstrated adequate internal consistency, and higher scores are linked with involvement in community activities (A. C. Fletcher & Shaw,

2000). This measure was adapted due to low internal consistency and given specific contextual factors of the community surveyed. For example, items such as "I want to live in my neighborhood when I am an adult" were excluded as it is likely the case that among communities marked by economic disadvantage and violence, these statements may not be indicative of community connectedness. Additionally, by dropping such items, this measure's internal consistency improved notably. The Cronbach's alpha in this sample was .70.

Self-esteem was measured using the *Rosenberg Self-Esteem Scale* (Rosenberg, 1965). This is a 10-item self-report measure of self-liking, self-competence, and self-esteem. Items are answered on a 4-point scale ranging from "*strongly disagree*" to "*strongly agree.*" Sample items include "I take a positive attitude towards myself" and "I feel that I have a number of good qualities." The Rosenberg Self-Esteem Scale is a widely used measure of self-esteem with strong psychometric properties such as strong reliability and internal consistency (Sinclair et al., 2010). The Cronbach's alpha in this sample was .86.

Depression was measured using the *Reynold's Adolescent Depression Scale-2: Short Form* (RADS-2; Reynolds, 2008). This 10-item self-report measure assesses depressive symptoms in youth. Items are answered on a 4-point scale ranging from "*almost never*" to "*most of the time.*" Sample items include "I feel sad" and "I feel like nothing I do helps anymore." The RADS-2 has been shown to have strong internal consistency, test-retest reliability, and criterion validity (Reynolds & Mazza, 1998). The Cronbach's alpha in this sample was .88.

Suicidal ideation severity was measured using the *Suicidal Ideation Questionnaire-Junior* (SIQ-JR; Reynolds, 1988). This 15-item self-report measure assesses suicidal thoughts in the previous month. Items are answered on a 7-point scale ranging from "*I never had this thought*" to "*almost every day.*" Sample questions include "I thought that no one cared if I lived or died" and "I wish I were dead." The SIQ-JR has demonstrated strong psychometric properties (Reynolds, 1988) and predictive validity for suicidal ideation and attempts after a psychiatric hospitalization (King et al., 1995). The Cronbach's alpha in this sample was .93.

Suicidal behaviors were measured using the *Columbia Suicide-Severity Rating Scale* (C-SSRS; Posner et al., 2011). This semi-structured interview-style measure was used to assess actual, aborted, and interrupted suicide attempts and preparatory behaviors. Sample questions include "Have you made a suicide attempt?" and "Have you taken any steps towards making a

suicide attempt or preparing to kill yourself (such as collecting pills, getting a gun, giving away valuables or writing a suicide note)?" Youth were asked about lifetime suicidal behaviors and attempts at the baseline assessment and suicidal behaviors and attempts since the last assessments at the 6-month and 16-month assessments. This is a widely used measure that has demonstrated convergent validity, divergent validity, specificity, and sensitivity (Posner et al., 2011). Additionally, the C-SSRS has predictive validity for subsequent suicide attempts (Gipson, Agarwala, Opperman, Horwitz, & King, 2015; Horwitz, Czyz, & King, 2015).

Alcohol use was measured using the first three items of the *Alcohol Use Disorders Identification Test* (AUDIT-C; Saunders, Aasland, Babor, De la Fuente, & Grant, 1993). Samples questions include "How often do you have a drink with alcohol in it?" and "How often do you have six or more drinks at one time?" Items are answered on a 4-point scale ranging from "*never*" to "*4 or more times a week/daily or almost daily*." This measure has been validated in adolescent samples and has been demonstrated to successfully identify adolescents with alcohol use disorders (Chung, Colby, Barnett, & Monti, 2002). Due to low alcohol use endorsement, the scale was re-coded dichotomously (yes/no) to indicate whether or not the youth reported any alcohol use.

Drug use was measured using eight items from the Monitoring the Future (MTF) study (Johnston, O'Malley, Bachman, & Schulenberg, 2005). The following question is repeated in reference to each drug category "On how many occasions (if any) have you used Drug X during the past month?" Because of low drug use endorsement, items were re-coded dichotomously (yes/no). This measure has been shown to have adequate validity (Johnston & O'Malley, 1985).

Data Analysis Plan

Descriptive statistics (means, standard deviations, percentages) were calculated for primary study variables. We utilized *t*-statistics to examine significant mean changes in variables of interest across the three assessment time points. Pearson correlational analyses were conducted to examine bivariate relationships between primary study variables. Analyses are based on the 142 youth who completed the baseline assessment and include all completed follow up data (352 total observations).

Linear mixed models were used to examine the prospective relationship between severity of bullying victimization and connectedness with suicide risk across 16 months. We conducted

28

separate analyses for each outcome of interest (depression, self-esteem, suicidal ideation). We examined three linear mixed models to study the interaction between bullying victimization severity and level of connectedness (family, school, community) in the prediction of suicide risk (self-esteem, depression, suicidal ideation). We also used linear mixed models to examine whether the relationship between bullying victimization severity and connectedness with suicidal ideation differs by sex. Sex differences were only explored when two-way bullying victimization and connectedness interactions were significant. Thus, we explored two separate models (predicting self-esteem and suicidal ideation) using a three-way interaction term as a predictor (sex*bullying victimization*school connectedness) and including all potential two-way interactions. Linear mixed models were also used when conducting exploratory analyses with electronic, overt, and relational bullying victimization as predictors. The intercept was specified as a random factor in all mixed models conducted, which allowed for variability between individuals, with all other predictors specified as fixed factors. All analyses controlled for intervention status and sex. All predictor variables were centered and standardized to reduce multicollinearity and facilitate interpretability. This data analysis approach was selected over other methods as it enabled us to include all time points in each model and allowed for variability across individuals.

Results

Descriptive Statistics and Key Correlations

Means and standard deviations at the baseline, 6-month, and 16-month assessments for bullying involvement, connectedness (family, school, community), self-esteem, depression, and suicidal ideation are presented in Table 2.1 with statistical information regarding significant changes across the three time points. Generally, bullying victimization and perpetration decreased across time while connectedness largely remained constant. Self-esteem increased, and depression decreased between the 6-month and 16-month assessments, while suicidal ideation remained constant. Table 2.2 depicts Pearson correlations among levels of bullying involvement, domains of connectedness, self-esteem, depression, and suicidal ideation. Relationships were in the expected directions. Notably, bullying victimization and perpetration were negatively associated with family and school connectedness. Family and school connectedness were positively associated with self-esteem and negatively associated depression and suicidal ideation.

Community connectedness was positively associated with self-esteem and negatively to depression.

Sex Differences. Sex differences were observed in variables of interest across time points. At baseline, 6- and 16-month follow-up assessments, family connectedness was higher for males ($p < 0.05$). At the 16-month follow-up assessment, school connectedness was higher for males ($p < 0.05$). Depression was higher for females at the baseline and 16-month follow-up assessment ($p < 0.05$). Suicidal ideation was higher for females at the baseline assessment and 6-month follow-up assessment ($p < 0.05$). Self-esteem was higher for males at the baseline assessment ($p < 0.05$) although no sex difference was evident at 16-month follow-up.

Suicidal Behaviors. At the baseline assessment, 29 of 142 (20.4%) youth reported engaging in any suicidal behavior (interrupted attempt, aborted attempt, and/or suicide preparatory behavior). Given the exclusion criteria described above, there were no youth with a suicide attempt history at the baseline assessment. At the 6-month assessment, 14 of 103 (13.6%) youth reported engaging in any suicidal behavior (interrupted attempt, aborted attempt, suicide preparatory behavior, and/or suicide attempt) since the baseline assessment, and 6 of 103 (5.8%) of these youth reported that they had made a suicide attempt. At the 16-month follow-up assessment, 10 of 107 (9.3%) youth reported engaging in any suicidal behavior (interrupted attempt, aborted attempt, suicide preparatory behavior, and/or suicide attempt) and 5 of 107 (4.7%) of these youth reported that they had made a suicide attempt during the preceding 10 months. Due to the low frequency of suicidal behavior at the follow-up assessments (21 total youth), we were unable to fit models with suicidal behavior as the dependent variable.

Substance Use. At the baseline assessment, 8 of 142 youth (5.6%) reported any illicit drug use in the previous 30 days. Illicit drug use (in the previous month) increased to 19.4% (20 of 103) and 19.6% (21 of 107) at the 6- and 16-month follow up assessments, respectively. At the baseline assessment, 5.6% of youth (8 of 142) reported any alcohol use. Alcohol use increased to 15.5% (16 of 103) and 16.8% (18 of 107) at the 6- and 16-month follow up assessments, respectively. Due to the low frequency of illicit substance and alcohol use at the follow-up assessments, we were unable to fit models with alcohol and substance use as the dependent variable.

Electronic Victimization and Perpetration. Electronic victimization was reported by 52.8% of youth at the baseline assessment (75 of 142). At the 6- and 16-month follow up assessments, 47.5% (49 of 103) and 30.8% (33 of 107) of youth reported electronic victimization, respectively. Approximately one in four youth (33 of 142) reported electronic perpetration at the baseline assessment. At the 6- and 16-month follow up assessments, approximately 22% (23 of 103) and 16% (17 of 107) of youth reported electronic perpetration, respectively. Youth who reported electronic victimization or perpetration reported significantly higher bullying victimization and perpetration than youth who did not ($p < .05$). Additionally, youth who reported electronic victimization or perpetration reported significantly lower family and school connectedness than youth who did not report these experiences ($p < .05$).

Primary Study Aims

  Aim 1: Impact of Bullying Victimization and Connectedness on Suicide Risk. Results of the mixed models examining the impact of bullying victimization and connectedness (within family, school, relational domains) on continuous outcomes are displayed in Table 2.3. Relationships between bullying victimization, domains of connectedness, self-esteem, depression, and suicidal ideation were in the expected directions. Notably, family, school, and community connectedness were positively associated with self-esteem, while bullying victimization was negatively associated with self-esteem. Similarly, family and school connectedness were negatively associated with depression, while bullying victimization was positively associated with depression. Results of the model predicting suicidal ideation indicated negative associations between domains of connectedness (family, school, community) and suicidal ideation and a positive association between bullying victimization and suicidal ideation. Generally, no sex or intervention effects were observed in the three models described above. However, in the current sample of victimized youth, the intervention had a positive effect on youth depression. Please refer to King et al., 2018 for complete intervention results and discussion.

  Aim 2: Interactions between Bullying Victimization and Connectedness in Relation to Suicide Risk. Results of the linear mixed models examining interactions between bullying victimization and connectedness domains (family, school, relational) on continuous outcomes are displayed in Table 2.4. Notably, school connectedness buffered the relationship between bullying

victimization and self-esteem and suicidal ideation (see Figures 2.1 and 2.2). Results indicated that among youth with higher victimization, increased school connectedness was associated with higher self-esteem and lower suicidal ideation.

Exploratory Analyses

Sex Differences in Interactions between Bullying Victimization and Connectedness.
Mixed models testing three-way interactions (sex*bullying victimization*school connectedness) did not yield significant findings. Results did not indicate significant sex differences in the interaction between bullying victimization and school connectedness in predicting self-esteem (*Est* = 0.15, *p* = .775), 95% confidence interval [-0.90, 1.21] or suicidal ideation (*Est* = 0.75, *p* = .610), 95% confidence interval [-2.14, 3.64].

Subtypes of Victimization. Exploratory analyses were also conducted to examine the impact of overt and relational types of victimization separately. Relational victimization was negatively associated with self-esteem (*Est* = -1.22, *p* < 0.05), 95% confidence interval [-1.83, -0.62] and positively associated with depression (*Est* = 1.22, *p* < 0.05), 95% confidence interval [0.56, 1.88] and suicidal ideation (*Est* = 2.90, *p* < 0.05), 95% confidence interval [1.22, 4.57]. However, overt victimization was not significantly associated with self-esteem, depression, or suicidal ideation (*p* > 0.05). Interaction models examining whether connectedness domains buffered the relationship between relational victimization and suicide risk yielded a significant interaction between relational victimization and school connectedness in the prediction of self-esteem. Results indicated that among youth with higher relational victimization, higher school connectedness was associated with higher self-esteem (*Est* = 0.66, *p* < 0.05), 95% confidence interval [0.15, 1.17].

Electronic victimization was negatively associated with self-esteem (*Est* = -1.59, *p* < 0.05), 95% confidence interval [-2.85, -0.32] and positively associated with depression (*Est* = 2.11, *p* < 0.05), 95% confidence interval [0.76, 3.46] and suicidal ideation (*Est* = 6.05, *p* < 0.05), 95% confidence interval [2.91, 9.18]. Exploratory analyses examined the interaction between electronic victimization (yes/no) and connectedness domains in relation to suicide risk outcomes (self-esteem, depression, suicidal ideation) (see Table 2.5). Results indicated a significant interaction between electronic victimization and school connectedness in predicting suicidal

ideation. Among youth who reported experiences with electronic victimization, school connectedness attenuated suicidal ideation (see Figure 2.3).

Bullying Perpetration. In addition to meeting criteria for bullying victimization, 18.3% (26 of 142) of youth also met a positive screen for bullying perpetration (one standard deviation above the mean of a previously studied sample). Exploratory analyses revealed a similar pattern of findings when analyses were conducted without youth who were both victims and bullies such that school connectedness buffered the relationship between bullying victimization and outcomes (self-esteem and suicidal ideation). Additionally, when controlling for the severity of bullying victimization, bullying perpetration was not predictive of self-esteem, depression, or suicidal ideation ($p > .05$).

Discussion

The present study examined whether domains of connectedness prospectively buffer the positive relation between victimization severity and suicide risk among a sample of victimized youth. Although family, school, and community connectedness were prospectively associated with suicide risk factors (self-esteem, depression, suicidal ideation), school connectedness was found to protect youth against the negative impact of victimization on self-esteem and suicidal ideation. Specifically, higher school connectedness among severely victimized youth was associated with higher self-esteem and lower suicidal ideation. Similarly, school connectedness buffered the negative relationship between electronic victimization and suicidal ideation and between relational victimization and self-esteem. Findings are in line with theories of suicide highlighting the importance of interpersonal connectedness (Durkheim, 1897; Joiner, 2009; Klonsky & May, 2015) and with a protective model of youth resilience as school connectedness reduced the negative impact of bullying victimization (Fergus & Zimmerman, 2005; Luthar et al., 2000). Results have important implications as school connectedness is a potentially malleable experience through which we could reduce the impact of victimization.

The Role of School Connectedness

Results align with and expand upon extant literature to highlight school connectedness as a malleable factor with the potential of attenuating suicide risk among a high-risk sample. Broadly, a sense of belongingness in the school setting is associated with increased academic achievement, prosocial behaviors, psychosocial wellbeing and decreased psychopathology and

behavioral risk-taking (Aldridge & McChesney, 2018; M.-T. Wang & Degol, 2016). Studies converge to indicate that teacher connectedness is linked to higher grades, standardized test scores, and academic motivation (Esposito, 1999; H. Patrick, Ryan, & Kaplan, 2007; M.-T. Wang & Holcombe, 2010). Moreover, higher school connectedness is related to lower bullying victimization (Zaykowski & Gunter, 2012) and behavioral problems (A. Fletcher, Bonell, & Hargreaves, 2008; LaRusso, Romer, & Selman, 2008; M.-T. Wang, Selman, Dishion, & Stormshak, 2010). As related to the present findings, school connectedness has been consistently linked to psychological adjustment (Aldridge & McChesney, 2018; Way, Reddy, & Rhodes, 2007). A recent meta-analysis concluded that higher school connectedness is related to lower risk of suicidal thoughts and behaviors (Marraccini & Brier, 2017).

Few studies have examined the prospective relationship between school connectedness and suicide risk factors or how school connectedness functions to buffer the effects of victimization, especially while considering other domains of connectedness. Conclusions from the present study are consistent with findings of two cross-sectional studies pointing to school connectedness as a potential moderator in the relationship between victimization and adverse outcomes (Davidson & Demaray, 2007; Duong & Bradshaw, 2014). In a cross-sectional sample of sexual minority youth, Duong and Bradshaw (2014) found that school connectedness moderated the effects of bullying victimization in the school setting and electronic victimization on suicidal behaviors. Similarly, Davidson and Demaray (2007) found that school connectedness protects youth from the effects of victimization on internalizing distress. In studies examining the protective role of multiple connectedness domains on suicide risk (not specifically among victimized youth), findings have pointed to the importance of both family (Kaminski et al., 2010; Stone et al., 2015) and school connectedness (Gunn et al., 2018).

The buffering role of school connectedness among victimized youth may be due to several factors, including that victimization frequently occurs in the school setting (Waasdorp & Bradshaw, 2015). It may be that students who have a strong sense of school connectedness feel like they have someone to turn to in the face of victimization. Moreover, victimized students who feel connected may also experience increased confidence and comfort in turning to trusted teachers or staff members following instances of victimization. In line with this, research indicates that a high sense of belongingness and solidarity is associated with increased student

willingness to intervene in instances of peers' risky behaviors (Syvertsen, Flanagan, & Stout, 2009). High school students who feel supported by school staff and teachers are more likely to have positive attitudes about seeking help in the face of bullying victimization or violent threats (Eliot, Cornell, Gregory, & Fan, 2010). Additionally, students who feel connected to their school may trust that school staff will effectively tackle student concerns and take disciplinary action in instances of victimization (M.-T. Wang & Degol, 2016). It may also be that youth who feel meaningful connections within the school setting are more likely to be identified by teachers or staff if they are struggling with interpersonal conflict or internalizing distress.

Items in our measure of school connectedness such as "You feel close to people at your school" may have also captured aspects of peer support. The importance of peer support in moderating the relationship between victimization and wellbeing, internalizing symptoms and suicidal ideation has been documented in cross-sectional and longitudinal studies (Barzilay et al., 2017; Cuadros & Berger, 2016; Schmidt & Bagwell, 2007; Yeung Thompson & Leadbeater, 2013). Though we did not find any sex differences in the relationship between bullying victimization, school connectedness, and adverse outcomes (low self-esteem, suicidal ideation), previous studies have found that social aspects such as friendship quality, disclosure between friends, and friend support buffer the effects of bullying victimization on internalizing symptoms and wellbeing differentially for boy and girls (Cuadros & Berger, 2016; Schmidt & Bagwell, 2007; Yeung Thompson & Leadbeater, 2013). However, findings delineating the role of sex are inconclusive. Given findings from previous studies, additional studies examining the implications of sex in the relationships examined is warranted. It may be the case that the sample size of the current study could have impacted our ability to detect differences by sex. Notably, our sample was only about a fourth male. This limited our ability to examine how the relationship between victimization, connectedness and suicide risk functioned by sex.

A sense of belongingness in the school context may also be especially important to youth as they transition into and through adolescence, which is the developmental period characterizing youth in this study. This stage is marked by significant changes in social relationships including increased importance of and reliance on peers (Arnett, 2014; Buhrmester, 1998; DiClemente et al., 2009; Smetana et al., 2006). A strong sense of connectedness in the school environment, a place where youth spend a substantial proportion of their time, may facilitate the development of

secure social attachments, a protective factor for youth. In addition to forming strong peer relationships, adolescence is a time where a central goal is increased independence. School connectedness may play a role in improving competence and independence by providing a sense of support and a safe environment through which youth can increase in self-reliance and feel safe in taking risks (Pianta & Hamre, 2009; M.-T. Wang & Degol, 2016). Taken together, the positive impact of a strong sense of school connectedness likely cascades into other areas, further promoting positive youth adjustment.

The role of school connectedness may be particularly relevant when considering that the present sample was recruited in a community faced with substantial social and economic disadvantages (e.g., the majority of families reported receipt of public assistance). However, future research is needed that examines how school connectedness is protective for youth living in a range of communities, including those with limited resources. In such communities, the school setting may provide a sense of consistency and safety for youth who otherwise may experience frequent changes and instability in their family system or home environment. Moreover, parents from lower socioeconomic backgrounds and lower education levels are less likely to be involved in their child's schooling (Hill & Taylor, 2004) and family-school involvement is a predictor of school belongingness in youth (Uslu & Gizir, 2017). A sense of school connectedness is not only bolstered in the school setting but is also impacted by parent-teacher interactions and school-community relations. Having a school community where youth feel supported, are held accountable, and are reinforced for positive behaviors can be an important and relevant protective factor. Notably, youth from lower socioeconomic backgrounds report more experiences with bullying victimization (Due, Merlo, et al., 2009) and the relationship between victimization and depression is stronger among individuals from low childhood socioeconomic backgrounds (Due, Damsgaard, Lund, & Holstein, 2009). Accordingly, school connectedness was negatively associated with suicidal ideation among a sample of youth residing in communities with high poverty, unemployment, and crime rates (Kaminski et al., 2010). Thus, school connectedness may be particularly important among victimized youth from low-income backgrounds and findings provide a rationale for efforts aimed at increasing connectedness in such communities.

Taken together, study findings support efforts that promote and strengthen school connectedness to attenuate the impact of victimization and reduce suicide risk. School settings provide an opportunity to reach many youth at one time. Considering that school connectedness decreases with age (Whitlock et al., 2014), programs and efforts that increase school connectedness could strengthen student's support system as they navigate interpersonal challenges frequently faced during adolescence. Previous research indicates that school-based programs can positively impact students' sense of school connectedness. In a systematic review that included sevens studies, authors found support for four programs (Battistich, Schaps, Watson, Solomon, & Lewis, 2000; Catalano, Oesterle, Fleming, & Hawkins, 2004; Hawkins, Catalano, Kosterman, Abbott, & Hill, 1999; Wenzel, Weichold, & Silbereisen, 2009) that positively impacted school connectedness (Chapman, Buckley, Sheehan, & Shochet, 2013). For example, the Life Skills Program Information + Psychosocial Competence = Protection (IPSY) is a universal prevention school-based program with the goal of improving school connectedness and reducing substance use (Wenzel et al., 2009). Through teacher-led lessons, the program focuses on presenting youth with intrapersonal and social skills information (i.e., effective problem solving, communication strategies, coping skills), illicit substance use information, and substance refusal skills. Uniquely, the IPSY program incorporates modules specifically regarding youth's school experiences, including school attitudes, and balancing academic and leisure activities. Within a large sample (N = 952) of youth ages 10-13, results indicated positive intervention effects on school connectedness and alcohol use. Moreover, youth who participated in the Seattle Social Development Project Interventions program, a comprehensive school-based program for grades 1 through 6, reported significantly higher school commitment and school attachment at age 18 (Hawkins et al., 1999). School-based mentorship programs among 6th through 10th graders have also been found to increase student's sense of connectedness (Gordon, Downey, & Bangert, 2013). Despite support for the effectiveness of some school-based interventions for improving connectedness, no studies have reported the effects of such interventions on suicidal ideation, suicide behaviors or bullying victimization. By incorporating components aimed at reducing victimization and raising awareness regarding suicide risk and interventions, such efforts could potentially have broader implications.

Focusing on efforts (e.g., prevention strategies, interventions, school policies) that facilitate school connectedness is important given that bullying prevention interventions have demonstrated inconsistent outcomes and that increased school connectedness has been linked to lower victimization (Arango et al., 2018). In a recent systematic review of 17 studies, authors found that the majority of bullying victimization interventions evaluated did not show positive long-term effects on reducing bullying behaviors. (Cantone et al., 2015). Authors also concluded that school-wide interventions were typically more effective than interventions at the classroom level. Meta-analysis findings have concluded that longer and more intensive interventions are related to reductions in victimization (Ttofi et al., 2011). Authors found that effective interventions generally decreased bullying victimization by approximately 20%. Effective programs, such as the KiVa program developed in Finland, typically have components including "universal and bullying specific actions to prevent the emergence of new cases of bullying, stop ongoing bullying, and reduce the negative consequences of victimization" (Salmivalli & Poskiparta, 2012). The KiVa program, which has been implemented and evaluated in over 200 schools, has been found to reduce bullying victimization and increase empathy of other victimized youth as well as cultivate as a sense of self-efficacy to defend peers (Kärnä et al., 2011; Salmivalli & Poskiparta, 2012; Salmivalli, Poskiparta, Ahtola, & Haataja, 2013). Future efforts could focus on integrating approaches for school connectedness and the prevention of bullying victimization and evaluate outcomes including connectedness, victimization, and suicide risk.

Exploratory analyses revealed no sex differences in the relationship between bullying victimization, school connectedness, and adverse outcomes (low self-esteem, suicidal ideation). Results may be related to a smaller sample size that may have prevented the detection of smaller sex differences. Given differences in rates of depression, suicidal ideation, and connectedness between boys and girls, additional studies with larger samples should examine the role of sex in these relationships. By delineating these associations, approaches can be further specified. For example, it may be that the influence of school connectedness is more potent for girls and, as such, efforts to increase connectedness in this domain can be highlighted among girls. Alternatively, additional studies may align with the findings presented in the current study and,

as such, support more global approaches aimed at reducing victimization and bolstering school connectedness across all students.

The Promotive Role of Family and Community Connectedness

Family and community connectedness did not significantly buffer youth from the impact of bullying victimization on suicide risk. As mentioned above, it may be that as victimization frequently occurs in the context of schools, the immediate support accessed in the school setting is of most importance. Findings may also be reflective of sample and community characteristics. Specifically, many youth in our study were recruited from communities with high instances of violence and family structure was variable. Given some of this variability, schools may be particularly well situated as a consistent source that can directly impact the effects of victimization. Despite the lack of findings supporting a protective model, family and community connectedness were found to be promotive of reduced suicide risk. Specifically, among this sample of victimized youth, higher family connectedness was associated with higher self-esteem, lower depression, and less suicidal ideation across sixteen months. Similarly, community connectedness was prospectively associated with higher self-esteem and lower suicidal ideation.

Findings supporting the relationship between family connectedness and reduced suicide risk are in accordance with previous literature that indicates that family connectedness and other adult connectedness are associated with decreased likelihood of suicide attempts (Stone et al., 2015). Specifically, Stone and colleagues (2015) found that family connectedness had the strongest and most consistent relationship with decreasing risk when compared to other domains of connectedness. Similarly, Kaminski and colleagues (2010) found that, as compared to other domains of connectedness, family connectedness was the strongest predictor of reduced suicide risk (non-suicidal self-harm, suicidal ideation, suicide behaviors). Considering these relationships is significant as changes in family connectedness can be highlighted as treatment targets when working with youth at increased suicide risk as related to a history of victimization or other vulnerabilities. Results from the current and previous studies support efforts made to bolster youth's sense of connectedness to family members. Such efforts could be both in the form of prevention (e.g., identifying families at higher risk of having a child with psychopathology and working on building family bonds) or intervention (e.g., after a youth presents for care with concerns related to victimization or other vulnerabilities, efforts can be

placed on bolstering family relationship). Specifically, programs for suicidal youth that include both an individual and family component appear to be the most promising in impacting both suicidal ideation and self-harm (Calear et al., 2016).

Findings in regards to community connectedness are in accordance with previous studies noting a negative relationship between community connectedness (or connectedness to non-parent adults) and suicide risk factors (Borowsky et al., 1999; Kaminski et al., 2010; Taliaferro & Muehlenkamp, 2014). As youth establish connections and bonds in their community, they may be more likely to serve their communities as they provide and receive care and support, and this has been associated with perceived meaning and purpose (Townsend & McWhirter, 2005; Whitlock et al., 2014). Moreover, by establishing connectedness as part of a community, youth may have greater access to community resources and programs that can build their social support system more broadly and facilitate access to assistance as needed. Additionally, youth who reside in communities characterized by higher crime and lower average income may especially benefit from a sense of connectedness to their community. It may be that finding pockets of support within a community facing social and economic difficulties promotes positive coping and resilience. Taken together, it will be important to continue evaluating the impact of different domains of connectedness among samples of youth at increased suicide risk due to victimization or other vulnerabilities.

Subtypes of Bullying Victimization

Among our sample of victimized youth, the severity of victimization was prospectively associated with lower self-esteem and higher levels of depression and suicidal ideation. These results are consistent with previous prospective findings based on 6-month follow-up data from the present sample (Arango et al., 2018) and with dozens of studies linking bullying victimization to psychopathology and suicidal ideation (see Van Geel et al., 2014 and Moore et al., 2018 for recent meta-analyses). The relationship between bullying victimization and suicidal ideation has been substantiated in children and adolescents, males and females, and youth engaged in bullying as victims and perpetrators (Van Geel, Vedder, & Tanilon, 2014).

Analyses separating victimization into relational and overt victimization further clarified this relationship. In the present sample, relational victimization was associated with lower self-esteem and higher depression and suicidal ideation. However, such associations were not found

between overt victimization and the adverse outcomes examined. Several studies have examined the effects of subtypes of victimization on suicide risk specifically (Barzilay et al., 2017; Dempsey, Haden, Goldman, Sivinski, & Wiens, 2011; Heilbron & Prinstein, 2010; Jantzer, Haffner, Parzer, Resch, & Kaess, 2015); however, findings are somewhat inconsistent. For example, Barzilay and colleagues (2017) examined the associations between subtypes of bullying victimization (relational, verbal, physical) and suicidal ideation and attempts within a large (N = 11,110) cross-sectional sample of European adolescents. Results indicated that physical and relational victimization increased the likelihood of suicidal ideation by 39% and 28%, respectively. Moreover, other studies have found that overt and not relational victimization is associated with increased suicidal ideation and attempts (Dempsey et al., 2011; Heilbron & Prinstein, 2010). Jantzer and colleagues (2015) found that social and verbal victimization were associated with suicidal behaviors (suicidal ideation and attempts) when examining several facets of victimization (physical, verbal, social, cyber, other). However, with the exception of Heilbron and Prinstein (2010), previous studies have been cross-sectional in nature, giving us little insight into how these relationships function prospectively. In a recent meta-analysis examining the relationship between overt and relational victimization on social and psychological adjustment, relational victimization was more strongly associated with internalizing problems than overt victimization (Casper & Card, 2017). Findings from studies attempting to delineate the effects of subtypes of victimization are inconclusive. The present prospective study builds on this literature by examining a sample of victimized youth. Given the importance of social relationships in the developmental period examined, it may be that relational offenses carry the most weight in impacting adverse outcomes. This is especially true when considering how central relational components are to understanding suicide risk in adolescence. Theories of suicide converge in highlighting the importance of relational aspects when comprehensively conceptualizing suicide risk (Durkheim, 1897; Joiner, 2009; Klonsky & May, 2015).

Notably, our sample was recruited from an underserved, racially diverse community characterized by sparse economic resources and high crime and violence rates. As such, our findings may also reflect the impact of living in a community heavily impacted by crime and violence. It may be the case that youth are desensitized to overt experiences of violence, thus

lessening their impact. However, additional research is needed to explore how living in communities impacted by violence and crime relates to how youth are impacted by overt victimization experiences. Additionally, findings may be related to lower reports of overt victimization as compared to relational victimization in the present sample. Finally, it may be difficult for teachers or other adults to identify and intervene when relational offenses (e.g., being excluded, spreading rumors) occur as compared to overt offenses (e.g., hitting, shoving) and this may intensify the impact of relational victimization. Youth may also struggle to identify relational offenses as victimization, potentially decreasing the likelihood that they seek support from others. Taken together, it may be that as peer relationships gain importance, relational offenses may be more impactful (Casper & Card, 2017; Yeung Thompson & Leadbeater, 2013).

This study's findings pertaining to electronic victimization converge with those of Duong and Bradshaw (2014) in that school connectedness moderated the relationship between electronic victimization and suicidal ideation. Despite the limitation inherent in using a newly developed measure with unknown psychometric properties, electronic victimization was related to all variables examined in the expected directions (positively with depression, suicidal ideation, bullying victimization and negatively with self-esteem). Findings regarding the negative impact of electronic victimization are important given substantial technological advances that allow youth to interact with peers anytime, giving youth who are victimized minimal opportunities to escape victimization. Moreover, some instances of electronic victimization (e.g., posting a picture or comment on a social media page) may be visible to others for indefinite amounts of time, and thus more impactful to the victimized youth. Our finding that school connectedness, and not family or community connectedness buffered the impact of electronic victimization highlights the important role that schools can function even when victimization occurs off school grounds. Moreover, it is important to remember that youth who are electronically victimized are rarely not victimized in other contexts (Salmivalli, Sainio, et al., 2013; Waasdorp & Bradshaw, 2015). As such, it may be that instances of electronic victimization are extensions of victimization in other contexts (i.e., schools, neighborhoods) by the same peers or group of peers.

Bullying Perpetration

Only a small proportion of our sample (< 20%) reported elevated experiences with

bullying perpetration (one standard deviation higher than the mean bullying perpetration of a previously studied sample) ([Vernberg et al., 1999](#)). Prevalence estimates of bullying victimization and perpetration vary widely with some studies reporting a similar prevalence of victimization and perpetration ([Modecki et al., 2014](#)) while others report a significantly higher prevalence of bullying victimization compared to bullying perpetration ([Thomas et al., 2017](#)). Lower reports of aggression are likely related to the self-report methodology utilized in this study. Previous studies utilizing self-report methodology have yielded estimates of bullying victimization that are much lower than bullying perpetration ([Thomas et al., 2017](#); [Zych, Farrington, Llorent, & Ttofi, 2017](#)). Among this sample of victimized youth, we did not find that the severity of bullying perpetration predicted self-esteem, depression, or suicidal ideation (while controlling for bullying victimization). Findings are in contrast with previous studies linking the severity of bullying perpetration to suicide risk ([Holt et al., 2015](#)). Our unique findings may be due to the low endorsement of bullying perpetration and to our unique sample of victimized youth. Moreover, analyses revealed a similar pattern of findings when youth who met criteria for bullying perpetration (one standard deviation above the mean of a previously studied sample of youth) were excluded from analyses. Future studies, with larger samples, should continue to examine how to protect youth who are bullying perpetrators from the adverse effects of these behaviors.

Limitations and Future Directions

Our findings should be considered in light of several important limitations. First, the generalizability of findings is limited by our sampling strategy. Youth were recruited from a single hospital in an urban midwestern region of the United States. Additionally, the community where youth were recruited has faced several unique social and economic challenges and is marked by high poverty and crime rates. Though this allowed us to examine protective factors among youth likely experiencing more than victimization, additional studies with diverse samples are warranted. Moreover, youth were recruited as a part of a randomized controlled trial. Through the intervention, some youth received community mentorship with the goal of improving their sense of belongingness and increasing social support. Though all analyses controlled for intervention status, replication studies are needed in more naturalistic samples. Although we were able to examine relationships across a developmentally important stage (the

transition into adolescence), additional studies using longer-term follow-ups will be important to better understand when prevention might be the most fruitful.

Additionally, our measures of community connectedness and electronic victimization had limitations. Our community connectedness measure was adapted due to low internal consistency and to exclude questions that may not be reflective of community connectedness in the study sample. Additional studies should thus examine the potential protective role of community connectedness utilizing a more comprehensive and sensitive measure. There are also limitations with the categorical measure of electronic victimization used that was created for the current study. Though relationships examined were in the expected directions, the use of a more comprehensive continuous measure of electronic victimization, with known psychometric properties, is warranted. The use of a continuous variable would allow to examine the severity of electronic victimization and changes in electronic victimization prospectively.

It is important to note that our sample was primarily comprised of females (74.5%). This impacts the generalizability of our results, as well as our ability to examine differences by sex. Though we conducted exploratory analyses to examine the three-way interaction between school connectedness, bullying victimization, and sex in predicting self-esteem and suicidal ideation, our analyses were likely underpowered to detect differences by sex. Given significant differences in suicide risk and connectedness between males and females, future studies should place efforts in recruiting samples with higher proportions of males.

Finally, given the complex nature of youth's social context, there are likely additional important factors that we did not capture. For example, our finding that school connectedness is an important protective factor among victimized youth should be considered in light of the conceptualization of school climate as a multidimensional construct (García-Moya, Bunn, Jiménez-Iglesias, Paniagua, & Brooks, 2018). In the current study, we focus on the community aspect of school climate, which includes connectedness. Other domains of school climate that could be examined in future studies include school safety, academic climate, and institutional environment (Aldridge & McChesney, 2018). More nuanced examinations of these constructs could delineate specific aspects that could be beneficial to include in intervention efforts.

Conclusions

The present study adds to our understanding of how interpersonal factors may function to protect youth from the negative effects of adverse events. We used longitudinal data to examine how multiple domains of connectedness function to prospectively protect youth who are victimized. Findings indicated that though family, school, and community connectedness were prospectively associated with suicide risk factors (self-esteem, depression, suicidal ideation), only school connectedness buffered the negative impact of victimization on self-esteem and suicidal ideation. We found that increased school connectedness was associated with higher self-esteem and lower suicidal ideation among severely victimized youth. Similarly, school connectedness buffered the negative impact of electronic victimization on suicidal ideation and relational victimization on self-esteem. Exploratory analyses revealed no sex differences in the relationship between bullying victimization, school connectedness, and adverse outcomes (low self-esteem, suicidal ideation). The findings contribute to the literature by using a more racially and socioeconomically diverse sample of victimized youth and including strong measures of bullying victimization, school connectedness, and suicidal ideation.

Table 2.1. *Baseline, 6-month, and 16-month sample characteristics*

	Baseline (N = 142)	6-month follow-up (n = 103)	16-month follow-up (n = 107)
		M (SD)	
Bullying Involvement			
Victimization	22.54 (5.35)[a,b]	17.12 (6.04)[c]	15.16 (5.24)
Relational	13.81 (3.27)[a,b]	10.49 (3.80)[c]	9.01 (3.38)
Overt	8.73 (3.35)[a,b]	6.62 (2.86)	6.06 (2.45)
Perpetration	14.24 (4.85)[a,b]	11.99 (3.94)	11.23 (2.97)
Relational	8.44 (3.07)[a,b]	6.93 (2.41)	6.38 (1.91)
Overt	5.79 (2.41)[a,b]	5.05 (1.97)	4.85 (1.37)
Connectedness			
Family Connectedness	40.08 (9.20)	40.07 (8.95)[c]	39.01 (9.88)
School Connectedness	20.13 (5.95)	20.86 (6.18)	21.15 (5.47)
Community Connectedness	8.04 (2.52)	7.75 (2.63)	8.06 (2.95)
Suicide Risk Factors			
Self-esteem	18.72 (6.55)	18.84 (6.25)[c]	20.16 (6.82)
Depression	22.85 (6.99)[b]	22.75 (6.89)	21.49 (7.53)
Suicidal Ideation	13.19 (15.46)	12.73 (14.28)	12.15 (16.11)

Note. Bullying victimization and perpetration measured by Peer Experiences Questionnaire (range 9-45); family connectedness measures by Parent-Family Connectedness Scale (range 11-55); school connectedness measured by School Connectedness Scale (range 6-30); community connectedness scale measured by Community Connectedness Scale (range 3-12); self-esteem measured by Rosenberg Self-esteem Scale (range 0-30); depression measured by Reynold's Adolescent Depression Scale (range 10-40); suicidal ideation measured using Suicidal Ideation Questionnaire-Junior (range 0-90).

[a] Baseline mean significantly different from mean at 6 months, $p < 0.05$

[b] Baseline mean significantly different from mean at 16 months, $p < 0.05$

[c] 6-month mean significantly different from mean at 16 months, $p < 0.05$

Table 2.2. *Correlations between levels of connectedness, bully victimization, self-esteem, depression, and suicidal ideation*

Variables	1	2	3	4	5	6	7
1. Bully Victimization							
2. Bully Perpetration	0.44*						
3. Family Connectedness	-0.16*	-0.15*					
4. School Connectedness	-0.22*	-0.11*	0.38*				
5. Community Connectedness	-0.01	-0.08	0.24*	0.30*			
6. Self-esteem	-0.29*	-0.12*	0.49*	0.50*	0.29*		
7. Depression	0.30*	0.20*	-0.52*	-0.48*	-0.24*	-0.74*	
8. Suicidal Ideation	0.30*	0.21*	-0.39*	-0.36*	-0.24	-0.57*	0.61*

Note. $* = p < 0.05$. Analyses' n's ranged from 350 to 352.

Table 2.3. *Linear mixed models examining victimization and connectedness subtypes (family, school, community) as related to self-esteem, depression, and suicidal ideation*

	Estimate	SE	95% CI		p
Self-Esteem					
Intercept	19.12	0.84	17.47,	20.77	.000
Sex	-0.22	0.87	-1.95,	1.51	.801
Intervention	0.62	0.73	-0.82,	2.06	.396
Victimization	-0.98	0.24	-1.45,	-0.50	.000
Family Connectedness	2.22	0.33	1.57,	2.87	.000
School Connectedness	1.73	0.30	1.13,	2.32	.000
Community Connectedness	0.74	0.27	0.21,	1.27	.006
Depression					
Intercept	20.79	0.91	18.99,	22.58	.000
Sex	0.75	0.95	-1.12,	2.62	.430
Intervention	1.68	0.79	0.13,	3.24	.034
Victimization	1.06	0.26	0.53,	1.58	.000
Family Connectedness	-2.59	0.36	-3.31,	-1.88	.000
School Connectedness	-1.71	0.33	-2.36,	-1.06	.000
Community Connectedness	-0.42	0.30	-1.01,	0.16	.155
Suicidal Ideation					
Intercept	9.72	2.07	5.62,	13.81	.000
Sex	3.56	2.17	-0.72,	7.84	.103
Intervention	0.20	1.78	-3.33,	3.73	.910
Victimization	3.52	0.68	2.19,	4.85	.000
Family Connectedness	-3.79	0.88	-5.52,	-2.05	.000
School Connectedness	-2.22	0.82	-3.83,	-0.61	.007
Community Connectedness	-1.65	0.74	-3.11,	-0.20	.026

Table 2.4. *Linear mixed models examining the interactions between victimization and connectedness subtypes (family, school, community) as related to self-esteem, depression, and suicidal ideation*

	Estimate	SE	95% CI		p
Self-Esteem					
Intercept	19.17	0.84	17.51,	20.82	.000
Sex	-0.13	0.88	-1.86,	1.60	.884
Intervention	0.60	0.73	-0.84,	2.04	.413
Victimization	-0.97	0.24	-1.44,	-0.50	.000
Family Connectedness	2.23	0.33	1.57,	2.89	.000
School Connectedness	1.64	0.30	1.04,	2.24	.000
Community Connectedness	0.72	0.27	0.19,	1.25	.008
Victimization*Family Connectedness	-.0.04	0.26	-0.55,	0.47	.872
Victimization*School Connectedness	0.53	0.26	0.02,	1.05	.043
Victimization*Community Connectedness	-0.39	0.25	-0.88,	0.09	.118
Depression					
Intercept	20.77	0.91	18.97,	22.57	.000
Sex	0.71	0.95	-1.18,	2.59	.460
Intervention	1.70	0.79	0.13,	3.26	.034
Victimization	1.05	0.27	0.53,	1.58	.000
Family Connectedness	-2.63	0.37	-3.35,	-1.91	.000
School Connectedness	-1.66	0.33	-2.31,	-0.99	.000
Community Connectedness	-0.41	0.30	-0.99,	0.17	.167
Victimization*Family Connectedness	0.15	0.29	-0.41,	0.71	.591
Victimization*School Connectedness	-0.34	0.29	-0.91,	0.24	.249
Victimization*Community Connectedness	0.30	0.27	-0.24,	0.84	.280
Suicidal Ideation					
Intercept	9.76	2.09	5.64,	13.88	.000
Sex	3.08	2.18	-1.22,	7.39	.159
Intervention	0.04	1.80	-3.51,	3.59	.981
Victimization	3.54	0.67	2.24,	4.86	.000
Family Connectedness	-3.65	0.88	-5.40,	-1.92	.000
School Connectedness	-2.03	0.82	-3.64,	-0.42	.013
Community Connectedness	-1.75	0.73	-3.19,	-0.31	.017
Victimization*Family Connectedness	-0.38	0.71	-1.79,	1.02	.587
Victimization*School Connectedness	-1.53	0.73	-2.96,	-0.09	.037
Victimization*Community Connectedness	-0.66	0.68	-1.99,	0.67	.328

Table 2.5. *Linear mixed models examining the interactions between electronic victimization and connectedness subtypes (family, school, community) as related to self-esteem, depression, and suicidal ideation*

	Estimate	SE	95% CI		p
Self-Esteem					
Intercept	19.11	0.88	17.38,	20.84	.000
Sex	0.10	0.89	-1.66,	1.86	.910
Intervention	0.46	0.74	-0.99,	1.92	.530
Electronic Victimization	-0.31	0.56	-1.41,	0.79	.580
Family Connectedness	2.55	0.45	1.66,	3.42	.000
School Connectedness	1.31	0.44	0.43,	2.19	.003
Community Connectedness	0.81	0.37	0.09,	1.54	.029
Electronic Victimization*Family Connectedness	-0.50	0.59	-1.66,	0.66	.393
Electronic Victimization*School Connectedness	1.12	0.57	-0.01,	2.24	.053
Electronic Victimization*Community Connectedness	-0.21	0.53	-1.26,	0.84	.694
Depression					
Intercept	20.81	0.96	18.92,	22.71	.000
Sex	0.25	0.97	-1.67,	2.17	.798
Intervention	1.72	0.81	0.13,	3.31	.035
Electronic Victimization	0.79	0.61	-0.41,	1.99	.197
Family Connectedness	-2.75	0.49	-3.71,	-1.79	.000
School Connectedness	-1.55	0.49	-2.51,	-0.60	.002
Community Connectedness	-0.31	0.40	-1.10,	0.49	.452
Electronic Victimization*Family Connectedness	0.20	0.65	-1.07,	1.47	.761
Electronic Victimization*School Connectedness	-0.62	0.63	-1.86,	0.62	.323
Electronic Victimization*Community Connectedness	-0.16	0.59	-1.31,	0.99	.790
Suicidal Ideation					
Intercept	8.63	2.21	4.27,	12.99	.000
Sex	2.21	2.22	-2.17,	6.60	.320
Intervention	0.34	1.83	-3.27,	3.95	.851
Electronic Victimization	3.79	1.53	0.79,	6.79	.013
Family Connectedness	-3.36	1.21	-5.73,	-1.00	.005
School Connectedness	-0.76	1.20	-3.12,	1.61	.527
Community Connectedness	-1.54	1.01	-3.54,	0.45	.129
Electronic Victimization*Family Connectedness	-1.13	1.61	-4.30,	2.03	.482
Electronic Victimization*School Connectedness	-3.48	1.59	-6.60,	-0.36	.029
Electronic Victimization*Community Connectedness	0.09	1.48	-2.83,	3.00	.953

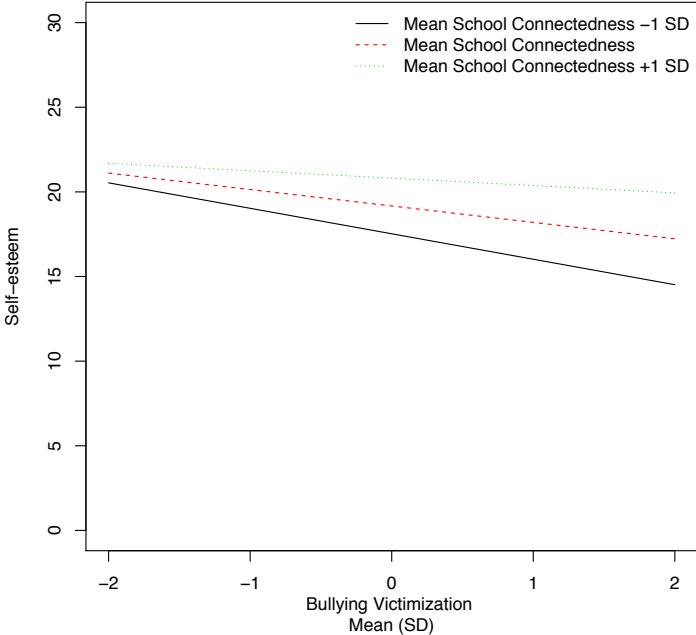Figure 2.1. *Interaction between victimization and school connectedness as related to self-esteem*

Figure 2.2. *Interaction between victimization and school connectedness as related to suicidal ideation*
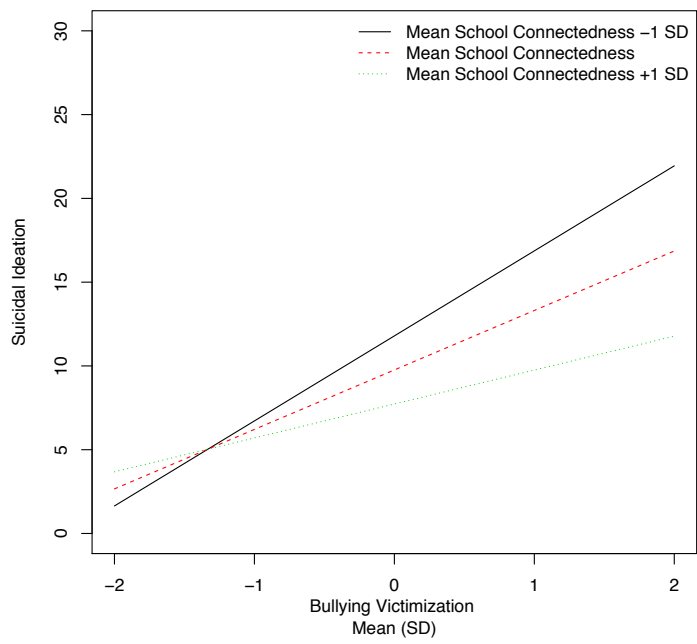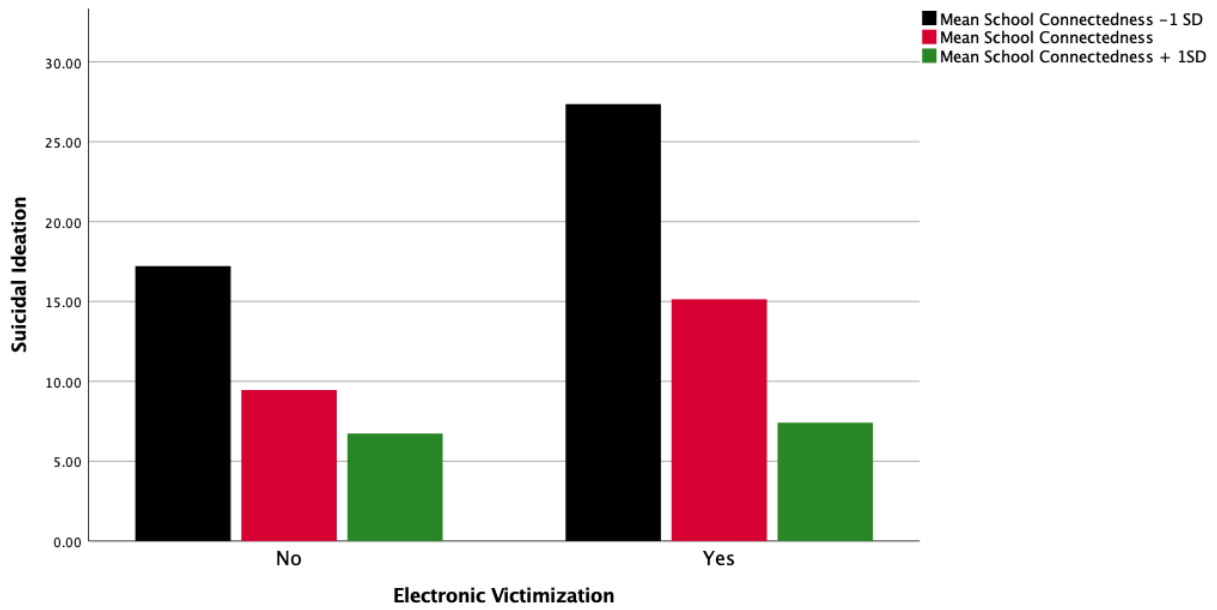
Figure 2.3. *Interaction between electronic victimization and school connectedness as related to suicidal ideation*

CHAPTER III

Interpersonal Conflict and Social Connectedness among Adolescents with a Recent Suicide Attempt (Study 2)

As the second leading cause of death among youth, suicide is a pressing public health concern (Centers for Disease Control and Prevention, 2016). Thus, it is important to understand what places an individual at increased risk for engaging in suicidal behavior. In an attempt to decrease the suicide rate, research has focused on identifying suicide risk factors. Empirically supported risk factors include demographic characteristics, psychopathology, interpersonal conflict, low social connectedness, suicidal ideation, and prior suicide attempts and behaviors (Gould et al., 2003; Kessler et al., 1999; McLoughlin et al., 2015; Nock et al., 2008). Risk factors can be conceptualized as proximal or distal. Proximal risk factors (also referred to as near-term risk factors or warning signs) occur in the days or hours prior to a suicide attempt and are specific to an individual's state (Rudd et al., 2006), while distal risk factors are temporally distant and occur in the months and years prior to a suicide attempt. Thus far, research has focused primarily on distal factors, particularly when considering youth and adolescent populations. This research has given clinicians and researchers an improved sense of who is at increased risk for suicide. However, the dearth of research focusing on near-term predictors has led to uncertainty regarding when an individual is at heightened acute risk.

An enhanced understanding of proximal suicide risk factors is necessary and could result in an improved conceptualization of when an individual is at imminent risk of making a suicide attempt. To this end, an expert panel convened in 2006 to generate a comprehensive list of suicide warning signs (Rudd et al., 2006). Notably, experts highlighted the lack of empirically supported warning signs; however, they reached consensus on a list of candidate warning signs with the goal of informing future research and clinical practice. Candidate warning signs included dramatic changes in mood (e.g., rage, anger, anxiety, agitation), changes in behaviors (e.g., increased substance use, engagement in risky activities, recklessness), changes in cognition

(e.g., feeling trapped, hopelessness), and suicide-related expressions (e.g., threats of suicide, suicidal behaviors, discussions of death or dying). Additionally, the Substance Abuse and Mental Health Service Administration (SAMHSA) brought together suicide prevention organizations and experts in the field to develop a list of suicide warning signs specific to adolescents that aligned with the available evidence base (National Action Alliance for Suicide Prevention, 2014). Warning signs included discussing suicide or making a plan, hopelessness regarding the future, severe/overwhelming emotional pain, and marked changes in behavior (e.g., withdrawal, sleep changes, anger, agitation/irritability). However, to date, the research on these candidate warning signs has been sparse, especially among adolescents.

Proximal Suicide Risk Factors

Only a handful of studies have examined proximal suicide risk factors and most have done so in adult samples. Among a sample of adults recruited following a suicide attempt, authors found that acute alcohol use and negative life events were unique predictors of next-hour suicidal ideation prior to a suicide attempt (Bagge, Littlefield, Conner, Schumacher, & Lee, 2014). Results imply that both acute alcohol use and negative life events (interpersonal and non-interpersonal) increase the escalation of suicidal ideation in the hours prior to a suicide attempt, a critical window for intervention efforts. Moreover, a study closely examining the 24 hours prior to a psychiatric hospitalization found that alcohol and drug use distinguished individuals hospitalized for suicide attempts when compared to those hospitalized for suicide ideation (Chiles, Strosahl, Cowden, Graham, & Linehan, 1986). This knowledge may have significant implications for suicide risk assessment and clinical decision making as it highlights the importance of incorporating information on acute substance use and negative life events in the conceptualization of risk.

Interpersonal Conflict as an Important Proximal Suicide Risk Factor

Several studies converge to emphasize the importance of interpersonal conflict in the time before a suicide attempt. A study that examined type, severity, and timing of stressful life events, using a matched case-control design among adults receiving residential substance use treatment, demonstrated that severe interpersonal stressful life events in the previous 30 days significantly increased the risk for a suicide attempt (Conner et al., 2012). Within an adult sample, Bagge and colleagues (2013) utilized a case-crossover design to examine the occurrence

of negative life events in the 48 hours prior to a suicide attempt. Findings indicate that an adverse life event, especially of an interpersonal nature, increases the odds of making a suicide attempt. Notably, negative life events were only suicide attempt triggers among adults not currently planning to attempt suicide. Negative life events related to love/marriage and crime/legal matters were predictive of a suicide attempt in the two subsequent months among a sample of adults with a personality disorder diagnosis (Yen et al., 2005), after controlling for a range of suicide risk factors. Recent (in the three weeks prior) interpersonal and forensic life events (e.g., arrest, sentencing) differentiated youth and young adults (age 13 to 34) who died of suicide from case-matched controls (Cooper, Appleby, & Amos, 2002). Taken together, the significance of considering interpersonal conflict and life events in the weeks and hours prior to a suicide attempt has been highlighted among adult samples. Negative interpersonal life events, including interpersonal conflict and low social connectedness, are also substantiated distal suicide risk factors (Castellví et al., 2017; King & Merchant, 2008).

Research on proximal risk factors for suicide attempts among youth also points to the importance of interpersonal conflict in the conceptualization of suicide risk. In a sample of 78 Korean adolescents with a suicide attempt history, the most frequently reported near-term factors for a suicide attempt, per reviewing psychiatrist, included bullying victimization or social exclusion (28.2%) and parent-child relationship problems (28.2%) (Park et al., 2015), followed by psychotic symptoms (20.5%) and depression (15.4%). Similarly, among a large sample of Norwegian adolescents, interpersonal conflicts were the most commonly identified proximal risk factors for suicide re-attempts (Dieserud, Gerhardsen, Van den Weghe, & Corbett, 2010), followed by factors in an unspecified category (e.g., a trigger not listed or naming multiple triggers). Beautrais, Joyce, and Mulder (1997) examined near-term factors and recent life events for suicide attempts among youth and young adults, ages 13 through 24. Results indicated that relationship break-ups and other interpersonal problems are the most common proximal risk factors, followed by economic challenges, criminal involvement, and academic/job difficulties. Moreover, the most common life events in the year prior to a suicide attempt included interpersonal difficulties, work/economic difficulties, crime, and health-related problems. Given that the adolescent years are marked by changes in the importance of social relations and increased interpersonal conflict (Brown & Larson, 2009; Buhrmester, 1998; Furman &

Buhrmester, 1992), the potent precipitating role that these difficulties can play for adolescents prior to a suicide attempt is unsurprising. As such, continued efforts to understand proximal interpersonal risk characteristics are warranted.

Study Purpose

The purpose of this study is to address important gaps in the extant research by examining the role of interpersonal factors in the hours prior to a suicide attempt. As compared to research on distal risk factors, the research examining proximal risk factors is sparse, particularly when considering adolescents. There have been several calls to address this, specifically to improve the short-term prediction of suicidal behaviors and attempts (Glenn & Nock, 2014; Miranda & Shaffer, 2013; National Action Alliance for Suicide Prevention, 2014). Moreover, a primary objective of the *2012 National Strategy for Suicide Prevention: Goals and Objectives for Action: A Report of the US Surgeon General* is to "Increase knowledge of the warning signs for suicide and of how to connect individuals in crisis with assistance and care" (Office of the Surgeon General, 2012). This goal is in line with a stated aspirational goal of the *National Action Alliance for Suicide Prevention's (Action Alliance) Research Prioritization Task Force,* which is to "Find ways to assess who is at risk for attempting suicide in the immediate future" (Claassen et al., 2014).

The significance of identifying warning signs for suicide attempts is clear when considering implications for health care providers, as well as adults that interact with adolescents (e.g., parents, teachers). An improved sense of whether a patient is safe for discharge, safe in the next hours, or safe for the upcoming days can impact clinical decision making. An improved conceptualization of short-term risk can also aid in the development of interventions that target malleable proximal risk factors with the objective of decreasing subsequent suicidal behaviors or attempts. Empirically supported warning signs may not only aid in clinical decision making and intervention development but are important for families and communities in the context of broader suicide prevention efforts. By identifying observable warning signs, parents may experience more confidence to monitor quantifiable factors and engage in direct suicide prevention efforts. The current study narrows in on interpersonal factors as suicide warning signs. However, the broader pilot study, from which data for the current study was attained, examines a breadth of suicide attempt warning signs (e.g., substance use, sleep disturbances,

suicidal preparatory behaviors). Given that the focus of this dissertation is on interpersonal factors that impact suicide risk both distally and proximately, these factors will be examined in depth in the current study. However, findings will be discussed in the context of other suicide warning signs.

With primary consideration of interpersonal factors, the current study addresses several gaps in the extant literature including the paucity of research examining near-term predictors of suicide attempts among adolescent samples. Additionally, it is important to describe how adolescent's general experiences (i.e., experiences in previous weeks and months) relate to their experiences immediately prior to a suicide attempt, a gap in the current literature. An improved understanding of how experiences prior to a suicide attempt relate to adolescent's everyday experiences can potentially inform clinical care, crisis management, and future research efforts. In the current study, we are interested in examining how baseline characteristics relate to whether an individual reported an interpersonal suicide attempt warning sign or not. Specifically, some conceptual frameworks theorize that individuals may sensitize to stressful events, (Brådvik & Berglund, 2011; Pettit, Joiner Jr, & Rudd, 2004), in that in the face of repeated exposure to a stressor, a reaction is magnified in severity. Under this assumption, we would expect that repeated exposure to interpersonal stress may, at some point, trigger a magnified response, in this case, a suicide attempt. Alternatively, adolescents who do not experience chronic victimization or interpersonal conflict may be more likely to report these risk factors as warning signs, as an increase in victimization or interpersonal conflict may represent a change that could trigger suicidal behavior. By examining how baseline characteristics relate to near-term suicide attempt risk factors, we may start to answer questions such as "Are individuals who experience persistent interpersonal distress more likely to report an interpersonal factor as a suicide attempt warning sign?" Moreover, given that a warning sign is defined as a "*detectable* sign that indicates heightened risk for suicide in the near-term (i.e., within minutes, hours, or days)" (Rudd et al., 2006), it is important to not only assess self-reported perceptions of warning signs, but also to attain information from other relevant sources (e.g., parents). This case-crossover design study has two aims with the goal of addressing these gaps:

1. Examine whether interpersonal conflict (negative romantic event, serious conflict with a parent, and/or negative relationship event with someone else), bullying

involvement (victimization and perpetration), and social withdrawal are warning signs of suicide attempts within a sample of adolescents seeking emergency services. Given previous research indicating that interpersonal negative life events are among the most frequently reported precipitants of suicide attempts and deaths by suicide, we expect that adolescents and parents will report interpersonal conflict, bullying involvement, and social withdrawal more frequently in the 24 hours prior to a suicide attempt than in a comparison 24-hour period.

2. Explore how baseline clinical and interpersonal characteristics (e.g., depression/anxiety symptoms, history of bullying involvement, interpersonal aggression, family connectedness) are related to interpersonal warning signs (interpersonal conflict, social withdrawal, victimization). Specifically, we will evaluate what baseline characteristics differentiate adolescents who report an interpersonal suicide attempt warning sign from those who do not report an interpersonal suicide attempt warning sign.

Method

Participants

Youth (N = 32), ages 12 to 17 (M = 15.15, SD = 1.41), and their parents were recruited from Psychiatric Emergency Services (PES), or Children's Emergency Services (CES) at a university hospital in the midwestern region of the United States. Youth were primarily female (n = 24; 75%) and self-identified race is as follows; 75% Caucasian (n = 24), 9.4% Asian (n = 3), 6.3% Black/African American (n = 2), and 3.1% multiracial (n = 1). Approximately, 16% of youth identified as Hispanic/Latino. We did not know the race/ethnicity of 6.3% of youth (n = 2). Demographic data were attained through a self-report questionnaire for 53.1% of youth (n = 17) and a medical record review for 46.9% of youth (n =15). An additional study inclusion criterion was youth report of a suicide attempt in the previous two weeks. Exclusion criteria included being medically unstable, presenting with severe cognitive impairment, not being able to consent or complete the assessment in English, and not having a parent/guardian present.

Procedures

Youth presenting to PES or CES in the indicated age range (12-17) were pre-screened by study staff. During the pre-screening phase, medical chart, C-SSRS interview data (hospital staff

administered), and/or information from hospital staff was reviewed to determine whether a suicide attempt had occurred in the previous two weeks. Youth were approached after the initial nursing assessment (CES) or social work assessment (PES) was completed. Before approaching families, study staff consulted with hospital staff to assure that the family was appropriate for study enrollment based on clinical interview and presenting concerns. Following consent/assent procedures, research staff administered self-report measures to youth.

All Warning Signs Interviews (described in the measures section below) were completed by licensed Master or Ph.D. level clinicians. Interviews were completed in person (15 adolescent interviews and 11 parent interviews) and via telephone (16 adolescent interviews, 21 parent interviews). For interviews completed in PES or CES, interviewers secured a private room (patient or interview room) and completed the youth interview followed by the parent interview. Youth's medical care was prioritized such that interviews were occasionally interrupted for the delivery of care. Interviews not completed in PES or CES were conducted by phone within two weeks of study recruitment. Youth interviews required approximately 30-50 minutes for completion and interviews with parents required approximately 15-30 minutes for completion. For the first twelve study participants, compensation included dollar store gift items for youth (2 gifts) and parents (1 gift). Following an Institutional Review Board amendment, youth and parents were each compensated with $25 Amazon gift cards. All study protocols and procedures were approved by the University of Michigan's Institutional Review Board.

Measures

Suicidal ideation and attempts were measured using a self-report version of the *Columbia-Suicide Severity Rating Scale* (C-SSRS; Posner et al., 2011). The C-SSRS was used to assess lifetime history of suicide attempts. The following questions were used, "Have you ever in your life made a suicide attempt?" and "If yes, how many times in your life?" The C-SSRS is a widely used measure of suicidal thoughts and behaviors (Posner et al., 2011) and has demonstrated predictive validity for subsequent suicide attempts (Gipson et al., 2015; Horwitz et al., 2015).

Non-Suicidal Self-Injury (NSSI) was assessed using items from the *Youth Risk Behavior Survey (YRBS)* (Centers for Disease Control and Prevention, 2012) and the *Functional Assessment of Self-Mutilation (FASM)* (Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007).

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One item from the *YRBS* was used to assess the frequency of NSSI; "During the past 12 months, how many times did you do something to purposely hurt yourself without wanting to die, such as cutting or burning yourself on purpose?" One item from the *FASM* was used to assess frequency of NSSI in the past week; "In the past week, have you harmed or hurt your body on purpose, such as cutting or burning your skin, or hitting yourself, without wanting to die?" Items were coded dichotomously (yes/no) if the youth endorsed any engagement in NSSI during the defined time periods.

Depression and anxiety symptoms in the previous two weeks were assessed using the 4-item *Patient Health Questionnaire (PHQ-4)* (Löwe et al., 2010). Youth responded using a 4-point Likert scale ranging from "*not at all*" to "*nearly every day.*" Sample questions include "Feeling nervous, anxious, or on edge other than just here in the emergency department" and "Feeling down, depressed, or hopeless." The PHQ-4 has demonstrated strong construct validity (Kroenke, Spitzer, Williams, & Löwe, 2009; Löwe et al., 2010) and strong internal consistency in previously studied samples ($\alpha = 0.82$) (Löwe et al., 2010). Due to previous reports that indicate an over endorsement of anxiety while in the ED (Fein, 2013), the first item in this measure was edited to note that anxiety is being measured "other than just here in the ED." The Cronbach's alpha in this sample for the PHQ-4 was .74.

Bullying victimization was assessed using two items from the *World Health Organization's Health Behavior Survey* (Klomek et al., 2007; Klomek, Marrocco, Kleinman, Schonfeld, & Gould, 2008; Nansel et al., 2001). The prompt for these questions includes a definition for bullying victimization that describes the chronic and intentional nature of bullying victimization; "Here are some questions about bullying. We say a student is being bullied when another student, or a group of students, say or do nasty and unpleasant things to him or her. It is also bullying when a student is teased repeatedly in a way he or she does not like. But it is not bullying when two students of about the same strength quarrel or fight." Youth were then asked if they were victimized in and out of school. Youth responded using a 4-point Likert scale ranging from "*I haven't been bullied*" to "*several times a week.*" Responses were collapsed into a single dichotomous variable indicating any bullying victimization experiences. Cronbach's alpha in this sample for the two bullying victimization items was .68.

Family connectedness was measured using two items from the *Parent-Family Connectedness Scale* (Ford et al., 2005; Ream & Savin-Williams, 2005; Williams & Chapman, 2012). A sample item is "How much do people in your family understand you?" Youth responded using a 5-point Likert scale ranging from "*not at all*" to "*very much.*" This measure was adapted from the ADD Health survey and has demonstrated strong internal consistency (α = .87) (Williams & Chapman, 2012). The Cronbach's alpha in this sample was .79.

Interpersonal aggression was measured using one item from the Y*outh Risk Behavior Survey (YRBS)* (Centers for Disease Control and Prevention, 2012) and one item from the *Impulsive Aggression Quick Screen (IA-QS)* (Stanford, Greve, & Dickens, 1995). YRBS items are widely used measures of aggressive and delinquent behavior (Eaton, Davis, Barrios, Brener, & Noonan, 2007; Martins & Alexandre, 2009; Peleg-Oren, Saint-Jean, Cardenas, Tammara, & Pierre, 2009; Rutman, Park, Castor, Taualii, & Forquera, 2008) and have demonstrated strong reliability (Brener et al., 2002; Zullig, Pun, Patton, & Ubbes, 2006). The item used from the *YRBS* was: "During the past 12 months, how many times were you in a physical fight on school property?" The item used from the *IA-QS* was "Over the past 6 months, have you had times when you became angry and enraged with others in a way that was out-of-control or inappropriate?"

Alcohol use was measured with the *Alcohol Use Disorders Identification Test-Consumption (AUDIT-C)* (Saunders et al., 1993). This 3-item measure has been shown to demonstrate strong internal consistency and has been validated for use in EDs with youth (Chung et al., 2002). Due to low alcohol use endorsement, items were re-coded dichotomously (yes/no) if the youth replied "yes" to any of the three items. We used the *Drug Use Scale (DUS)* to measure illicit substance use in the previous two weeks (National Institute for Drug Abuse, 2013). We assessed for: painkiller, stimulant, sedative/tranquilizer, steroid, other medication, marijuana, cocaine/crack, club drug (e.g., ecstasy), hallucinogen, heroin, inhalant, and methamphetamine use. Due to low substance use endorsement per category, items were re-coded dichotomously (yes/no) if the youth replied "yes" to any drug use items.

Suicide attempt warning signs were assessed using the adolescent and parents version of the *Warning Signs Interview for Suicide Attempts – Adolescent (WSSA-A), a* structured interview-style assessment based on the *Warning Signs for Suicide Self-Report – Adult (WSSA-*

Adult) ([Simons, Bagge, & Conner, 2016](#)*)*. The *WSSA-A,* developed by Drs. Cheryl King and Courtney Bagge, is an adaptation of the *WSSA-Adult*. The *WSSA-Adult* is a shortened version of the *Time Follow-Back for Suicide Attempts Interview* ([Bagge & Borges, 2017](#); [Bagge, Glenn, & Lee, 2013](#); [Bagge, Lee, et al., 2013](#)) that has been used in various studies to recreate the 48 hours prior to a suicide attempt. The WSSA-Adolescent includes a broad array of possible cognitive, affective, behavioral, and event-related warning signs for adolescent suicide attempts, selected with careful consideration of adolescent development. The *WSSA-A* administered to parents includes behavioral and event-related items. The interview begins by identifying the exact date and time of the suicide attempt with the adolescent. After establishing a date and time for the suicide attempt, the timeframe of interest (the 24 hours prior to the suicide attempt; e.g., Monday 6:00 am to Tuesday 6:00 am) is defined. A range of warning signs are then assessed within the identified timeframe (e.g., suicide planning, emotional distress, alcohol/drug use, aggressive behavior, impulse control difficulties, agitation, sleep disturbances, negative interpersonal life events). The 49-item interview is divided into three sections assessing behaviors, cognitions, and emotions. Sample behavioral items of interest include I "[withdrew] from people or usual activities," "experienced bullying by a peer," "hurt someone physically or emotionally," "[had] a serious conflict or [got] into trouble with your parents," "[had] a negative relationship event such as a break-up, separation, falling out, or serious disruptive argument with a girlfriend or boyfriend (or someone you were romantically interested in)," and "[had] a negative relationship event such as a separation, falling out, or serious disruptive argument with someone else." Response options for behavioral questions were "*yes*" and "*no.*" Youth were also asked a range of questions related to thoughts and emotions. Sample items include "I thought I did not belong," "I felt ashamed," and "I felt close to people at my school." Youth were asked to respond using a 5-point scale ranging from "*not at all*" to "*extremely.*"

Following the assessment of the 24 hours prior to the suicide attempt, a control window during which a suicide attempt did not occur is identified (typically the 24 hours prior to the 24-hours preceding the suicide attempt; e.g., Sunday 6:00 am – Monday 6:00 am). The same questions assessing behaviors, thoughts, and emotions are repeated for this timeframe. Procedures for the *WSSA-A* administered to parents differ in that parents are provided with the exact date and time of the suicide attempt. Again, the two timeframes are identified (24 hours

before the attempt, and a control 24 hours (typically the day prior to the day of the suicide attempt)). Parents are asked the same items about adolescent behaviors, and not questions about thoughts and emotions.

Study Design and Data Analysis Plan

The first aim was to examine whether interpersonal conflict, social withdrawal, and victimization are suicide attempt warning signs. A case-crossover design was used to evaluate whether these factors are reported more frequently in the 24 hours prior to a suicide attempt (case) compared to a 24-hour period where a suicide attempt did not occur (control). This design has been implemented previously in studies of suicide attempt warning signs (see Bagge & Borges, 2017; Bagge, Lee, et al., 2013) and allowed us to examine within-individual differences as potential near-term predictors of suicide attempts.

Descriptive statistics were calculated for primary study variables. To examine the relationship between interpersonal conflict, social withdrawal, victimization, and the likelihood of making a suicide attempt, we first used McNemar's chi-square tests. This approach allowed us to examine univariate differences between case and control days while accounting for the dependent nature of the data. To examine a multivariate model with a binary outcome (case vs. control), we utilized a conditional logistic regression approach. This approach accounts for the analysis of matched data (within-in person 24-hour windows) in the examination of a binary outcome (presence of a suicide attempt in a specific 24-hour time window). To examine the relationship between continuous ratings of cognitions and emotions, and the likelihood of making a suicide attempt, we first used paired-sample *t*-tests. This approach allowed us to examine univariate differences in ratings of cognitions and emotions between the case and the control days while accounting for the depended nature of the data. To examine a multivariate model with a binary outcome (case vs. control), we also utilized a conditional logistic regression approach.

The second study aim was to explore how baseline clinical and interpersonal characteristics were related to whether or not an interpersonal factor (interpersonal conflict, social withdrawal, and victimization) was a suicide attempt warning sign. Baseline characteristics included depression symptoms, anxiety symptoms, history of bullying involvement, interpersonal aggression, and family connectedness. To explore this aim, we

examined whether or not these characteristics were associated with an interpersonal factor being a suicide attempt warning sign (e.g., "Were higher levels of family connectedness associated with whether social withdrawal was a suicide attempt warning sign?"). We used chi-square tests and t-tests, as appropriate, for dichotomous and continuous variables to examine differences in baseline characteristics for youth who reported interpersonal factors as warning signs as compared to youth who did not. Three new interpersonal event variables were created to indicate if that interpersonal event (interpersonal conflict, bullying involvement, social withdrawal) was a suicide attempt warning sign for a specific youth. Then we examined whether baseline characteristics differed between youth who reported each specific interpersonal event as a warning sign as compared to those who did not.

Results

Descriptive Statistics

Clinical Characteristics. Means, standard deviations, counts and percentages describing adolescent clinical characteristics (suicide attempt history, NSSI history, current symptoms of depression and anxiety) are displayed in Table 3.1. A high proportion of adolescents reported a history of multiple suicide attempts (17 of 32 [53.1%]). The majority of adolescents reported engaging in NSSI within the past year (28 of 32 [87.5%]), with 10 of 32 (31.3%) adolescents reporting that they engaged in NSSI more than three times in the past week. Approximately half (15 of 32 [47%]) and a quarter (8 of 32 [25%]) of adolescents reported substance use and/or alcohol use, respectively. Most frequently, adolescents reported engaging in marijuana use (9 of 32 [28.1%]) in the previous two weeks.

Interpersonal Factors. Interpersonal baseline characteristics are also reported in Table 3.1. Self-reports indicated that 20 of 32 youth (62.5%) had experiences with bullying victimization during the current semester. In the 24 hours prior to the index suicide attempt, 58.1% (18 of 31) of adolescents reported interpersonal conflict, 29 % (9 of 31) reported bullying involvement, and 77.5% (24 of 31) reported social withdrawal. In the 24 hours prior to the index suicide attempt, 46.9% (15 of 32) parents reported adolescent interpersonal conflict, 31.3% (10 of 32) reported adolescent bullying involvement, and 62.5% (20 of 32) reported adolescent social withdrawal.

Primary Study Aim: Interpersonal Factors as Suicide Attempt Warning Signs

Interpersonal Behaviors as Suicide Attempt Warning Signs – Adolescent Report.
Table 3.2 displays McNemar's chi-square analyses examining differences in interpersonal behaviors between case and control days as reported by adolescents and parents. As reported by adolescents, interpersonal conflict (negative romantic event, conflict with parents and/or negative relationship event with others) was associated with an increased likelihood of making a suicide attempt ($p < .05$). When examined individually, both a serious conflict with parents ($p < .05$) and a negative relationship event with another person ($p < .05$) were associated with an increased likelihood of making a suicide attempt. Experiences of social withdrawal were also associated with an increased likelihood of making a suicide attempt ($p < .05$). Bullying involvement (victimization and/or perpetration) was not associated with an increased likelihood of making a suicide attempt ($p > .05$).

When examined at a multivariate level using a conditional logistic regression approach (displayed in Table 3.3), adolescent reported interpersonal conflict (a composite of negative romantic event, conflict with parents and/or negative relationship event with others) remained associated with an increased likelihood of making a suicide attempt ($OR = 0.08$, 95% confidence interval [0.01, 0.87], $p < .05$). However, bullying involvement and social withdrawal did not remain significantly associated with making a suicide attempt ($p > .05$).

Interpersonal conflict was a warning sign (occurring in the 24 hours prior to the attempt but not in the comparison period) for 14 of 31 (45%.2%) adolescents. Eight of 31 (25.8%) adolescents reported social withdrawal as a warning sign, while 5 of 31 (16.1%) reported bullying involvement as a warning sign.

**Interpersonal Cognitions and Emotions as Suicide Attempt Warning Signs –
Adolescent Report.** The cognition of not belonging was associated with an increased likelihood of making a suicide attempt ($t (30) = 2.53$, $p < .05$). Cognitions such as thoughts that others would be better off without you, thoughts that you are not as good as others, and angry/hostile thoughts about others were not associated with an increased likelihood of making a suicide attempt ($p > .05$). When examined at a multivariate level using a conditional logistic regression approach, adolescent reported cognitions were not associated with an increased likelihood of making a suicide attempt.

Emotions such as feeling anger or rage towards others ($t (30) = 2.79$, $p < .05$) and feeling

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ashamed (t (30) = 3.23, $p < .05$) were associated with an increased likelihood of making a suicide attempt. Emotions such as feeling alone, close to others at school, like you have friends whom you can trust and like you have family that understands you were not associated with a likelihood of making a suicide attempt ($p > .05$). When examined at a multivariate level using a conditional logistic regression approach, adolescent reported feelings of anger or rage towards others remained significantly associated with making a suicide attempt ($OR = 0.06$, 95% confidence interval [0.01, 0.79], $p < .05$). However, feeling ashamed did not remain significantly associated with making a suicide attempt ($p > .05$).

Interpersonal Behaviors as Suicide Attempt Warning Signs – Parent Report. As reported by parents and displayed in Table 3.2, interpersonal conflict (negative romantic event, conflict with parents and/or negative relationship event with others) was associated with an increased likelihood of making a suicide attempt ($p < .05$). However, when looked at individually, negative romantic event, conflict with parents, and negative relationship event with others were not associated with an increased likelihood of making a suicide attempt ($p > .05$). Bullying involvement (victimization and/or perpetration) was significantly associated with an increased likelihood of making a suicide attempt ($p < .05$) Experiences of social withdrawal were also associated with an increased likelihood of making a suicide attempt ($p < .05$).

Interpersonal conflict was an adolescent suicide attempt warning sign as reported by 9 of 32 (28.1%) parents. Social withdrawal was a suicide attempt warning sign as reported by 6 of 32 (18.8%) parents. Similarly, bullying involvement was a suicide attempt warning sign as reported by 6 of 32 (18.8%) parents.

Due to the small sample size and distribution of responses in the parent data, we were unable to fit a multivariate model.

Other Suicide Attempt Warning Signs – Adolescent and Parent Report. In addition to interpersonal warning signs, the pilot study also examined a range of other candidate warning signs including substance use, risky behaviors, negative life events, sleep problems, and suicide-related behaviors. Though they are not a primary aim of this dissertation, it is important to understand these findings to comprehend risk comprehensively. Per adolescent report, suicide-related behaviors, specifically acting to prevent others from stopping the attempt, were significant suicide attempt warning signs ($p > .05$). Per adolescent report, significant cognitions

and emotions included hopelessness, suicidal thoughts, suicidal ideation rumination, feeling trapped, feeling emotional turmoil, feeling sad, down or depressed, and feeling agitated ($p > .05$). Per parent report, suicide-related behaviors, specifically telling someone that they were going to make an attempt, were significant suicide attempt warning signs ($p > .05$).

Exploratory Analyses

Exploratory analyses did not reveal differences in clinical and interpersonal baseline characteristics between adolescents and parents who reported an interpersonal event as a warning sign as compared to those who did not ($p > .05$). However, these exploratory analyses were significantly limited by a small sample size that likely impacted our ability to detect differences.

<div align="center">

Discussion

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Results from the present study indicate that interpersonal factors are significantly more common in the 24 hours prior to a suicide attempt than in a comparison 24-hour period. Given previous findings that interpersonal negative life events are proximal risk factors for suicide attempts (Dieserud et al., 2010; Park et al., 2015), and substantial research indicating a significant distal relationship between interpersonal factors and suicidal thoughts and behaviors (Castellví et al., 2017; King & Merchant, 2008), the current findings are in line with the previous literature. Findings also align with theories that converge in highlighting the importance of relational aspects when conceptualizing suicide risk (Durkheim, 1897; Joiner, 2009; Klonsky & May, 2015). As one of the first studies to use a case-crossover design to examine suicide attempt warning signs among adolescents, this research adds meaningfully to our understanding of near-term suicide risk.

Behaviors, Cognitions, and Emotions as Suicide Attempt Warnings Signs

At the univariate level, in our sample of adolescents seeking emergency services, both parents and adolescents reported that interpersonal factors were suicide attempt warning signs. Specifically, interpersonal conflict broadly (serious conflict with parents, negative relationship event with a significant other, and/or negative relationship event with another person) and social withdrawal were suicide attempt warning signs, per adolescent reports. At the multivariate mixed model level, interpersonal conflict was the only significant suicide attempt warning sign, per adolescent report. Additionally, adolescents reported that the thought of not belonging was related to an increased likelihood of making a suicide attempt, as were emotions such as anger

towards others and shame. Parents reported that interpersonal conflict broadly, social withdrawal and bullying involvement (bullying victimization and/or bullying perpetration) were suicide attempt warning signs at the univariate level. Though findings must be interpreted as preliminary and analyses were significantly limited by the small sample size, this study is a first step to better understand near-term risk.

Findings are consistent with the previous limited research on adolescent warning signs for suicide attempts, which has pointed to the importance of interpersonal near-term suicide risk factors. In close alignment with our results, Park and colleagues (2015) found that bullying victimization, social exclusion, and parent-child relationship problems were the most common near-term risk factors for a suicide attempt. Findings are also consistent with research showing that interpersonal conflicts were identified most commonly as a proximal re-attempt risk factor among adolescents (Dieserud et al., 2010). It may be that youth facing a range of predisposing and more static risk characteristics (e.g., history of depression, chronic stress), lack the emotional resources necessary to cope with interpersonal conflict and this distress may prompt the transition from thoughts to behaviors. It may also be that following the decision to make a suicide attempt, youth may tend to isolate as they contemplate next steps. It is evident that additional research is needed to understand the nature of suicide attempt warning signs and how the days, months, and years prior to a suicide attempt impact what warning signs are observed in the near-term.

Observable near-term risk factors can aid in refining multimethod conceptualizations of risk, and, perhaps, help identify those who deny frequently assessed risk factors such as suicidal ideation. Given that not all individuals disclose suicidal ideation, and that there is a discrepancy in responses depending on who is asking the questions and the way questions are asked, it is important to identify other observable risk factors that do not rely solely on an individual's report. To this end, Berman (2018) examined near-term suicide risk factors (30 days prior to death by suicide) among adults in the context of denied suicidal ideation. Findings suggest that interpersonal conflict and withdrawal, as well as suicidal ideation, suicide attempt, anxiety, agitation, sleep difficulties, financial stress, psychopathology, and family history of psychopathology, were important risk factors, even among individuals who denied suicidal ideation. Results highlight the importance of continuing to ascertain how to gather additional

data, in the form of observable behaviors, to strengthen risk conceptualizations and suicide prevention efforts, especially in the context of denied suicidal ideation.

Findings regarding cognitions and emotions (thoughts of not belonging, and feelings of shame and anger) in the 24 hours prior to a suicide attempt are also in line with the near-term risk behaviors found in the current study and previous research. For example, thoughts of not belonging are central to the interpersonal theory of suicide (Joiner, 2009) and have been shown to increase suicidal ideation (Stewart, Eaddy, Horton, Hughes, & Kennard, 2017). Shame may represent a reaction to other risk factors including bullying involvement. Shame appears to be an important component in the association between anxiety and feeling like a burden, which has, in turn, been linked to increased suicide risk (Arditte, Morabito, Shaw, & Timpano, 2016). Moreover, shame has been linked to concurrent and prospective suicidal ideation (Hastings, Northman, & Tangney, 2002; Lester, 1998). Anger towards others may be associated with interpersonal conflict, victimization, and social isolation. Trait anger has been linked to suicidal thoughts, and the interaction between emotion dysregulation and anger is associated with suicidal behaviors among undergraduate students (Ammerman, Kleiman, Uyeji, Knorr, & McCloskey, 2015). It will be important for further work to evaluate how cognitions and emotions relate to behaviors proximately prior to a suicide attempt.

It is essential to place the findings of the current study in the context of research that has demonstrated a distal relationship between interpersonal factors and suicide risk. Given the lack of clarity regarding how predisposing characteristics are related to proximal risk factors, it is important to delineate how interpersonal factors serve as near-term predictors and are associated with distal risk factors. To this end, our second study aim attempted to examine how baseline clinical and interpersonal characteristics are related to interpersonal warning signs. However, exploratory analyses did not reveal differences in clinical and interpersonal baseline characteristics between adolescents and parents who reported an interpersonal event as a warning sign and those who did not. Analyses were exploratory in nature and significantly restricted by the small sample size. Additionally, our baseline characteristics were limited to a brief survey. Future studies should comprehensively examine how predisposing characteristics are related to near-term risk factors. It may be that in alignment with a sensitization model (Pettit et al., 2004), adolescents who report interpersonal factors as warning signs may experience higher levels of

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interpersonal difficulties at the baseline level. Alternatively, it may be that adolescents who report interpersonal factors as warning signs may experience lower levels of interpersonal difficulties at baseline and, thus, an increase in interpersonal conflict may trigger suicidal behavior. It will be critical for subsequent research to attempt to define these relationships. Delineation of these associations would add meaningfully to our understanding of individual differences in adolescent suicide attempt warning signs. Moreover, it will be important for theories used to conceptualize suicide risk to further outline the differential impact of distal and proximal suicide risk factors, interpersonal and otherwise.

In the current study we identified clearly defined observable warning signs (e.g., having a serious disruptive argument, withdrawing) and symptoms (e.g., feeling agitated, feeling shame) that are distinct from distal risk factors. Though additional studies, with various samples and methodological approaches, are warranted to produce a list of empirically supported warning signs, the current study provides evidence that begins to support the importance of interpersonal factors. Though efforts have been made to convene experts and establish consensus regarding warning signs (National Action Alliance for Suicide Prevention, 2014; Rudd et al., 2006), previous studies have shown that there is significant variability and a general lack of consensus when examining how warning signs are disseminated, specifically on the internet (Mandrusiak et al., 2006). In their review of warning sign lists presented on websites, Mandrusiak and colleagues (2006) found that about half of warning signs were unique to each website. Moreover, warning signs are frequently poorly defined, vague (e.g., sudden behavioral change), or may represent distal suicide risk factors (e.g., history of depression) (Mandrusiak et al., 2006; Rudd et al., 2006). Thus, continued empirical research aimed at clearly defining and examining suicide attempt warning signs is critical.

Concordance of Parent and Adolescent Reports

Reports from parents and adolescents were relatively consistent and indicated the importance of both interpersonal conflict and social withdrawal in the near-term prediction of suicidal behavior. Given that parents play a central role in identifying adolescents who are likely in need of further evaluation or immediate supports, it is important to understand warning signs from their unique perspective. Concordance in what adolescents are experiencing and what parents are observing highlights the pervasiveness of these risk factors. A risk factor that is

identified by both adolescents and parents is likely a risk factor that can be objectively identified by other care providers, peers, or adults who interact with youth. Given that adolescents may struggle to share or independently identify and label internal states (e.g., feeling ashamed, agitation), observable behaviors evident enough to be captured by parents, are crucial to near-term risk detection.

It is also important to discuss differences in parent and adolescent reports given substantial literature that notes significant discrepancies in reports of psychopathology and conflict between parents and adolescents (De Los Reyes & Kazdin, 2005; Ehrlich, Richards, Lejuez, & Cassidy, 2016). For example, parents reported that bullying involvement significantly differed on the day of the suicide attempt. Despite substantial research indicating the strong link between victimization and suicide risk (Holt et al., 2015; Van Geel et al., 2014), bullying victimization was not a significant near-term indicator of a suicide attempt, per adolescent report. Though findings may be due to the small sample size, it may also be that adolescent's own experiences of victimization reflect a more chronic offense, thus not distinguishing the attempt day from a comparison period. Given the substantiated link between bullying involvement and suicidal thoughts and behaviors and publicized case examples citing victimization as a precipitant for self-harm, future research should more comprehensively examine bullying involvement as a near-term suicide attempt risk factor. For example, electronic victimization, as well as other subtypes of victimization (relational, overt) should be examined. Specifically, near-term victimization should be studied in the context of whether victimization has been occurring chronically to delineate how distal and proximal risk factors interrelate.

Interpersonal Suicide Attempt Warning Signs in the Context of Other Warning Signs

It is important to place the highlighted interpersonal factors discussed in the context of other suicide attempt warning signs. Specifically, suicide-related behaviors were suicide attempt warning signs, per adolescent and parent reports. Additionally, adolescents reported that cognitions and emotions such as hopelessness, suicidal thoughts, suicidal ideation rumination, feeling trapped, feeling emotional turmoil, feeling sad, down or depressed, and feeling agitated were suicide attempt warning signs. Taken together, warning signs align closely with those proposed by SAMHSA (National Action Alliance for Suicide Prevention, 2014). Proposed warning signs that were supported in our current study include discussing suicide or making a

plan, hopelessness, severe/overwhelming emotional pain, and marked changes in behavior, specifically withdrawal. Though this dissertation narrows in on the specific role of interpersonal factors, it is crucial that both clinical approaches and future research tackle the problem of suicide from various perspectives, using information from multiple informants, and considering a breadth of risk factors.

Implications

The primary goal of establishing empirically supported warning signs is to enrich education provided to the broader public regarding when an individual may be at heightened risk for making a suicide attempt. Enhanced awareness of near-term suicide attempt risk factors is likely to result in the detection of individuals at acute risk and, thus, timely linkage to appropriate interventions. Implications of the current work are primarily applicable to individuals without specific training in psychopathology or suicide risk assessment. Awareness of suicide attempt warning signs can be provided to individuals serving varied roles and may include primary care providers, hotline volunteers, law enforcement personnel, and community leaders, all individuals that interact with adolescents and who likely do not have specific training in suicide prevention. When considering adolescents specifically, information on warning signs should be disseminated to parents and in school settings to teachers, school staff, and students. By having a community that is well educated on what warning signs to be aware of and what to do when warning signs are detected, we can increase opportunities for intervention.

The sharing of information on warning signs can occur specifically in the context of clinical education facilitated by mental health providers to families with an adolescent who may be at increased risk due to a constellation of distal factors. Information on warning signs can be provided to caretakers as a set of guidelines for more effectively monitoring their child. Caretakers who are mindful of objective behaviors in their adolescents may increase their confidence in their ability to understand when an adolescent's suicide risk has intensified to the point where immediate action should be taken. This confidence may, in turn, increase opportunities for intervention. For instance, safety planning interventions are considered best practices when working with those at increased risk for suicide (Suicide Prevention Resource Center, 2008). Safety planning interventions are feasible, acceptable (Czyz, King, & Biermann, 2018), and there is some support for their effectiveness (Stanley et al., 2018). An important

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component of safety planning includes identifying individualized and specific triggers (cognitive, emotional, behavioral) that have been associated with suicidal ideation or self-harm in the past (Jobes, 2016; King et al., 2013). Empirically supported warning signs can also serve as an anchor for parents to encourage their child to engage coping skills, including those found in their safety plans. An understanding of proximal risk factors can guide parents to recognize when their child might require additional supervision or intervention. For example, supervision could be increased following serious disruptive arguments or when parents note a change in an adolescent's social withdrawal. Finally, parents can focus on cognitive and emotional warning signs when checking in with their adolescents. Tailored questions may provide a structure for parents when assessing risk independently and may also que parents as to when additional support is warranted.

Though data was attained from a pilot study and results are preliminary, findings could also have implications for clinical practice. Following the disclosure of suicidal ideation or history of self-harm, health care providers who work with adolescents (e.g., primary care providers, case managers, emergency medicine physicians) make critical decisions about next steps of care based upon a risk conceptualization. Care and follow up plans vary significantly from offering a referral list for mental health providers, creating a safety plan, restricting access to lethal means, increasing frequency of outpatient visits, referring families for a psychiatric assessment, to transferring the adolescent to a psychiatric inpatient facility. In current practice, these decisions are made based upon clinical judgment, perceptions of acute high-risk, and accessibility of services and supervision. Decisions about disposition and next steps in care need to be anchored on whether risk is acute and requires immediate intervention. Having a better sense of what characterizes the 24 hours prior to a suicide attempt could sharpen health care provider's ability to make such decisions, as near-term risk factors may be more relevant to clinical decisions than distal risk factors. Research on warning signs can also help guide clinicians as they work with adolescents and families to collaboratively identify triggers.

Empirical support for interpersonal warning signs highlights the importance of interventions that target aspects of interpersonal effectiveness and social support. It may be that interpersonal effectiveness tools and positive family relations are particularly helpful in the time directly prior to a suicide attempt. Interventions that have an impact on adolescents' suicidal

thoughts and behaviors have a focus on both improving family interactions and increasing non-familial support (Brent et al., 2013). Treatment approaches, which explicitly focus on improving interpersonal skills, such as Dialectical Behavioral Therapy, (Linehan, 2014; McCauley et al., 2018; Mehlum et al., 2014) or emphasize improvements in family communication and parental and social support (Esposito-Smythers, Spirito, Kahler, Hunt, & Monti, 2011; King et al., 2019) may be especially important as we move toward improving approaches that impact suicidal behaviors long term.

Limitations and Future Directions

Our findings should be considered in the context of several important limitations. Given the pilot nature of the present study, we are primarily limited by the small sample size. The sample size limited us from analyzing parent data in a multivariate manner and from examining potentially important differences by demographic subgroups. For example, future studies, with larger samples, should explore whether there are differences by important demographic characteristics, such as age and sex. Notably, our sample was primarily female, not permitting us to examine trends by sex. Additionally, the sample size limited our ability to examine how baseline characteristics relate to warning signs. Questions such as "For what youth are interpersonal warning signs more salient?", "How do baseline characteristics relate to the 24 hours prior to a suicide attempt?" or "Are warning signs different for an initial suicide attempt?" should be explored in future studies with larger sample sizes. Of note, ongoing research in this area is currently being conducted by King and colleagues, with support from the National Institute of Mental Health. That study utilizes a case-crossover design and the *WSSA-A* with the aim of better understanding 24-hour risk for a suicide attempt in a national cohort of adolescents.

Participants were recruited across two emergency departments. Though this recruitment approach allowed us access to a sample of adolescents with a suicide attempt history, these youth and families were seeking treatment. This approach limits our generalizability as there are adolescents who make lethal suicide attempts, make suicide attempts that they do not disclose or make suicide attempts that are unknown to adults surrounding them. There may be marked differences between these youth and the youth in our study. These differences could be associated with differences in warning signs for suicide attempts. Our sample was recruited at

one hospital in the midwestern region of the United States, limiting the generalizability of results.

A retrospective examination of suicide attempt warning signs could impact the accuracy of data, as we relied heavily on post-attempt recollections of the 48 hours prior to the attempt. Other methods should be considered including ecological momentary assessments of high-risk youth. Real-time assessment of suicidal ideation may be a feasible approach, which can give us insight into the nature of suicidal ideation and can aid in understanding short term change (Kleiman & Nock, 2018). A few studies have used ecological momentary assessment methodology to examine suicidal ideation and have noted that suicidal ideation, as well as its risk factors, including social support, vary significantly from one day to the next (Coppersmith, Kleiman, Glenn, Millner, & Nock, 2018; Czyz, Horwitz, Arango, & King, 2018; Kleiman et al., 2017). An improved understanding of day to day or even hour to hour changes can help us appreciate the dynamic nature of suicidal ideation and behavior, as well as, which factors predict near-term change.

Conclusions

This study makes a meaningful contribution to the literature on near-term predictors of adolescent suicide attempts. Results generally indicate that interpersonal conflict and social withdrawal, as well as interpersonal cognitions and emotions, significantly increase the likelihood of making a suicide attempt. As outlined, results require replication but provide a promising start as we begin to establish empirically supported suicide attempt warning signs. This effort will have significant implications, especially as we refine our abilities to identify which adolescents are at acute suicide risk and require immediate help.

Table 3.1. *Baseline clinical characteristics and interpersonal factors (N = 32)*

	M	SD	Min	Max
PHQ-4 total	8.66	2.78	2	12
Anxiety	4.31	1.67	1	6
Depression	4.34	1.56	1	6
Family connectedness	3.93	2.02	1	8
	N	%		
History of multiple suicide attempts	17	53.1	---	---
Non-suicidal self-injury in past year	28	87.5	---	---
Substance use	15	47.0	---	---
Alcohol use	8	25.0	---	---
Bullying victimization	20	62.5	---	---
Fighting in past year	15	46.9	---	---
Interpersonal aggression in past 6 months	17	53.1	---	---

Note. Anxiety and depression symptoms were measures using Patient Health Questionnaire 4 (PHQ-4); Family connectedness was measured using Parent-Family Connectedness Scale; Suicide attempt history was measured using Columbia-Suicide Severity Rating Scale; Non-suicidal self-injury and fighting were measured using Youth Risk Behavior Survey; Substance use was measured using Drug Use Scale; Alcohol use was measured using Alcohol Use Disorders Identification Test-Consumption; Bullying victimization was measured using items from World Health Organization's Health Behaviour Survey; Interpersonal aggression was measured using Impulsive Aggression Quick Screen.

Table 3.2. *Examination of interpersonal conflict, bullying involvement, and social withdrawal on case and control days*

| | Adolescent Report (N = 31) | | | | | Parent Report (N = 32) | | | | |
| | Control | | Case | | | Control | | Case | | |
	n	*%*	*n*	*%*	*p*	*n*	*%*	*n*	*%*	*p*
Interpersonal conflict	5	16.1	18	58.1	.00	7	21.9	15	46.9	.02
Negative romantic event	2	6.5	2	6.5	---	3	9.4	4	12.5	---
Serious conflict with parents	3	9.7	9	29.0	.03	3	9.4	8	25.0	.13
Negative relationship event with others	1	3.2	11	35.5	.00	4	12.5	10	31.3	.07
Bullying involvement	5	16.1	9	29.0	.22	4	12.5	10	31.3	.03
Bullying victimization	5	16.1	7	22.6	.63	3	9.4	3	9.4	---
Bullying perpetration	0	0.0	4	12.9	---	2	6.3	7	21.9	.06
Social withdrawal	17	54.8	24	77.5	.04	14	43.8	20	62.5	.03

Note. McNemar's tests were used to calculate differences between case and control days.

Table 3.3. *Multivariate model examining impact of interpersonal conflict, bullying involvement, and withdrawal in the 24-hours prior to a suicide attempt*

	Control (%)	Case (%)	p	OR	OR 95% CI	
Interpersonal conflict	5 (16.1)	18 (58.1)	.038	0.08	0.01,	0.87
Bullying involvement	5 (16.1)	9 (29.0)	.831	1.37	0.08,	24.04
Withdrawal	17 (54.8)	24 (77.5)	.178	0.23	0.03,	1.97

Note. Conditional logistic regression was used to examine the effects of interpersonal conflict, bullying involvement, and withdrawal on the odds of making a suicide attempt, per adolescent report.

Table 3.4. *Examination of adolescent cognitions and emotions on case and control days (N =31)*

	Control		Case		*t*	*p*
	M	*SD*	*M*	*SD*		
Cognitions						
I thought people in my life would be happier or better off without me	3.00	1.71	3.19	1.69	0.78	.44
I thought I did not belong	3.39	1.65	3.69	1.60	2.53	.02
I thought I was a failure and not as good as others	3.97	1.38	3.91	1.45	-0.37	.71
I had angry/hostile thoughts about others	1.48	1.73	1.56	1.66	.060	.56
Emotions						
I felt anger or rage toward someone else or others	1.29	1.53	1.91	1.73	2.79	.01
I felt alone	3.63	1.65	4.06	1.41	1.90	.07
I felt ashamed	2.68	1.80	3.22	1.76	3.23	.00
I felt close to people at my school	1.77	1.84	1.88	1.70	0.50	.62
I felt like I had friends I'm really close to and trust	2.32	1.85	2.31	1.79	0.24	.81
I felt people in my family understood me	1.42	1.39	1.44	1.39	0.81	.42

Note. Paired sample *t*-tests were used to calculate differences between case and control days.

CHAPTER IV

Summary and Conclusions

The primary goal of this dissertation was to gain a more refined understanding of the proximal and distal relationship between interpersonal conflict, social connectedness, and risk for suicidal ideation and attempts among adolescents. The first study examined the relationship between bullying victimization severity and suicide risk, as well as how this relationship is moderated by subtypes of interpersonal connectedness (family, school, community). The second study examined interpersonal conflict, bullying involvement, and withdrawal as suicide attempt warning signs. Results from both studies converge to highlight the importance of adolescents' experiences of interpersonal conflict and social withdrawal to our understanding of risk for suicidal ideation and suicide attempts. Specifically, results emphasize the criticality of comprehensively weighing interpersonal factors, including bullying involvement, social isolation and other forms of interpersonal conflict when contextualizing adolescent's risk for suicidal ideation and attempts. An improved understanding of the interplay and impact of interpersonal challenges and social connectedness can have important implications in the conceptualization of risk and could inform prevention and intervention approaches.

The first study allowed us to improve our understanding of how interpersonal factors, specifically social connectedness, function to protect youth from the negative prospective impact of adverse interpersonal experiences, namely bullying victimization. Findings suggested that family, school, and community connectedness were prospectively associated with self-esteem, depression, and suicidal ideation. However, school connectedness was the only domain examined which buffered the negative impact of bullying victimization on self-esteem and suicidal ideation. Additionally, school connectedness protected youth from the negative impact of electronic victimization on suicidal ideation and relational victimization on self-esteem. In sum, results point to social connectedness, specifically in the school settings, as a potential avenue for decreasing the negative impact of bullying victimization.

The second study narrowed in on the hours prior to a suicide attempt. By examining how the 24 hours prior to a suicide attempt differ from a comparison 24-hour period (without a suicide attempt), we were able to identify potential near-term predictors of adolescent suicide attempts. Findings generally support the importance of interpersonal factors as suicide attempt warning signs from the perspective of both adolescents and parents. Specifically, our interviews with adolescents and parents revealed that interpersonal conflict and social withdrawal are significant warning signs for suicide attempts. In sum, results emphasize how the near-term conceptualization of suicide risk should consider a thorough assessment of a broad range of interpersonal factors.

Taken together, results from both studies converge with previous empirical findings which link a range of interpersonal factors, including bullying involvement, social connectedness, social withdrawal, and interpersonal conflict to suicide risk. Jointly, findings have important implications for both prevention and intervention efforts. Unlike some other risk characteristics, interpersonal factors are malleable, and though change can be effortful, it can be targeted. For example, in academic settings, schools can focus efforts to prevent and intervene in the face of victimization, as well as build programs to increase school connectedness. Schools also provide an ideal venue to increase awareness of suicide warning signs, as well as act when warning signs are observed to identify adolescents at acute risk and in need of immediate help. In the home setting, parents can increase vigilance and provide immediate support when youth withdraw or following an instance of interpersonal conflict. In clinical settings, providers can assure that they are continuously assessing suicide attempt warning signs as well as prioritize interventions known to impact interpersonal conflict. In crisis settings or situations, providers can ground decisions regarding higher levels of care or discharge planning on a conceptualization of suicide risk which incorporates a comprehensive understanding of interpersonal factors. Across settings, empirically supported suicide attempt warning signs can be disseminated to those who interact with adolescents (e.g., parents, peers, teachers, school staff, medical providers) so that they can better identify youth at risk and connect them to the care needed. Taken together, both studies add meaningfully to the field as they narrow in on malleable factors that impact suicide risk among youth and which can be targeted across time and settings.

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