Co-rumination, Romantic Relationships, and Depressive Symptom Development in Adolescence

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CO-RUMINATION, ROMANTIC RELATIONSHIPS, AND DEPRESSIVE SYMPTOM DEVELOPMENT IN ADOLESCENCE

by

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B.A. University of Minnesota, 2015

M.A., University of Maine, 2018

A DISSERTATION
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The present research aimed to better understand the associations among romantic involvement, co-rumination with friends, and depressive symptom development in a sample of 338 adolescents (ages 14-19 years). Using a multi-method, longitudinal study design, the present study examined whether co-rumination (self-reported and observed) mediated the relationship between romantic involvement and depressive symptoms over time. Next, analyses separately tested whether this process was further moderated by positive friendship quality, whether youth discuss romantic experiences during problem talk with friends, and/or gender. Analyses also tested whether romantic relationship quality among romantically involved youth influenced depressive symptoms over time via co-rumination.

Results supported an indirect effect of romantic involvement on later depressive symptoms via self-reported (but not observed) co-rumination, suggesting that romantically-involved youth who self-report engaging in co-rumination may be more prone to depressive symptom development. There was little support for the association being further moderated by discussing romantic problems, friendship quality, and/or gender. Moreover, results did not
support hypotheses that co-rumination would mediate the link between romantic relationship quality and depressive symptoms over time. Future studies should assess the content of romantic co-rumination more specifically to better understand its impact on the link between romantic involvement and depression. Future research also could recruit larger and more diverse samples of youth to obtain sufficient variability in romantic involvement, gender identity, and friendship composition (e.g., same gender, gender diverse). Potential contributions of this research for the development of evidence-based interventions for youth with depressive symptoms are explored.
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CHAPTER 1:
INTRODUCTION

Synopsis

The normative emergence of romantic experiences (i.e., attraction, romantic relationships; Collins, 2003) and increased risk for emotional difficulties (i.e., depressive symptom development; Natsuaki et al., 2009; Saluja et al., 2004) at adolescence is well-evidenced in the literature, especially among adolescent girls (Cyranowski et al., 2000; Nolen-Hoeksema, 2000). Studies have found an association between engagement in romantic relationships and depressive symptoms (e.g., Davila, 2008; Davila et al., 2009a; Joyner & Udry, 2000), yet the mechanisms underlying this association remain unclear. One possible explanation that has received recent attention is the potential role of co-rumination, or perseverative, negatively-oriented problem-talk, typically occurring within adolescent female friendships (Rose, 2002), due to its contradictory link with both friendship benefits and depressive symptom development. Indeed, there is research to support a stronger association between co-rumination and depressive symptoms among romantically-involved adolescent girls (Starr & Davila, 2009).

However, there is no evidence to support why romantically-involved adolescents may be more likely to engage in co-rumination and experience greater risk for depressive symptoms. It is possible that romantic experiences may create increased emotional distress and subsequently more problems to discuss with friends (Davila, 2008; Starr & Davila, 2009), but this has not yet been explored. Given the chronicity of adolescent-onset depressive symptoms (e.g., Birmaher et al., 2004) and the associated impairments across various aspects of functioning (e.g., Thapar et al., 2012), these are important areas for research inquiry to enhance understanding of adolescent depression.
The current study addresses associations among romantic involvement, co-rumination with friends, and depressive symptom development in an adolescent sample (14 to 18 years), using a multi-method, longitudinal study design (across three time-points). First, the current study examines the longitudinal association between romantic relationship involvement and later depressive symptom development as mediated by co-rumination (Aim 1). Next, the study assesses whether the longitudinal association between positive romantic relationship quality and later depressive symptoms is mediated by co-rumination (Aim 2), and whether the longitudinal association between romantic involvement and later depressive symptoms as mediated by co-rumination is moderated by positive friendship quality (Aim 3), and observed discussion of romantic problems (Aim 4). Finally, the association in Aim 1 was examined regarding the role of gender (Aim 5). Notably, each aim is tested using both self-reported and observed co-rumination.

The following sections discuss in detail the development of romantic experiences and romantic relationships at adolescence, with consideration of the tradeoffs of involvement in romantic experiences for emotional adjustment, particularly depressive symptoms. Next, the importance of depressive symptoms is described, with particular focus on the etiological context of interpersonal relationships. Then, the role of friendships, as another salient source of support at adolescence, is considered, in regards to depressive symptom development among romantically-involved youth. In particular, the potential role of co-rumination with friends among romantically-involved youth is explored. Notably, to best situate the current study within the bulk of the existing adolescent peer relations literature, the current study focuses on heterosexual romantic experiences and same-gender friendships in adolescence.

**Romantic Experiences and Romantic Relationships in Adolescence**

Although the terms “romantic experiences” and “romantic relationships” are often used interchangeably, a closer look reveals differences in accepted definitions. According to Collins,
Welsh, and Furman (2009), the term “romantic experiences” refers to a wide range of romantic behaviors, cognitions, emotions, and activities that range in intensity and duration, and these experiences may or may not be mutual. For example, romantic experiences include romantic fantasies, desires, and attraction (i.e., “crushes”), as well as spending shared time with a romantic interest (e.g., going on dates).

Romantic relationships are considered to be one aspect of romantic experiences. Romantic relationships are defined as voluntary, reciprocal, and intimate relationships, marked by normative expectations of physical affection (Collins & Laursen, 2000). Compared with other romantic experiences, romantic relationships more commonly refer to exclusive partnerships. Romantic relationships are often characterized as having a distinct intensity from other intimate relationships such as friendships and/or family relationships (Collins, 2003; Shulman & Seiffge-Krenke, 2001). Although attention to the broader category of romantic experiences in adolescence is growing, the adolescent romance literature is predominately focused on heterosexual romantic relationships (Collins et al., 2009).

**The Developmental Significance of Adolescent Romantic Relationships**

Adolescence has been defined variably throughout the literature with some researchers believing the period begins as early as age 10 years and extends into the early twenties (Collins et al., 2009). Romantic relationships are considered a key feature of this broad developmental period. Although over a decade of research now supports the normativity and developmental significance of romantic relationships (e.g., Carver et al., 2003; Collins, 2003; Davila, 2008), this notion was once considered controversial (Collins, 2003). In fact, adolescent romantic relationships were previously believed to be brief, trivial, or even indicative of maladjustment (Collins, 2003; Furman & Shaffer, 2003). Research has since supported that “crushes” and romantic interests often emerge in childhood (e.g., elementary school; Thorne & Luria, 1986)
and are increasingly common into early adolescence (Bowker et al., 2012) at the same time that romantic relationships commonly emerge (Collins, 2003).

In a seminal paper, Collins (2003) documented that, on average, youths’ first romantic relationships emerge at 11 years of age. Across adolescence, these relationships become increasingly common, with an estimated 70% of 18-year-olds identifying as being involved in a romantic relationship in the past year (Carver et al., 2003). Additionally, findings supported that an increasing percentage of youth have lasting romantic relationships as they age. About 20% of 14-year-olds reported a romantic relationship lasting 11 months or longer, and 60% of 17- and 18-year-olds report having a relationship lasting that long. More recent studies continue to support the positive association between age and average length of romantic relationships (Lantagne & Furman, 2017). Given these findings, there has been increasing acceptance in recent decades that romantic relationships are a central feature of adolescence.

**Developmental Theory**

Developmental theories aim to explain various aspects of adolescent romantic relationships. More specifically, theories of romantic relationship formation illustrate the normative development of romantic relationships and their distinctions from other peer relationships (e.g., Connolly et al., 2000; Connolly et al., 2004; Collins, 2003; Shulman & Seiffge-Krenke, 2001). Of note, the majority of theory and research to date has focused on heterosexual romantic relationships between cisgender men and women and have restricted inquiry to individuals identifying within the gender binary. As such, this is the focus of the following literature review. It is proposed that there is a normative shift from shared time with same-gender friends to cross-gender friends during adolescence that may facilitate first romantic interest for heterosexual youth across the developmental period (Connolly et al., 2004; Feiring, 1999). Specifically, researchers have described phases of heterosexual romantic relationship
formation to include initiation (romantic attraction), affiliation (exploring potential partners within a mixed-gender peer group), and commitment (the formation of a mutual relationship; Meier & Allen, 2009).

Theory and research also support a shift in the quality and content of romantic relationships across adolescence, such that romantic relationships grow in intimacy across development (Collins, 2003; Shulman & Connolly, 2013). In early adolescence, partner selection is often based upon superficial features, such as physical attraction and status among peers. By late adolescence, romantic relationships are more commonly initiated from shared interests and values (Collins, 2003; Collins et al., 2009). Additionally, research supports that in early adolescence, romantic partners tend to spend time together in the context of peer groups, but couples gradually spend more time as dyads into late adolescence, contributing to increased intimacy (Meier & Allen, 2009; Seiffge-Krenke, 2003). Additionally, as expected, engagement in sexual activities becomes a more frequent and normative aspect of romantic relationships into late adolescence, and this emergence of sexual activity marks a shift in intensity of a relationship as well (Zimmer-Gembeck et al., 2004).

Theories also describe gender differences in adolescent romantic relationships, although few gender differences have been well-supported by research or focus on features beyond sexuality (Meier & Allen, 2009). For example, sexual script theory (Tolman, 2013) posits that, due to societal expectations, boys are encouraged to engage in sexual experiences while girls are socially sanctioned for doing so. This socialization is thought to lead to observed gender differences in sexual behavior. It follows, then, that boys report more involvement in casual, non-exclusive romantic relationships than girls (Davies & Windle, 2000; Meier & Allen, 2009), while girls report greater involvement in and longer maintenance of romantic relationships than boys after the age of 15 (Meier & Allen, 2009).
Studies have also offered some support for gender differences in desired behavior in romantic relationships. Boys have endorsed greater interest in engaging in sexual behavior in romantic relationships than other romantic behaviors (Cavanagh, 2007; Choukas-Bradley et al., 2015). Relatedly, a study by Cleveland (2003) found that boys endorsed greater desire for engagement in sexual intercourse earlier on in the progression of normative romantic experiences than did girls. However, studies of actual romantic behaviors have demonstrated few gender differences in romantic behavior and quality (Bradshaw et al., 2010; Choukas-Bradley et al., 2015).

Importantly, the generalizability of these theories and empirical data is limited by the lack of inclusivity and diversity in the samples studied. Gender non-conforming youth and sexual minority youth are rarely considered in theories of or empirical research on romantic relationship formation across adolescence (Meier & Allen, 2009; Shulman & Seiffge-Krenke, 2001). The few studies of sexual minority differences that exist tend to focus on adult samples (Mustanski, 2015) and on males (Choukas et al., 2015). These studies typically suggest similarities between ideal qualities of partners identified by heterosexual and sexual minority youth (i.e., intimacy, commitment; Bauermeister et al., 2011; Choukas-Bradley et al., 2015). Additionally, adolescents from minority racial or ethnic groups are often unfortunately excluded from empirical studies that test existing developmental theories of romantic relationships (Connolly & McIsaac, 2009). In other words, theory and research on romantic relationship development is currently limited by the lack of diverse participants, and, as such, may not represent the experiences of minority youth.

**Features of Romantic Relationships**

The developmental significance of romantic relationships at adolescence is often qualified by the features of these relationships. Some of the most commonly studied features
include involvement, partner characteristics, and the content and quality of relationships. Below, the features and typical approaches to assessing each will be briefly described. It is important to note that these features often overlap and are frequently assessed together in order to provide a comprehensive understanding of adolescents’ romantic relationships (Furman & Shaffer, 2003).

**Involvement.** There is considerable attention in the literature to adolescents’ involvement in dating relationships and whether or not adolescents are engaged in a casual or more serious dating relationship (Kuttler & La Greca, 2004). Involvement is typically assessed through self-reported current or past participation in romantic relationships (Furman & Buhrmester, 2009), the frequency or number of romantic partnerships over a given amount of time, and/or the developmental timing (i.e., when during adolescence the romantic relationship was initiated) of dating relationships (Collins et al., 2009; Halpern, 2003). Data are typically gathered through self-report questionnaires or interviews (Furman et al., 2007). Self-reported sexual orientation is another aspect of involvement that is measured and may differ from actual sexual or romantic behavior (Diamond, 2003; Savin-Williams, 2006). For example, youth that identify as homosexual may or may not be involved with a partner of the same gender (Petersen & Hyde, 2010; Savin-Williams, 2006).

**Partner characteristics.** Although research on romantic partner characteristics focuses predominately on adult samples (Collins et al., 2009), there is a growing literature that examines characteristics of romantic partners during adolescence. Partner characteristics refer to the qualities of and criteria by which adolescents select their romantic partners (Collins et al., 2009; Simon et al., 2008). Assessment of partner characteristics typically refers to self-reported ideal versus actual or observed qualities of a partner, but very few studies analyze this comparison in adolescent samples as compared to adult samples (Collins et al., 2009). Instead, most of the adolescent literature focuses on self-reported descriptions of an ideal partner or on the common
features shared by adolescents and their romantic partners. Findings often indicate that romantic partners tend to be similar to one another on a number of demographic (i.e., age; Collins, 2003) and socio-emotional variables (e.g., popularity among peers; Simon et al., 2008). Research also indicates that youth, like adults, seek traits similar to themselves in a romantic partner (e.g., social competence, physical attractiveness; Regan & Joshi, 2003).

**Content.** Additionally, content, or the substance of the shared activities and behaviors within a romantic relationship, is another focus of adolescent romantic relationship research (Collins et al., 2009). Naturally, the content of romantic relationships differs from other peer or parent relationships (e.g., Collins & Laursen, 2004). Notably, the literature on content has focused primarily on measuring the frequency and intensity of engagement in sexual and aggressive behavior in romantic relationships (Collins et al., 2009), perhaps due to the unique opportunity for youth to experience both sexual and aggressive behavior in this romantic relationship context. As previously noted, adolescents’ first sexual experiences normatively occur within the context of first romantic relationships, a distinction that delineates romantic relationships from other relationships (Zimmer-Gembeck et al., 2001). Unfortunately, physical aggression in both heterosexual and same-gender adolescent couples has been documented in empirical studies, with prevalence rates of occurrence cited in between 10-48% of couples, depending on the sample (Jouriles et al., 2005). This area of research primarily utilizes self-report measures or interviews to estimate the prevalence of sexual and/or aggressive behaviors.

**Cognitive and emotional processes.** Although they greatly overlap with the above features, cognitive and emotional processes also are often measured within adolescent romantic relationships. These processes refer to desires, appraisals, and emotional experiences in romantic relationships (Collins et al., 2009). For example, measurement of cognitive processes often involves assessment of desired qualities in a relationship, such as closeness. As with other
features, adolescents tend to desire relationships of increasingly intimate features with age. Additionally, assessment of affect (i.e., positive, negative) within romantic relationships is common, as is proneness to different emotions, feelings of self-worth (Connolly & Konarski, 1994), and associated implications for emotional maladjustment (e.g., Joyner & Udry, 2000). Another largely studied area of cognitive and emotional processes is rejection sensitivity, the expectation that one will be rejected by a romantic partner and/or the tendency to perceive rejection more readily (Downey et al., 1999; Downey et al., 1998).

**Romantic relationship quality.** Romantic relationship quality has been defined as the degree of intimacy, affection, and/or nurturance in a romantic relationship, and quality can be conceptualized as high or low and as positive or negative (Collins et al., 2009). The literature on the quality of adolescents’ romantic relationships is growing but is generally more limited than research on other characteristics of adolescent romantic relationships, such as involvement and content (Vujeva & Furman, 2011). Positive qualities include high levels of intimacy, supportiveness (Galliher et al., 2004), and communication (Furman & Buhrmester, 2009). Negative qualities include antagonism, irritation, controlling behavior, or inequality of power (Galliher et al., 2004; Welsh et al., 1999). Low quality relationships can be marked by low levels of positive qualities and/or high levels of negative qualities; relatedly, high quality relationships may be high in positive and/or low in negative qualities (Collins et al., 2009).

Romantic relationship quality is assessed through self-reports and observation measures, although the significant majority of current literature is based upon self-report data (Welsh & Shulman, 2008). One common self-report measure is the Network Relationships Inventory (NRI; Furman & Buhrmester, 1985). The NRI was specifically developed to assess individuals perceived provisions or positive qualities (e.g., affection, intimacy) and negative qualities (e.g., conflict, poor conflict resolution) of a multitude of close relationships (e.g., parents, friends),
including romantic relationships. As such, the NRI is commonly used to address and compare the qualities of multiple intimate relationships, and the instrument can be administered to both partners to assess match (or mismatch) in perception (Furman, 1996; Furman & Buhrmester, 2009).

Direct observation methodology is also used, albeit infrequently, and observations typically involve video-recordings of adolescent partners discussing topics of conflict (Welsh & Shulman, 2008). Interactions are then coded for micro- and/or macro-level features of positive and negative qualities, similar to those assessed by the NRI (Furman & Shomaker, 2008). Expectedly, assessing for both self-reported and observed romantic relationship quality is considered advantageous. Research suggests that direct observation allows for the assessment of dynamics that may otherwise be underreported in self-report measures, particularly in adolescence (Welsh et al., 1999; Welsh & Shulman, 2008). Indeed, some studies have found discrepancies in self-reported and observed quality of adolescent romantic relationships (Furman & Shomaker, 2008), such that adolescents may self-report more positive and fewer negative emotional experiences in romantic relationships than are objectively observed. Moreover, if self-report measures are administered to both romantic partners, partner perceptions can be compared. However, some scholars argue that these discrepancies in perception are not differentially associated with emotional adjustment outcomes (Welsh et al., 1999).

**Methodological challenges in assessing romantic relationships.** The assessment of adolescents’ romantic relationship features is limited by methodological challenges that are linked to the very nature of adolescents’ romantic relationships (Collins, 2003). The ways in which romantic relationships are defined pose a challenge to assessment; not only is there discrepancy in how researchers determine a partnership (e.g., reciprocal identification), but also there is no agreed upon length of time in which partners have dated to be included in a study.
ADOLESCENT CO-RUMINATION, ROMANCE & DEPRESSION

(Furman & Hand, 2006). Additionally, features of adolescent romantic relationships are primarily measured through self-report rather than observational measures, in large part due to the transitory nature of adolescent romantic relationships (Furman & Shomaker, 2008; Welsh & Dickson, 2005).

Given that adolescents are involved in relationships for a year or less on average (Collins, 2003), relationships may dissolve or may not be established enough for adolescents to feel comfortable being observed in a study (Welsh & Dickson, 2005). This is also a limitation of the development of longitudinal studies, and as such, the literature extensively relies on cross-sectional design (Davila, 2008). Moreover, although self-report from both partners are included in some studies, the brevity of adolescent relationships may pose a challenge for gathering both partners’ experiences (Collins, 2003; Collins et al., 2009). Finally, as previously described, most of the assessment methods were developed from studies of heterosexual, predominately White samples (Collins et al., 2009). As detailed below, the current study adds to the literature by including a longitudinal, multi-method study design. Moreover, adolescents of diverse sexual orientations and relationships of any length of time were included, which serves to capture a broader range of adolescent romantic relationships.

Provisions of Adolescent Romantic Relationships

Developmental theorists have posited that the formation and maintenance of romantic relationships is a central developmental task of adolescence (Collins, 2003; Furman & Shaffer, 2003; Sullivan, 1953), due to their normativity at this period and the potential benefits they serve for various aspects of identity and emotional development. In the past decade, there has been increasing evidence that involvement in romantic relationships and the content and quality of romantic relationships can lead to provisions that are central to adolescent development (Collins
et al., 2009). Although research on the provisions of romantic involvement, content, and quality naturally overlap, each area of research will be reviewed separately below.

**Involvement.** Research supports that involvement in romantic relationships contributes significantly to identity development from adolescence into adulthood. Specifically, studies indicate that early dating experiences can contribute to the development of positive self-esteem and feelings of global self-worth (Collins et al., 2009), perhaps due to the opportunities for feelings of acceptance and desirability that can be inherent in dating (Shulman & Seiffge-Krenke, 2001; Zimmer-Gembeck et al., 2001). Involvement is further theorized to be linked to forming self-perceptions in romantic contexts, otherwise referred to as romantic self-concept (Furman & Shaffer, 2003), which includes perceptions of one’s attractiveness and worth. As such, it follows that self-concept in a romantic context contributes to global self-esteem and competence, and these contributions are importantly distinct from those made by participation in other close relationships (e.g., family, friends; Furman & Shaffer, 2003; Harter, 1988; Seiffge-Krenke, 2003; Zimmer-Gembeck et al., 2001). Moreover, recent studies have suggested that for youth with certain marginalized sexual or racial identities (e.g., Black, gay/lesbian), romantic relationship involvement may be a protective factor for general psychological wellbeing as a potential buffer for victimization based on sexual minority status (Whitton et al., 2018). This highlights the complexity of this association and need for further research.

Involvement in romantic relationships may provide provisions for youths’ other close relationships. Research has linked romantic involvement with increased social competence and higher friendship quality (Brendgen et al., 2002; Furman & Shomaker, 2008; Taradash et al., 2001; Zimmer-Gembeck et al., 2001). Following developmental theory, greater social competence may be a reflection of the formation of heterosexual dating experiences through increased time spent with mixed-gender peer groups (e.g., Collins et al., 2009; Meier & Allen,
Theory further supports that first dating experiences are initiated with the goal of gaining increased status among other peers, especially in early adolescence (Collins et al., 2009). The formation of a romantic partnership may also lead to opportunities to meet new friends through the partner, particularly in older adolescence (Zani, 1993). Thus, it is possible that heterosexual adolescents with greater social competence are becoming more readily involved in dating relationships through time spent in the broader peer group; alternately, initiation into dating relationships may pose opportunities for gaining increased social competence (Kuttler & LaGreca, 2004).

Content. The content of adolescent romantic relationships can foster identity development as well. For example, first sexual experiences in the context of romantic relationships contribute to sexual identity development (Furman & Shaffer, 2003). With natural shifts in biological maturation during puberty, sex drive increases normatively during adolescence, prompting first sexual attractions and experimentation. Casual and committed relationships are identified as the primary context for participating in first sexual experiences (Furman et al., 2009; Zimmer-Gembeck et al., 2004), and early romantic relationship involvement is reliably linked with a higher likelihood of engaging in sexual activity by age 19 (Zimmer-Gembeck et al., 2004). These first sexual experiences can foster the development of sexual orientation. Indeed, studies suggest that many non-heterosexual youth are first involved in heterosexual relationships at this time and may be disinterested, which fosters increased understanding of their sexual preferences (Diamond et al., 1999; Furman & Shaffer, 2003).

Romantic relationship quality. Relatedly, adolescent romantic relationships that are high in quality may contribute positively to adolescents’ general development and to their emotional outcomes more specifically. In fact, the positive qualities of relationships (e.g., companionship, affection, intimacy) can be considered provisions in and of themselves. Research
has linked romantic relationship quality with various aspects of adolescent development (Collins et al., 2009), including the development of global and romantic self-concept, social competence, and emotional adjustment. High-quality romantic relationships—marked by communication, attraction, displays of affection, and support—are unsurprisingly linked to the experience of positive emotions (Nieder & Seiffge-Krenke, 2001) and increased self-esteem (Furman & Shaffer, 2003).

Further, experiences of both positive and negative qualities of early romantic relationships are conceptualized as providing a training ground for future relationships into adulthood. In line with developmental theory (Sullivan, 1953), it is argued that early romantic relationships pose opportunities to build the skills associated with romantic relationship competence in adulthood. The development of skills for romantic competence tends to be linked with increased involvement and maintenance of romantic relationships, as well as increased quality and content (Norona et al., 2017b; Davila et al., 2009a). Notably, there is a normative shift to higher quality relationships across adolescence (Collibee & Furman, 2015; Nieder & Seiffge-Krenke, 2001), such that dating experiences in later adolescence appear to become gradually more intimate and supportive, which may be related to increased longevity of relationships (Taradash et al., 2001). Relatedly, studies indicate that older adolescents consider support from a romantic partner to be more important than support they receive from other intimate relationships (e.g., parents, peers; Seiffge-Krenke, 2003).

Some researchers have further asserted that the salience of romantic relationship quality for adolescent development is due to the opportunities provided by these relationships for youth to build problem-solving and emotion regulation skills for future relationship contexts (Davila et al., 2009a). For instance, Shulman, Davila, and Shachar-Shapira (2011) outlined that ideally, early romantic experiences should lead to the development of skills related to romantic
involvement (i.e., maintaining relationships of relatively long duration), social cognitive maturity (i.e., balancing self and partner’s needs), coherence (i.e., a balanced perception of a romantic relationship), and romantic agency (i.e., adaptive management of romantic relationship stress).

Interestingly, some research suggests that these skills may be developed in the context of adolescent romantic relationships, regardless of the age of the youth or the quality and longevity of the relationship. In a longitudinal, qualitative study of early and late adolescents, Norona and colleagues (2017b) identified the relationship skills outlined by Shulman et al (2011) in continued and dissolved relationships. Specifically, participants (ages 15-23) were asked to identify and reflect upon the lessons they learned in romantic relationships from the previous year. Responses were analyzed for social cognitive maturity, romantic agency, and coherence (as proposed by Shulman et al., 2011). Findings suggested that adolescents with sustained relationships approximately one year later and older adolescents reported lessons related to social cognitive maturity (i.e., maintaining a balance between self and partner needs) and coherence (i.e., development of a balanced perception of a romantic relationship). Those who experienced a breakup and younger adolescents reported lessons that fit with romantic agency (i.e., gaining adaptive skills to manage romantic stress). These findings further highlight the importance of early dating experiences, regardless of their quality, for the development of romantic competence skills for the future.

Following developmental tasks theory (e.g., Roisman et al., 2004), some researchers have suggested that the initiation and maintenance of romantic relationships is an emerging developmental task at adolescence, and as such, researchers argue that quality of romantic relationships may not be as salient as other relationships at this stage of development (i.e., friendship formation) for later outcomes (e.g., Roisman et al., 2004; Roisman et al., 2009). Yet, a growing number of studies suggest that early romantic relationship quality and intimacy does
indeed impact current and later functioning (e.g., Collibee & Furman, 2015; Williams et al., 2001). In particular, poor quality romantic relationships in adolescence appear to be associated with concurrent and longitudinal psychosocial consequences (Davila, 2008).

**Adolescent Romantic Relationships and Associated Risk**

Despite the aforementioned provisions offered by participation in adolescent romantic relationships, these relationships also appear to be linked with increased risk for negative social and emotional outcomes. As a novel relationship domain that emerges at adolescence, the literature highlights romantic relationships as a context for stressful or problematic situations and negative emotions (Collins, 2003; Davila, 2008; Nieder & Seiffge-Krenke, 2001). Adolescents may have insufficient skills to manage these new, and possibly negative experiences (Connolly & McIsaac, 2009; Norona et al., 2017b). Research on the risks associated with adolescent romantic experiences has primarily focused on links of involvement, content, and quality with negative socioemotional outcomes (Collins et al., 2009), and each area of research is described below.

**Involvement.** First, involvement in romantic relationships during early adolescence is linked with negative socioemotional consequences. This is perhaps due to the increased opportunity for actual or perceived rejection by partners (Downey et al., 1998). For instance, involvement in romantic relationships inherently increases the risk for relationship dissolution (i.e., a “breakup”; Joyner & Udry, 2000), as nearly all early romantic relationships will, at some point, end. Breakups are consistently identified as a common and distressing experience during adolescence that often evokes negative emotions such as feelings of stress, shame, and rejection to which adolescents may be particularly attuned and sensitive (Carver et al., 2003; Connolly & McIsaac, 2009; Field et al., 2009). Interestingly, non-involvement in romantic relationships is
also linked to adolescent distress, although this association has received comparatively less attention in the literature (Davila, 2008; La Greca & Harrison, 2005).

Additionally, research suggests that the degree to which involvement in romantic relationships is linked to risk for negative social and emotional consequences appears to be related to developmental timing and gender. Specifically, some studies show that earlier romantic involvement is linked with poor socioemotional adjustment (Darling et al., 1999), and academic achievement (Neeman et al., 1995). Although some researchers have theorized that this may be due to the non-normativity of romantic relationships at an earlier age (e.g., Furman et al., 2009; Zimmer-Gembeck et al., 2001), others, such as Furman and Collibee (2014), have not obtained support for this theory. Instead, they found that earlier romantic involvement was indeed linked to higher risk for negative outcomes, but this was due to it being an emerging developmental task (consistent with developmental task theory).

Moreover, early romantic relationship involvement appears to exacerbate negative outcomes particularly for girls (e.g., Zimmer-Gembeck et al., 2004). This may be due to socialization among girls to be more attuned to (e.g., Davila, 2008; Rudolph & Hammen, 1999) and place greater value on interpersonal relationships, including romantic experiences (e.g., Davila, 2008; Feiring, 1996). Yet, much of the literature on this topic consists of all female samples (e.g., Davila et al., 2009b; Starr & Davila, 2009; Starr et al., 2012), and as such, there is much more to understand about this topic.

**Content.** Additionally, the content of romantic relationships can introduce opportunities for uniquely stressful or challenging situations compared to experiences in family or friendships that can lead to negative emotions (Furman & Shaffer, 2003; Furman & Shomaker, 2008; Seiffge-Krenke, 2011). Recent research indicates that the frequency of infidelity, or “cheating,” in romantic relationships is heightened in adolescence (Norona, 2013). Infidelity in adolescent
romantic relationships is linked with poor quality relationships and reduced well-being of the individual partners involved (Tsapelas et al., 2010). Emotional reactions that are commonly associated with such experiences (e.g., shame, guilt) may be difficult for adolescents to effectively manage at this age (Norona, 2013; Seiffge-Krenke, 2011). Moreover, first sexual experiences are associated with risk for sexually transmitted diseases or (for heterosexual couples) unwanted pregnancy, as well as related social consequences of early engagement in sexual risk behavior (e.g., low peer acceptance; Furman et al., 2009; Zimmer-Gembeck et al., 2004). Studies have identified that these outcomes are particularly consequential and problematic for young girls who engage in more intimate sexual acts, such as genital stimulation, perhaps due to conflict between these behaviors and societal expectations for girls (Zimmer-Gembeck et al., 2001).

**Romantic relationship quality.** Low relationship quality (i.e., low positive quality and/or high negative quality) is also associated with heightened risk experiences that can lead to distress (e.g., Linder & Collins, 2005). For instance, research suggests that adolescent romantic relationships are a distinct interpersonal context in which the experience of conflict is common. In an observational study, Furman and Shomaker (2008) found that adolescents engaged in more conflict discussion with romantic partners than with parents or friends. It is possible that increased conflict in romantic relationships as compared to other relationships is due to unique challenges and dynamics in a romantic partnership (e.g., interdependence, power dynamics; Nieder & Seiffge-Krenke, 2001) or the opportunities for the experience of negative content, as previously described (e.g., infidelity, sexual risk; Norona et al., 2017a).

Researchers have hypothesized that romantic relationship conflict may stem from the intensity of balancing a partner’s needs with an adolescent’s own needs, along with the expectations of intimacy in a romantic relationship (Norona et al., 2017a; Shulman et al., 2011).
Moreover, research suggests that conflict is often poorly resolved between adolescent romantic partners, who may either avoid the conflict or react with high emotional intensity. These typical reactions can at times escalate into aggressive behavior or even romantic relationship violence (Jouriles et al., 2005; Wolfe et al., 2001). The presence and poor resolution of conflict is a commonly cited trigger for romantic relationship dissolution (Connolly & McIsaac, 2009).

The presence of conflict and adolescents’ conflict resolution skills appear to shift developmentally, such that younger adolescents tend to report the lowest levels of romantic relationship conflict (Nieder & Seiffge-Krenke, 2001) and the highest levels of avoidance of conflict resolution (Furman & Shomaker, 2008; Seiffge-Krenke, 2011). However, findings from observational studies suggest that youth may perceive less conflict in their romantic relationships than do outside observers (Dickson, 2009; Furman & Shomaker, 2008). Together, these findings reflect that adolescents may have poor insight into or may misread their romantic relationship conflicts (Nieder & Seiffge-Krenke, 2001). Additionally, adolescents may experience less conflict in early stages of romantic relationships, due to lower levels of intimacy (Dickson, 2009; Furman & Shomaker, 2008; Welsh & Shulman, 2008). Poor conflict resolution skills among younger adolescents is commonly linked to fears of breaking up and insecurity regarding the strength of a relationship (Welsh & Shulman, 2008).

**Potential benefits of romantic relationship conflict.** However, the presence of conflict also may have positive trade-offs for adolescent development. Effective negotiation of conflict is commonly identified as one of the distinct benefits of youths’ involvement in romantic relationships (Collins, 2003; Seiffge-Krenke, 2006). Building healthy conflict resolution skills is considered an indicator of increased intimacy and positive romantic relationship quality (Collins et al., 2009; Nieder & Seiffge-Krenke, 2001). Additionally, adaptive conflict resolution skills contribute to adolescents’ identity development (Carver et al., 2003; Collins, 2003), such that
adolescents practice balancing their own needs and setting boundaries while navigating another person’s perspective (Roisman et al., 2005; Sheldon & Niemic, 2006). Further, improved conflict resolution skills appear to influence conflict resolution into adulthood (Madsen & Collins, 2011).

**Adolescent Romantic Relationships and Depression**

Expectedly, the potential stress and negative emotions that can coincide with romantic relationship involvement, content, and quality are associated with risk for emotional maladjustment (La Greca & Harrison, 2005; Nieder & Seiffge-Krenke, 2001). It is well-established that early involvement in romantic relationships and related romantic experiences is associated with risk for both externalizing problems (i.e., outwardly displayed problem behaviors) and internalizing problems (i.e., symptoms of distress experienced internally) that differ importantly by age and gender (Mash & Barkley, 2014). More specifically, externalizing emotional adjustment problems commonly refer to conduct problems or behavior dysregulation, whereas internalizing emotional adjustment problems most often refer to symptoms of anxiety and depression.

First, research indicates that early and frequent romantic involvement (e.g., having early relationships and/or many partners at a young age) is associated with various externalizing problems, including substance use (Furman et al., 2007, 2009; Zimmer-Gembeck et al., 2001; Zimmer-Gembeck et al., 2004). Involvement in romantic relationships in adolescence generally appears to be linked with greater levels of substance use and externalizing symptoms (Furman & Collibee, 2014). Moreover, engagement in sexual behavior in early adolescence is linked with deviant behavior (Starr et al., 2012), and this association continues into emerging adulthood (Furman & Collibee, 2014). Notably, findings are mixed regarding the influence of quality of relationships at a young age, with some studies indicating that quality holds little salience for
adolescent behavior or psychosocial adjustment problems (Zimmer-Gembeck et al., 2001), while others suggest that quality of romantic relationships is also associated with substance use, poor emotional health, and externalizing symptoms (Collibee & Furman, 2015; Furman & Collins, 2009). Generally, it appears that quality may have a greater influence on externalizing behaviors in later adolescence, as romantic relationships become more salient (van Dulmen et al., 2008).

Early romantic involvement and sexual behavior also have been linked to internalizing problems such as anxiety, particularly for younger adolescents and girls (Davila, 2008; La Greca & Harrison, 2005; Madsen & Collins, 2011; Starr et al., 2012; Zimmer-Gembeck et al., 2004). This association has been demonstrated for content and quality of romantic relationships as well, especially among girls (Collibee & Furman, 2015). Notably, the association between involvement and internalizing symptoms differs developmentally; involvement in early adolescence is linked with greater internalizing symptoms, but actually is associated with fewer internalizing symptoms in later adolescence and early adulthood (Furman & Collibee, 2014). Additionally, in parallel with the association between poor romantic relationship quality and externalizing behavior, the association between poor romantic relationship quality and internalizing symptomology may become increasingly pronounced in older adolescence (Collibee & Furman, 2015). One particular form of internalizing problem, depressive symptoms, has gained increased attention in the romantic relationship literature (e.g., Davila, 2008) and will be the primary focus of the following section and the current study.

**Depression at Adolescence**

It is well-established that risk for first depressive episode markedly increases at adolescence (Klein et al., 2009; Nolen-Hoeksema & Girgus, 1994; Saluja et al., 2004). Moreover, research suggests that adolescents involved in romantic relationships are at an
increased risk for depressive symptom development (e.g., Davila, 2008). Below, criteria for
depression and symptoms are described in regards to the prevalence, developmental course, age
differences, and gender differences, as well as its importance at adolescence. Additionally, the
implications of subclinical depressive symptoms are described, then considered in regard to their
association with romantic relationships.

Depression is a prominent public health concern that is associated with significant
impairments in health and functioning (e.g., American Psychological Association [APA], 2013;
Hammen et al., 2008; Jaycox et al., 2009; McLeod et al., 2016). Diagnostic classification
systems include multiple forms of depressive disorders, with Major Depressive Disorder (MDD)
being among the most common (Angold et al., 1999; APA, 2013; Kessler & Bromet, 2013).
According to the Diagnostic Statistical Manual, fifth edition (DSM-5), MDD is characterized by
having at least one episode of persistent sadness or irritability, and accompanying thought and
behavior changes that are impairing to social, academic/work, and other areas of functioning
(APA, 2013). Depressive symptoms can include increased feelings of guilt and worthlessness,
sadness or tearfulness, diminished pleasure in things once enjoyed (i.e., anhedonia), psychomotor
agitation or retardation, and changes in appetite/weight and sleep, and fatigue. Additionally,
suicidal ideation, or recurrent thoughts of death with or without intent or a plan to harm oneself,
may be experienced (APA, 2013). To meet criteria for a major depressive episode, five or more
of these symptoms must occur within a two-week period, indicating a change in functioning.

**Prevalence.** MDD is one of the most prevalent mental health disorders among
adolescents (Hammen, 2009). Generally, risk for experiencing a depressive episode is heightened
throughout adolescence (e.g., Thapar et al., 2012), with highest risk at middle adolescence
(Natsuaki et al., 2009). Although prevalence estimates vary by population and study, the rate of
MDD is estimated to be greater than 4% by late adolescence (Thapar et al., 2012). Moreover, a
review using standardized measures to diagnose MDD across studies from the United States and other countries found a range of 2-13% for 6- or 12-month prevalence for adolescents (Avenevoli et al., 2008). More recently, an analysis of the National Survey of Drug Use and Health indicated that the 12-month prevalence of Major Depressive Episodes in 12- to 17-year-olds rose from 8.1% in 2009 to 15.8% in 2019 (Daly, 2022).

Subthreshold or subclinical depression, or elevated depressive symptoms that fall below MDD diagnostic thresholds, may be even more prevalent at this age (Klein et al., 2009). Studies have shown the prevalence of elevated depressive symptoms at late adolescence to be as high as 26%, with 12-month prevalence rates falling between 3 and 7% (Natsuaki et al., 2009). More recently, a systematic review of literature found prevalence estimates ranging from 5.3-29.2% of literature in 2015; notable studies utilized various criteria and timeframes when developing estimates (Carrellas, Biederman & Uchida, 2017). These estimates indicate that a substantial number of adolescents struggle with symptoms of depression, even if their distress does not meet diagnostic thresholds.

**Gender differences.** Gender differences in the prevalence of diagnosed depression are well-documented, beginning in adolescence (e.g., Avenevoli et al., 2015; Culbertson, 1997; Daley, 2022; Nolen-Hoeksema & Girgus, 1994; Saluja et al., 2004). Although the incidence of depressive symptoms is relatively similar across gender in childhood, the disparity in prevalence between boys and girls grows dramatically by early adolescence, with clinical and subclinical depression historically an estimated 1.5 to 3 times as prevalent among girls than boys (Lampard et al., 2014; Nolen-Hoeksema & Girgus, 1994; Salk et al., 2016; Saluja et al., 2004). There is also recent evidence that this disparity has grown more pronounced over the last decade (Daley, 2022; Salk et al., 2016). According to national estimates, the 12-month prevalence of MDE in girls increased sharply, contributing to a growing gender disparity in symptoms from 6.4% in
2009 to 14.8% in 2019 (Daley, 2022). This pattern reliably persists into adulthood (Thapar et al., 2012) and is evidenced in cross-national samples (e.g., Kessler et al., 2012; Kessler & Bromet, 2013; Merikingas et al., 2010).

**Course.** Notably, MDD tends to be chronic and recurring (e.g., Hammen et al., 2008; Thapar et al., 2012). According to the DSM-5, criteria for remission of MDD requires having few symptoms of mild severity or no symptoms for two or more months, which are rarely met (APA, 2013). More often, symptoms appear to mostly remit but then to recur with similar severity shortly thereafter. Specifically, several major longitudinal studies of depression in community samples (i.e., Hammen et al., 2008; Lewinsohn et al., 1999; Pine et al., 1998) have reported rates of recurrent MDD between 25-45% in young adulthood. In clinical samples, estimated rate of recurrence can reach 60% (Mash & Barkley, 2014).

Although likelihood of chronicity is increased by a number of factors (e.g., psychotic features, anxiety, personality disorders, increased symptom severity), one consistent finding is that adolescent-onset depression is especially predictive of recurrent episodes (see review in Mash & Barkley, 2014), suggesting that depressive symptom development in adolescence may be especially indicative of the course of depression. In fact, research suggests that major depressive episodes in adulthood are actually a recurrent form of adolescent-onset depression. Moreover, early-onset and recurrent depression prior to adulthood is a risk factor for severe and chronic depression throughout adulthood, as well as suicidality, comorbid anxiety, and poor social outcomes in early adulthood (Hammen et al., 2008). Additionally, those with subthreshold symptoms are shown to be at heightened risk for meeting criteria for a major depressive episode in the future (Cuijpers & Smit, 2004; Fergusson et al., 2005; Klein et al., 2009). Despite dramatic gender and age differences in the prevalence of depressive symptomology, few differences in the course and response to treatment of depression are apparent across gender or age (APA, 2013).
Implications and significance. The literature supports adolescent-onset depressive symptoms as a critical area of research, due to the associated risk for serious psychological and functional problems across a variety of domains. Elevated depressive symptoms in adolescence are linked with various concurrent and longitudinal consequences for functioning (e.g., Fergusson et al., 2005; Hammen, 2009; Lewinsohn et al., 2000; Wesselhoeft et al., 2013). By nature, the presence of depressive symptoms is associated with impaired work, academic, and social functioning (Hammen, 2009). Individuals experiencing depressive symptoms have reduced decision-making ability and concentration and, at their most severe, individuals with significant depressive symptoms may lose their capacity to care for themselves, experience catatonia, or even death (APA, 2013).

The presence of elevated depressive symptoms is further associated with risk for suicidality (Balázs et al., 2013; Klein et al., 2009), risk of developing MDD, and/or substance use over time (Lewinsohn et al., 2000; Maughan, Collishaw & Stringaris, 2013). Moreover, results from a 35-year longitudinal study by McLeod and colleagues (2016) indicated that adolescents who endorsed depressive symptoms (subthreshold or clinical levels) at 14-16 years old were at risk for psychosocial difficulties into adulthood. Although the association was modest after accounting for certain covariates (e.g., history of child abuse), there remained a small, significant effect between depressive symptom severity in adolescence and adjustment outcomes (e.g., anxiety, other mental health problems).

Additionally, the course of depressive symptoms and risk for poor adjustment outcomes appears to differ as a function of age of onset. As is summarized by Avenevoli and colleagues (2008), childhood-onset depressive symptoms are often linked with heterotypic continuity of symptoms, such that symptoms may not present as purely depressive symptoms in adulthood but instead are linked with other psychopathology. The authors (2008) note that homotypic
continuity is more common in adolescent-onset symptoms. As such, childhood-onset symptoms may be indicative of later significant pathology, but other correlates of depressive symptoms (e.g., family risk) may dictate whether these symptoms result in recurrent depression. Risk for associated poor outcomes appears to differ by gender in certain contexts. For example, some studies have found gender differences in adolescent depression and later unintended pregnancy or intimate partner violence victimization (McLeod et al., 2016), although this is likely linked to gender differences in risk for these problems more generally (Hammen, 2009). Together, these findings make clear that adolescent depressive symptoms at any level of severity need to be more clearly understood.

**Etiology**

**Biological factors.** There is a significant literature regarding biological risk factors for depressive symptoms. Although there is little consensus on whether there are “depression genes” or distinct biomarkers to indicate risk for developing depressive symptoms (e.g., Petersen et al., 1993), research consistently indicates familial risk, such that children of depressed parents are at a significantly higher risk of developing depressive symptoms than children whose parents have not experienced depression (Downey & Coyne, 1990; Thapar et al., 2012). Exposure to stress during sensitive periods for the development of brain regions (e.g., prefrontal cortex), could increase vulnerability to depressive symptom development at adolescence and play a role in gender differences for depression that emerge (Andersen & Teicher, 2008).

Changes in the limbic system (e.g., hippocampus) at adolescence may result in increased vulnerability to depression, particularly regarding the activity of neurotransmitters that relate to experiencing pleasure or reward (Davey et al., 2008; Spear, 2000). In particular, research suggests that there is reduced positive incentive value to rewarding stimuli (e.g., reduced serotonin) and higher physiological and hormonal response to stress at adolescence (Spear,
2000). There is also growing evidence for the role of a variant in serotonin transporter gene (5-HTTLPR) that could increase risk of depressive symptom development when exposed to adverse life experiences (e.g., early maltreatment), and these findings are especially pronounced among girls (Caspi et al., 2003; Risch et al., 2009).

Cognitive factors. Cognitive theories of depression (e.g., Abramson et al., 2002; Clark & Beck, 1999; see review by Abela & Hankin, 2008) posit that certain styles of cognitive processing (e.g., perceptions, attitudes, reasoning) may predispose adolescents to risk for depressive symptom development (Hankin, 2006). Theories have identified specific cognitive vulnerabilities for depression, such as a negative inferential style of understanding one’s self and experiences (Abramson et al., 1989), dysfunctional attitudes or beliefs about one’s self and world (Beck et al., 1983), ruminating (i.e., analyzing, rehashing, speculating, dwelling in negative events) or dwelling in negative mood (Nolen-Hoeksema & Morrow, 1993), and self-criticism, or the tendency to view oneself and one’s mistakes as globally indicative of one’s self-worth (Blatt & Zuroff, 1992).

These etiological factors may be particularly salient for adolescent-onset depressive symptoms (Abela & Hankin, 2008), due to cognitive changes that normatively occur at this developmental stage, such as the development of the capacity for formal and abstract thought (Hankin, 2006; Petersen et al., 1993). Adolescents are newly able to think abstractly about their global self and future, and thus, they can become more self-critical and appraise negative experiences differently than before (Turner & Cole, 1994). It is during adolescence that youth are first able to develop negative schemas, which may contribute to depressive symptom development at adolescence, as they begin to cultivate and make meaning of their experiences (Beck, 1983). Most cognitive vulnerability theories describe depressive symptom vulnerabilities on a continuum of severity (Abela & Hankin, 2008) and note the interplay between
vulnerabilities and stressful experiences in one’s environment (i.e., diathesis-stress model; Ingram et al., 1998; Peterson et al., 1993). The combination of greater exposure to stressors and cognitive changes at adolescence could trigger depressive symptom onset and recurrence, particularly among girls (Abela & Hankin, 2008; Hankin & Abramson, 2001).

**Emotional factors.** Given that negative emotions are a central characteristic of depression (Thompson, 1994), etiological theories of emotion and emotion regulation for depressive symptom development have been posited (Durbin & Shaffer, 2008; Yap et al., 2007). Emotion refers to the physiological, neurological, and cognitive arousal that occurs in response to a given situation (Thompson, 1994). Excessive and prolonged experience of negative emotions, such as sadness and shame, may increase the risk for depressive symptom development (Durbin & Shaffer, 2008; Hughes et al., 2011). Although seemingly counterintuitive, emotions linked with positive psychosocial features may also increase risk for depressive symptom development when experienced in excess (i.e., empathetic distress) (Smith, 2015; Zahn-Waxler & Van Hulle, 2011). Emotions are, perhaps, particularly intense for adolescents, as they experience a greater number of daily negative emotions than at other ages (Silk et al., 2003), which may be reflective of hormonal changes and/or changes in capacity for emotion regulation (i.e., strategies used to manage internal and external expressions of emotion) (Thompson, 1994; Zimmerman & Iwanski, 2014).

Emotion regulation strategies can be aimed at suppressing emotion or enhancing/maintaining emotion, which may involve utilization of internal or external resources (e.g., support networks) (Thompson, 1994). Specifically, strategies include passive emotion regulation activities (e.g., avoidance, suppression of emotions) and proactive strategies (e.g., problem-solving). Research suggests that those with and at-risk for depressive symptoms tend to have poor ability to maintain positive affect and to reduce negative affect (Sheeber et al., 2000).
This may be due to ineffective use of emotion regulation strategies in response to negative emotion or a general lack of strategy-use (Garber et al., 1995). For example, some studies document increased use of passive emotion regulation strategies in adolescence, which is typically considered ineffective. Given increased interpersonal stressors and demands during adolescence, there is also growing evidence that poor emotion regulation strategies along with these stressors can generate risk for depressive symptom development, and for adolescent girls in particular (Davila et al., 1995; Yap et al., 2007).

**Interpersonal factors.** Although multiple etiological factors have been identified, the association of interpersonal stressors and depressive symptoms at adolescence has gained particular attention in recent research. The interpersonal theory of depression, developed by Coyne (1976) and elaborated by Hammen (Hammen & Peters, 1978), Rudolph (Rudolph et al., 2000), and Joiner (1999), posits that depression is both influenced by and gives rise to interpersonal problems. In other words, the social interaction style of depressed individuals elicits negative social responses, which in turn increases risk for maintaining depressive symptoms in a cyclical manner (Hames et al., 2013). Dysfunctional interpersonal experiences may also be an indication of ineffective coping with interpersonal stress, or a means of seeking support from others in maladaptive ways (Coyne, 1976; Hames et al., 2013). As such, this etiological theory may be bidirectional in nature (Hammen, 2009).

Although this theory aims to address chronicity of depressive symptoms for all depressed individuals (Hames et al., 2013), it may be particularly important to consider at adolescence. Low parent or family support is a consistently identified risk factor for depressive symptoms (Beever et al., 2007). Research further suggests an interaction of environmental risk factors, such as parent behavior, with genetic risk for depression (Lau & Eley, 2009). Parents with depressive symptoms contribute genetic risk and also have been observed to exhibit impaired
parenting, creating a less warm, supportive environment (see review by Downey & Coyne, 1990). Studies show that depressed parents are less interactive with their children, make less eye contact, and are more irritable, all of which likely contribute to children’s symptomology. Additionally, adolescents with genetic risk appear to have higher likelihood of depressive symptom development when exposed to other psychosocial stressors (e.g., interpersonal victimization), particularly among girls (Thapar et al., 2012), and are, unfortunately, at a continuously higher risk of exposure to these psychosocial factors across their lifetime (e.g., Brendgen, 2012).

Additionally, the increased presence and demand to navigate interpersonal stressors increases at adolescence (Davila et al., 1995) as peer relationships become increasingly central (Collins, 2003). Social isolation, rejection, lack of support and other forms of stressful experiences with peers may be particularly influential for depressive symptom development, including with friendship and romantic experiences (Davila, 2008; Davila et al., 2009b; Hammen, 2009). Notably, these contexts tend to be relatively stable and may contribute not only to onset but also to recurrence of depressive symptoms (Hammen, 2009).

Scholars have expanded interpersonal theory of depression to address gender differences in susceptibility to depressive symptoms development (Hammen, 2003; Hankin & Abramson, 2001). Specifically, it is posited that there are unique social challenges for adolescent girls, and that they may have more exposure and reactivity to stressors, particularly those stressors that are interpersonal in nature (Hammen, 2009). Moreover, it is well-documented that girls are generally more attuned to interpersonal experiences as compared to boys, which some argue to be due to evolutionary or societal expectations. Some work also suggests that there are gender differences in coping strategies used to address social stress and depressed mood, such that girls endorse ruminating more than boys, which could extend exposure to negative affect and ultimately
prolong symptoms (Nolen-Hoeksema, 2000; Rudolph, 2009). In contrast, boys report taking active or distracting approaches to negative mood and social stress, which may successfully alleviate negative mood (Nolen-Hoeksema, 2000). Further, it is possible that girls simply encounter more stressful social situations on average (e.g., sexual abuse) that increases their reactivity to such interpersonal problems (Rudolph, 2002).

**Depressive Symptoms and Romantic Relationships**

Consistent with interpersonal theories of depression, a growing literature highlights the association between multiple aspects of romantic relationships and depressive symptom development during adolescence (Davila, 2008; Joyner & Udry, 2000). First, research dedicated to partner characteristics indicates that romantic partners tend to be similar to one another in regards to depressive symptoms (Ha et al., 2014), but little research has expanded beyond this homophily finding. A larger number of studies have been dedicated to understanding the bidirectional association between depressive symptoms and features of adolescent romance (i.e., involvement, content, and quality) (e.g., Ha et al., 2014; Vujeva & Furman, 2011). Studies examining this association are reviewed below. Following this review of empirical findings, theoretical models that propose frameworks for understanding the mechanisms behind these basic associations are reviewed.

**Involvement.** In one of the earliest studies on the topic, Joyner and Udry (2000) analyzed a nationally representative sample of adolescents and found an association between romantic involvement and increased depressive symptom development one year later. Specifically, analyses suggested that both girls and boys who became involved in heterosexual romantic relationships experienced greater increases in depressive symptoms, and this association was especially strong for younger romantically-involved girls. Although a majority of studies in this area have replicated this finding (Compian et al., 2004; Davila, 2008; Davila et al., 2004; Ha et
al., 2014), some have suggested that only the negative experiences associated with dating (e.g., conflict), rather than mere romantic involvement itself, was predictive of depressive symptom development (La Greca & Harrison, 2005).

Additionally, romantic relationship dissolution is reliably identified as a trigger for a first depressive episode at adolescence (Joyner & Udry, 2000; Monroe et al., 1999). Factors such as degree of distress and closeness of the partnership may impact the strength of the association (Monroe et al., 1999). Conversely, there is also evidence to suggest that formerly depressed youth are at a higher risk of breakups, suggesting that those with elevated depressive symptoms may encounter more stressful interpersonal situations that may lead to breakups. However, some studies indicate that relationship dissolution does not predict recurrent episodes above and beyond other factors, such as a previous episode (Hammen, 1991; Monroe et al., 1999).

**Content.** Sexual experiences in the romantic context also appear to be associated with risk for depressive symptom development (Compian et al., 2004; Davila et al., 2009a). This association has been documented across a wide range of sexual behaviors, from attraction or flirting to sexual intercourse (Davila, 2008). The literature consistently shows gender and age differences in this association, such that girls and younger adolescents who are sexually active are at a greater risk for depressive symptom development than males or older adolescents (Starr et al., 2012; Welsh et al., 2005; Welsh et al., 2000; Whitbeck et al., 1999). Still, this association may be influenced by factors such as relationship quality and length of partnership (Shulman et al., 2009). Studies have found that the association between depressive symptoms and sexual activity is strongest among adolescent girls who engage in sexual activity within casual and/or brief romantic experiences (Grello et al., 2003), and this association persists into emerging adulthood (Furman & Collibee, 2014). In contrast, there is evidence to suggest that sexual behavior within a romantic relationship is positively associated with increased feelings of self-
worth and decreased depressive symptoms in early adulthood, perhaps due to improved relationship quality (Furman & Collibee, 2014).

Additionally, physical or emotional abuse in dating relationships is associated with concurrent depressive symptoms (Holt & Espalage, 2005) as well as with the development of depressive symptoms across adolescence (Foshee et al., 2004) and into adulthood (Exner-Cortens et al., 2013). Research has further suggested that the presence of depressive symptoms is a risk factor for dating victimization (Foshee et al., 2004) and dating violence perpetration (i.e., sexual violence and physical violence; Vagi et al., 2013). This fits with other empirical support that having depressive symptoms may heighten adolescents’ vulnerability to interpersonally distressing situations.

**Romantic relationship quality.** Although there are significantly fewer studies regarding the association between depressive symptoms and relationship quality than romantic involvement or content (Vujeva & Furman, 2011), existing studies suggest that quality of adolescent romantic relationships is associated with depressive symptoms. For example, in a study of high school students, La Greca and Harrison (2005) found that negative qualities in romantic relationships were concurrently associated with depressive symptoms above and beyond other peer relations experiences or the qualities of best friendships. Moreover, depressive symptom development was not predicted by romantic involvement alone, suggesting that the presence of negative interactions, stress, and poor quality increased risk, which fits with other studies (e.g., Davila et al., 2004; Kansky & Allen, 2018). Given that the quality of friendships and the quality of other peer relationships tend to be highly related, this finding indicates that poor romantic relationship quality has a unique influence on depressive symptoms.

As previously described, conflict in romantic relationships may present significant challenges for adolescents due to the demand on emotion regulation skills (Collins et al., 2009;
Ha et al., 2014). Negative emotional reactions to conflict and poor conflict resolution, which are both common among young adolescent couples (e.g., Furman & Shomaker, 2008), may increase vulnerability to depressive symptoms. Interestingly, some observational studies indicate more positive expressions between young adolescent couples when discussing conflict, including more smiling and expressed affection (Furman & Shomaker, 2008; Ha et al., 2014). Although this may seem to suggest a positive tone or even a protective effect, these positive expressions may instead be reflective of adolescents’ avoidance of conflict. Those with depressive symptoms may also experience increased interpersonal challenges and contribute to a romantic relationship of poorer quality, suggesting a bidirectional association (Starr et al., 2012). Perhaps due to the attunement to interpersonal stress, many studies suggest that this association is stronger for females (Ha et al., 2014).

**Davila’s (2008) Conceptualization of Mechanisms in the Association between Depressive Symptoms and Romantic Relationships**

Although there is clear evidence to support that depressive symptoms and adolescent romantic relationships are associated, and this evidence rests on interpersonal theories of depression, the mechanisms of this association remain poorly understood. In a review of the literature, Davila (2008) thoroughly examined theoretical models aimed at explaining the association from a biological and/or social lens and identified empirical studies to support each model. Through this article, she put forth a helpful and sophisticated theoretical conceptualization of the current literature.

First, Davila (2008) described the normative trajectory model. First developed by Connolly and Williams (2000) and others, the normative trajectory model states that developmental timing of romantic behavior drives maladjustment. For example, youth who develop romantic relationships marked by high intimacy and sexual activity in early adolescence
are at an increased risk for depressive symptom development (Welsh et al., 2005; Whitbeck et al., 1999). Another model, which Davila (2008) describes as the attention impairment model, suggests that involvement in romantic relationships may reduce attention toward other important activities (e.g., school, friends). From this perspective, less attention toward these areas leads to dysfunction in many areas and ultimately depressive symptom development (Joyner & Udry, 2000). However, given evidence that the association between depressive symptoms and romance appears to persist into older adolescence (e.g., Davila et al., 2004) and that the model of inattention has not received much empirical support (Davila, 2008), neither of these models appears to fully explain the association.

Additionally, Davila (2008) outlines theory that individual differences in interpersonal functioning, such as differences in attachment style, may influence vulnerability to depressive symptoms through romantic relationships. This fits with attachment theory, which posits that individuals have working models of intimate relationships that guide how they behave, interpret interactions, and respond emotionally in relationships (Bowlby, 1969, 1973, 1980). Patterns of attachment, developed with primary attachment figures in infancy, can be secure (i.e., trust in attachment figures) or insecure (i.e., preoccupied by fear of rejection; avoiding or dismissing of attachment figures). There is research to suggest that having an insecure attachment style heightens vulnerability to romantic stress and depressive symptom development (Davila et al., 2004). Moreover, differences in rejection sensitivity are also linked with attachment style and appear to have a strong association with depressive symptom development (Downey et al., 1998; Harper et al., 2006).

Davila (2008) further describes the stress and coping model, which has received increased attention and empirical support in recent years. This model posits that the unique stress and emotional intensity of romantic relationships is challenging to most adolescents, but may be
particularly difficult to manage for those with insufficient coping resources. Research continually suggests that negative experiences and depressed mood are endorsed more often by dating girls than non-dating girls or boys (Larson et al., 1999; Natsuaki et al., 2009), which appears to be primarily driven by content and quality of the romantic relationship (e.g., conflict, breakups). Youth have varying levels of available coping resources (e.g., positive support systems) to manage emotions and effectively problem-solve stressful romantic situations (Compas, 1987; Davila, 2008; Starr et al., 2012).

Indeed, there are studies to suggest that romantically-involved youth are at a significantly increased risk of depressive symptom development in the absence of parent support (Steinberg & Davila, 2008), and perceived parent support tends to decrease at this age more generally (Furman & Buhrmester, 1992). Additionally, a small but compelling literature has elucidated a link between youth’s engagement in maladaptive support-seeking behavior with friends and depressive symptom development, especially for those in romantic relationships (Starr & Davila, 2008). Research has not yet examined the role of friend support in why this association might exist (Davila, 2008). Given that friends are even more important at this developmental stage, this may be an area of salience (Brendgen et al., 2002; Feiring, 1999). As such, it is important to understand not only the features of adolescents’ romantic partnership (i.e., relationship status, partner characteristics, content, quality), but also the presence and utilization of other types of social support, such as adolescents’ friendships, to navigate romantic challenges, as will be explored in the current study.

The Role of Friendships in Managing Romantic Problems

Friendships at Adolescence

At the same time that the challenges of managing romantic experiences emerge and risk for depressive symptom development increases, adolescents are also navigating the broader
context of peer relationships such as peer groups and friendships (Feiring, 1999). In early childhood, peer acceptance (i.e., the degree to which children are generally liked or disliked by their peers) is of central importance (Newcomb & Bagwell, 1995). Peer acceptance is typically measured using sociometric nomination methodology, in which children nominate peers regarding whether they are liked or disliked. More specifically, results from this method distinguishes children who are accepted (many nominations of being liked), rejected (many nominations of being disliked), or neglected (lack of nominations) (Bukowski et al., 1993). These methods can also be used to determine children’s social network, reflecting friendship ties (Hartup, 1996). Status among peers can be predictive of socioemotional and academic adjustment, among other things (e.g., Brendgen et al., 2002; Pedersen et al., 2007).

From within peer groups, dyadic friendships form (Newcomb & Bagwell, 1995). Unlike other kinds of peer relationships, such as classmates, friendships are typically considered to be the first form of voluntary, reciprocal interpersonal relationship. Although presence of friendships can be associated with status among peers, they are not redundant (Vandell & Hembree, 1994). Although they can be identified as young as in childhood (Howes, 2009; Nangle et al., 2003), it is well-established that close dyadic friendships become increasingly salient at adolescence (e.g., Buhrmester, 1990; Bukowski et al., 1993; Dumont & Provost, 1999; Waldrip et al., 2008). This is perhaps due to youth spending greater time at school with peers and subsequently less time with parents or caregivers (Buhrmester, 1990), and this differentiation from parents reflects one way in which youth build increasing autonomy. Moreover, compared to other types of peer relationships, studies show that friendships tend to be marked by strong feelings of liking and knowing, as well as feelings of balance or equality (Newcomb & Bagwell, 1995).
As Sullivan’s (1953) interpersonal theory first posited, friendships become a growing source of support and intimacy at adolescence (Bukowski et al., 1993; Connolly et al., 2000; Feiring, 1996; Furman & Wehner, 1994; Hartup, 1999). Youth describe greater need for emotional support, genuineness, and trust in friendships as they grow older (Buhrmester, 1990; Way & Greene, 2006). Additionally, while young children’s friendships tend to be marked by shared activities and play, adolescent friendships often involve more support-seeking behavior, oftentimes in the context of self-disclosure with friends (Hartup, 1993). Specifically, theory and research suggest that self-disclosure becomes more common at adolescence as more salient social issues arise, as a means of gaining social input, support, and closeness (Buhrmester & Prager, 1995). This reflects a shift toward desire for and development of high quality friendships in adolescence compared to childhood. Indeed, the literature suggests that perceived quality of friendships, an element of which is intimacy, improves from middle to late adolescence (Newcomb & Bagwell, 1995).

According to developmental tasks theory, navigating friendships is the most central interpersonal developmental task at adolescence (Hartup, 1999; Roisman et al., 2004) due to the lengthy experience most youth have with friendships by this time (Roisman et al., 2004). Numerous studies support the benefits of friendship for socioemotional development in adolescence and into adulthood (Bagwell et al., 1998; Bukowski et al., 1993; Roisman et al., 2004), while those who do not establish healthy friendships have increased risk for behavioral and emotional problems into adulthood (Bukowski et al., 1993; Narr et al., 2019; Parker & Asher, 1987). Furthermore, developing stable friendships in adolescence appears to set the stage for the most salient developmental task of adulthood: development of romantic relationships (Collins & Laursen, 2000; Roisman et al., 2004).
Many aspects of friendship appear to contribute positively to youths’ emotional adjustment. These aspects include intimacy, mutual liking, and support, born out of time spent together and normative self-disclosure (Berndt, 1992; Buhrmester & Prager, 1995; Furman & Wehner, 1994). Given that friendships, romantic relationship formation, and risk for depressive symptom development all appear to interact, it follows that friendships may play a prominent role in coping with romantic challenges at adolescence. This section details various aspects of friendship, how they are measured, their associations with positive adjustment, and their potential role in managing romantic challenges.

**Measuring Dimensions of Friendship**

**Number of friends.** Studies on friendship and adjustment predominately focus on measuring presence of friendships and the qualities of friendship (Bukowski et al., 1993; Hartup, 1996; Sullivan, 1953). Identifying friendships is typically assessed through sociometric friendship nominations, during which researchers ask youth to identify their friends (e.g., three; up to 10; an unlimited number). Number of friendships may be determined from unilateral nominations (i.e., the number of friends nominated by target youth; e.g., Starr & Davila, 2008), reciprocal nominations between a friendship dyad, also considered a mutual friendship (e.g., Brendgen et al., 2013; Waldrip et al., 2008), or both (e.g., Giletta et al., 2012). Moreover, researchers may choose to analyze youths’ identified “best” or closest friendship, specifically, as compared to their “good” friends (Nangle et al., 2003). Researchers also note that asking youth to report the length of a friendship may be important to measure; however, research suggests that length of friendships is not always indicative of the strength of the friendship or associated outcomes (Furman, 1996).

**Quality of friendships.** Measurement of friendship qualities is also common and reflects an important means of understanding friendships in greater depth (Bukowski et al., 1993).
Friendships can be described as having many qualities, some of which are considered positive (e.g., security, closeness, support, provision of help) or negative (e.g., conflict) (e.g., Bukowski et al., 1993; Furman & Buhrmester, 1985). A low-quality friendship could be characterized by the presence of negative qualities (e.g., conflict), low ratings of positive qualities (e.g., support, conflict resolution), or both whereas a high-quality friendship is indicated by presence of positive features and/or the lack of negative features (Furman, 1996). Measures of friendship quality typically result in an individual score for one or both persons in a friendship dyad, focusing on description and perception of the relationship between individuals (Bukowski et al., 1993; Furman, 1996). Observational and interview methodologies have been developed to measure friendship quality, but empirical studies more often utilize self- and friend-report questionnaires. Although this may seem to be a limitation, many argue that self- and friend-reports are a fundamental way to assess youths’ own perceptions of their relationship to understand how the relationship influences emotional adjustment (Bukowski et al., 1994; Furman, 1996).

For example, as previously described, the NRI (Furman & Buhrmester, 1985) can be used to measure many attachment relationships, including self-reported romantic relationship quality and friendship quality. Parallel to the romantic relationships version of the measure, this instrument assesses perceptions of reliable alliance, instrumental help, intimacy, conflict, and conflict resolution among other features of the friendship (Furman, 1996). This measure can be administered to both partners in a friendship dyad to better understand mutuality and reciprocal nature of the relationship (Furman, 1996). However, while some studies use target youths’ perceptions of quality for analyses (e.g., Burhmester, 1990; Connolly et al., 2000), others use friends’ reports (e.g., Schwartz-Mette & Rose, 2009), and still others combine reports from youth and their friends as an integrated index of quality (e.g., Prinstein et al., 2005). It is not
uncommon for ratings of friendship qualities to differ according to each friend in the dyad, suggesting that relationships can be differently perceived.

Provisions of Friendship and Links with Emotional Adjustment

Theory suggests that adolescent friendships have particular provisions for adolescents (Buhrmester, 1990). As previously indicated, Sullivan (1953) theorized that the collaborative, mutual nature of friendships contributes to a greater level of intimacy than do peer group relationships. Perhaps due to the fact that close friendships tend to be characterized by familiarity, understanding, and affection (Newcomb & Bagwell, 1995), it is expected that friends seek to meet one another’s needs. Adolescent friendships are expected to contribute to the development of social competency, including perspective-taking skills (Buhrmester & Furman, 1986) as well as self-worth (Berndt, 2004; Newcomb & Bagwell, 1995). Additionally, it is expected that friendships involve positive engagement, which may consist of play, cooperation (e.g., sacrificing one’s need for another), and talking, which could be beneficial for one’s development and for building competencies central to future development (Hartup, 1993).

Number of friends. Generally, having friends has distinct benefits for adolescent development (Newcomb & Bagwell, 1995). Specifically having one or more friends is thought to provide youth with opportunities to build social skills, and can increase perceived acceptance, as well as self-esteem (Kistner et al., 1999). Although some scholars have argued that both unilateral and reciprocal friendships may be important indices to examine when testing links with adolescent adjustment (e.g., Berndt & McCandless, 2009), others assert that reciprocated friendships play a stronger role than unilateral friendships in impacting adolescent adjustment (Bukowski et al., 1993). Studies have demonstrated that lack of friendships (both unilaterally and reciprocally defined) may be associated with increased feelings of loneliness (e.g., Lodder et al., 2017; Nangle et al., 2003) as well as depressive symptoms (e.g., Nangle et al., 2003). Friendship
quantity has a negative association with depressive symptoms, such that with more friends, youth present as having fewer depressive symptoms. This association has been evidenced both concurrently (e.g., Brendgen et al., 2013) and longitudinally, with number of friends being both predictive of and predicted by depressive symptoms (e.g., Giletta et al., 2011; Giletta et al., 2012).

Interestingly, however, studies have consistently demonstrated that youth may not need to have many friends to reap benefits (e.g., Berndt, 2004; Brendgen et al., 2013). Indeed, having even one friendship appears to be protective against the development of psychopathology (Hartup, 1996; Hodges et al., 1999; Nangle et al., 2003). For example, Brendgen and colleagues (2013) examined the role of number of friends and genetic risk factors in predicting depressive symptom development in a large sample of adolescent twins. Findings indicated that having at least one reciprocal friend predicted lowered depressive symptoms for girls, even when considering genetic risk factors.

**Quality of friendships.** Like romantic relationships, many features of high quality friendships can be provisions in and of themselves. Friendships high in perceived support and intimacy have associated socioemotional benefits, such as higher self-esteem and problem-solving skill development (Berndt, 2004; Brendgen et al., 2013; Buhrmester, 1990; Waldrip et al., 2008). Additionally, friendships that involve sharing, problem-solving, and instrumental aid have been linked with positive cognitive development (Newcomb & Bagwell, 1995), perhaps due to their inherent link with perspective-taking.

As indicated by Sullivan’s (1953) theory, self-disclosure (i.e., sharing personal thoughts, feelings or experiences with another person; Buhrmester & Prager, 1995) in adolescent friendships may be a particular provision. Disclosures, as an exchange of personal information, elicit feelings of closeness. In fact, researchers and theorists posit that a primary function of self-
disclosure is to foster relationship formation (e.g., Aron et al., 1997) as a means of establishing intimacy, autonomy, and individuation (Buhrmester & Prager, 1995). Specifically, self-disclosure elucidates points of similarity and distinctions between friends. As adolescents strive to discover more about themselves and establish their identity, one can reasonably see how self-disclosure in friendships may be particularly central to adolescence.

Importantly, a number of studies indicate that high quality friendships are linked with benefits for emotional adjustment, including depression (for review, see Schwartz-Mette et al., 2021). In particular, a concurrent association between friendships and depressive symptoms is well-documented (e.g., Aoyama et al., 2011; Brendgen et al., 2013; Peltonen et al., 2010), and there is growing empirical support to suggest that friendship quality is predictive of depressive symptom development (e.g., Oldenburg & Kems, 1997; Oppenheimer & Hankin, 2011) and vice versa (e.g., Buck & Dix, 2012; Kamper & Ostrov, 2013). A similar association is documented between perceived friendship support and depressive symptoms (e.g., Frison et al., 2016; Slavin & Rainer, 1990; Windle, 1992). In contrast, studies support that friendships marked by negative qualities (e.g., high conflict) are associated with greater increases in depressive symptoms (e.g., Borelli & Prinstein, 2006; Oppenheimer & Hankin, 2011; Prinstein et al., 2005).

**Gender differences.** There is a significant amount of research to support gender differences in the features and provisions of friendships, as well as in the associations of friendship features with emotional adjustment. In particular, girls appear to rate their relationships as closer and more intimate than boys do, and this discrepancy is particularly present in early adolescence (Furman, 1996; Sullivan, 1953). Researchers have posited that this may be because girls are more keenly attuned to social experiences and relationship maintenance (Feiring, 1999). The quality and content of girls’ friendships also appear to differ; girls appear to self-disclose in friendships more than boys (Buhrmester & Prager, 1995; Rose & Rudolph,
2006), while boys more often engage in shared activities (Furman, 1996; Rose, 2007). This trend is consistent from a young age, and intensifies at adolescence (Buhrmester & Prager, 1995). Generally, this may reflect gender differences in the ways in which boys and girls seek intimacy and is likely rooted in and reinforced by societal expectations for girls to be more interpersonally focused (Furman, 1996). Interestingly, some studies suggest that these differences are less stark in late adolescence, as boys demonstrate a sharp increase in perceived closeness and quality of their same-gender friendships (Azmitia et al., 1998; Way & Greene, 2006). Less has been documented in regards to gender differences in number of friends or negative friendship quality, suggesting that these experiences are similar for boys and girls (Bukowski et al., 1993; Rose, 2002).

Additionally, gender differences have been examined in the associations between features of friendships and emotional adjustment, including depressive symptoms (Schwartz-Mette et al., 2020). Results of investigations regarding these friendship features and depressive symptoms have been less consistent. For instance, studies regarding quantity of friends and depressive symptoms seldom reflect gender differences (e.g., Giletta et al., 2011). Moreover, few differences as a function of gender have been documented for the associations between negative quality and depressive symptoms (e.g., Lavallee & Parker, 2009). Although some studies have revealed gender differences in support and depressive symptom development (e.g., Allen et al., 2007; Bukowski et al., 1993; Rose, 2002), others have found that the association is similar for boys and girls (e.g., Rose et al., 2011).

Of note, theoretical models have focused on same-gender friendship (Collins & Laursen, 2004), and the empirical literature also reflects this trend. As such, few studies have measured associations of participation in cross-gender friendships and emotional adjustment in adolescence. Those that do have posited that cross-gender friendships may be indicative of a
different type of relationship than same-gender friendships among heterosexual youth (Collins & Laursen, 2004). This is likely linked to heterosexual romantic exploration that often occurs in peer groups at this stage. The lack of theoretical or empirical support for cross-gender friendship measurement may limit our understanding of the nuances of friendships, perhaps especially for non-heterosexual youth.

Given the provisions of having friends, and particularly friendships characterized by positive features, friendships may be helpful for navigating the stresses of romantic relationships during adolescence (Davila, 2008; Szwedo et al., 2015). Normative increases in intimacy in friendships coincide with increased involvement in romantic relationships (Steinberg & Silk, 2002). Friends, as a growing source of social support and acceptance, are often a source to navigate personal challenges and disclose intimate information (Buhrmester & Prager, 1995; Szwedo et al., 2015). What is more, studies have demonstrated that teens are more likely to turn to friends than parents regarding matters of romance and sexuality, perhaps due to the sensitive nature of many romantic challenges (Buhrmester & Furman, 1986). As such, presence and quality of friendships may be an important area to examine as they relate to romantic stress and risk for depressive symptom development. The current study focuses on friendship quality and its role in coping with adolescents’ romantic stress.

Friendships and Tradeoffs for Emotional Adjustment

Yet, not all outcomes of friendships are positive. For example, certain types of friendships and friendship processes have been shown to facilitate engagement in deviant behavior, including substance use and criminal behavior (e.g., Dishion & Owen, 2009). Additionally, although support, intimacy, and disclosure are cited as indicators of positive emotional adjustment, there is recent nuanced research that reveals trade-offs for certain types of disclosure and support-seeking behavior with friends, as a so-called “dark side” to adolescent
friendships (Vitaro et al., 2009). For example, co-rumination, one interpersonal behavior that involves both disclosure and support-seeking, occurs commonly at adolescence and is associated with both positive and negative implications for adolescents’ wellbeing (Rose, 2002). This aspect of friendship will be discussed in further detail below given its central role in the current study, as it pertains to friendships, depressive symptom development, and romantic experiences, especially among girls.

**Co-rumination, Friendships, and Romantic Relationships at Adolescence**

**Co-rumination and Friendships**

First established by Rose (2002), co-rumination is defined as the cyclical and excessive discussion of problems in a dyadic relationship. Specifically, co-rumination involves speculation and rehashing of problems in a way that is excessive, mutually encouraged, and negatively focused (Rose et al., 2007). Importantly, co-rumination is described to share core features with self-disclosure (Rose, 2002; Schwartz-Mette, & Rose, 2012), such that they both involve sharing of thoughts, feelings, and experiences and facilitate a feeling of closeness. However, self-disclosure differs from co-rumination as it is not always problem-focused nor perseverative and may include discussion of positive affect (Buhrmester & Prager, 1995).

**Measurement.** Co-rumination is typically measured with the Co-Rumination Questionnaire (Rose, 2002), a widely-used, reliable, and well-validated self-report measure aimed to capture perceived engagement in the aspects of co-rumination with close friends. Designed by Rose (2002), this questionnaire consists of 27-items, specifically aimed at uncovering the extent to which the respondent co-ruminates with same-gender friends (e.g., *When we talk about a problem one of us has, we try to figure out everything about the problem, even if there are parts that we may never understand.*). Each item is rated on a Likert scale, ranging from 1 (*not at all true*) to 5 (*really true*). Measure items have demonstrated excellent
reliability (Cronbach’s α = .96) (Rose, 2002; Rose et al., 2007; Tompkins et al., 2011).

Additional information on the validity of the co-rumination measure is included in the following section.

More recently, the Problem Talk Task was developed and validated as a task to elicit co-rumination (Byrd-Craven et al., 2008), and an observational coding system for co-rumination was established using this paradigm (Rose et al., 2014). First, friends join one another in a room with video recording equipment and engage in a brief warm-up task (e.g., planning a party together). Friends are then separated and asked to identify a problem they are currently experiencing. They are reunited in the observation room and are instructed to talk about each friend’s problem for as long as they desire for up to 16 minutes. They are also told that they may discuss another topic, or play with a puzzle that is on the table if they would like.

Videotaped interactions can then be transcribed and coded for microsocial aspects of co-rumination including 1) rehashing, 2) mutual encouragement, 3) dwelling on negative affect, 4) speculation, and 5) time spent discussing problems (Rose et al., 2005; Rose et al., 2014). Reliability of such codes are excellent in past studies, with intraclass correlations (ICC) ranging between 0.82-0.97 (Byrd-Craven et al., 2008; Rose et al., 2014). Scores for each of the five aspects of co-rumination are standardized, then combined to assign a global co-rumination score to the dyad, reflecting their overall engagement in co-rumination. Consistent with previous studies of self-reported co-rumination (e.g., Calmes & Roberts, 2008; Hankin et al., 2010; Rose, 2002) observed co-rumination codes are associated with friendship quality and closeness and with internalizing symptoms (Rose et al., 2014).

Many investigations support the validity of the self-report Co-rumination Questionnaire. For instance, studies have shown that, as expected, self-reported co-rumination is associated with self-disclosure (Rose, 2002). Moreover, self-reported co-rumination is reliably linked to positive
friendship quality and support (Byrd-Craven et al., 2011; Rose, 2002; Rose et al., 2007; Rose et al., 2014; Smith & Rose, 2011) and internalizing symptoms, including depressive symptoms (e.g., Rose, 2002; Rose et al., 2007; Stone et al., 2011; Tompkins et al., 2011; see also discussion below). In regards to discriminant validity, studies have demonstrated nonsignificant associations between most subscales of the Co-rumination Questionnaire and unrelated constructs, such as distraction (Davidson et al., 2014). The construct of co-rumination also overlaps with rumination, or repetitively and passively thinking about negative content in response to distressing situations (e.g., Nolen-Hoeksema et al., 2008). Specifically, both refer to a perseverative focus on problems that are associated with increased depressive symptoms, but co-rumination is a dyadic, interpersonal conversation style (Rose et al., 2007).

Research findings support that co-rumination occurs most often in adolescent female friendships, anywhere between early (e.g., 12 years) and late adolescence (i.e., college-age) (Calmes & Roberts, 2008; Rose, 2002). Of note, studies of co-rumination most often focus on same-gender dyads (Rose et al., 2014) and most typically include adolescent samples, with only a few examining the occurrence among adults (e.g., Barstead et al., 2013).

**Co-rumination and positive friendship quality.** As previously noted, co-rumination is consistently associated with features of high-quality friendships, such as closeness, intimacy, and support (Byrd-Craven et al., 2011; Rose, 2002; Rose et al., 2007; Rose et al., 2014; Smith & Rose, 2011). This is expected, given that sharing and consulting about problems can prompt feelings of intimacy, and indicates co-rumination as overlapping with self-disclosure (Buhrmester & Prager, 1995). Perhaps co-rumination leads to the perception that friendships are high quality in that there is social sharing involved and the evocation of empathy from a listening partner (Smith & Rose, 2011).
Studies have demonstrated concurrent associations between friendship quality or closeness and both self-reported (Rose, 2002) and observed co-rumination (Byrd-Craven et al., 2011; Rose et al., 2014). Moreover, this association has been documented longitudinally. For example, Rose and colleagues (2007) found that adolescents who reported higher levels of engagement in co-rumination had increased friendship quality 6 months later, and that this, in turn, predicted more co-rumination. This suggests that there is a reciprocal association between positive friendship qualities and co-rumination, perhaps indicating that co-rumination is part of one’s perceived support-seeking and giving.

Importantly, the link between co-rumination and positive friendship quality, concurrently and over time, is documented for both boys and girls (Rose, 2002; Rose et al., 2007). Although girls tend to report higher engagement in co-rumination (Rose, 2002), report higher quality friendships on average, and show greater social perspective-taking skills, which are associated with co-rumination especially among older adolescents (Smith & Rose, 2011), it appears that the link between co-rumination and friendship quality can have similar benefits across female and male adolescents. Interestingly, at least one study has demonstrated that, although girls engage in more co-rumination and have stronger friendships on average, there was a stronger association between co-rumination and friendship quality among boys (Rose, 2002). It is possible that this is due to the fact that it is less normative for boys to have high disclosure of their problems; thus, when it occurs, it is indicative of a stronger relationship.

**Co-rumination and depressive symptoms.** However, co-rumination is also associated with emotional maladjustment tradeoffs, including increased emotional and physiological arousal (e.g., Byrd-Craven et al., 2008; Byrd-Craven & Granger, 2011) and risk for internalizing symptoms (Rose et al., 2007). Specifically, there is compelling research documenting the association between co-rumination and depressive symptoms among adolescent girls (Rose,
Studies have indicated that engaging in co-rumination is associated with increases in concurrent depressed mood (White & Shih, 2011), and the development of depressive symptoms over time (e.g., Hankin et al., 2010; Rose, 2002; Stone et al., 2011). Research suggests that co-rumination may even facilitate a process of contagion between youth, such that adolescents who spend greater time discussing problems in a perseverative manner with a depressed friend are more susceptible to depressive symptoms themselves, particularly among girls (Schwartz-Mette & Rose, 2012).

Moreover, studies have demonstrated that depressive symptoms may in turn predict co-rumination among girls (Hankin et al., 2010; Rose et al., 2007). In line with theories posited by Coyne (1976) and others (e.g., Hammen, 1992, 2006), interpersonal theories of depression would suggest that co-rumination may be a maladaptive way of seeking social support when managing distress. It is possible that co-rumination may be a conversational style that is commonly adopted by depressed youth due to their perception of having a multitude of problems, and interest in seeking support. Unfortunately, however, this behavior appears to amplify negative emotions and distress, and can lead to greater depressive symptom development; said differently, the association appears to be bidirectional in nature (Hankin et al., 2010).

Co-rumination is posited to be a mechanism of gender differences in rates of depression (Hankin et al., 2010; Rose, 2002; Rose et al., 2007; Starr & Davila, 2009; White & Shih, 2011). In fact, in a two-year longitudinal study of adolescents, Stone and colleagues (2011) found that engagement in co-rumination not only predicted the onset of depressive episodes, but also mediated the association between gender differences and onset of depressive symptoms. These findings remained even when considering baseline depressive symptoms and rumination, which is suggestive of co-rumination’s unique influence. What is more, the documented tradeoffs of co-rumination may impact adolescent girls exclusively, such that girls have associated risk for
depressive symptom development from engagement in co-rumination (Rose et al., 2007). As such, co-rumination is an exemplary phenomenon to examine when considering adolescent girls’ depressive symptom development and chronicity.

**Co-rumination and Romantic Experiences**

**Romantic problem-talk.** Given the problems associated with first romantic experiences at adolescence (e.g., Nieder & Seiffge-Krenke, 2001), as well as increased self-disclosure and support-seeking with friends (e.g., Furman & Buhrmester, 1985), it follows that youth turn to friends to manage romantic problems (Seiffge-Krenke, 2011). Indeed, although parents can be a source of support, the literature indicates that adolescents self-disclose more to friends than parents (Buhrmester & Prager, 1995), especially regarding romantic experiences (Nieder & Seiffge-Krenke, 2001; Steinberg & Silk, 2002). This is unsurprising due to the nature of romantic relationships. Despite some theory and research to suggest that romantic involvement may reduce time spent with friends, particularly when youth are in exclusive relationships (Furman et al., 2009), there is more evidence that friends are the central source of support for romantically-involved youth to manage a variety of problems associated with romantic relationships (Connolly et al., 2000; Nieder & Seiffge-Krenke, 2001; Zimmer-Gembeck, 2002). For instance, youth appear to rely on friendships to manage problems related to romantic relationship formation (Seiffge-Krenke, 2011). Especially during early adolescence, not only are there more opportunities for romantic relationship formation within peer groups (Feiring, 1999), but also friends appear to play a role in facilitating romantic relationships. Studies have found that communication of first romantic interest and even coordinating of dates are commonly facilitated through friends, particularly at early adolescence (Nieder & Seiffge-Krenke, 2001).

Moreover, young adolescents endorse turning to friends to discuss romantic challenges rather than their romantic partner. Seeking friends’ intervention and support to manage romantic
problems is, perhaps, a means of buffering overwhelming emotions and fear of rejection (Nieder & Seiffge-Krenke, 2001; Zimmer-Gembeck, 2002). There is some research to suggest that whether youth cope with these overwhelming emotions related to romantic experiences with friends in an effective way, and perceive their friendships to be stable, may play a role in whether depressive symptom development ensues (Chow et al., 2015; Szwedo et al., 2015).

Moreover, talking to friends about romantic problems appears to remain a strategy for managing romantic problems across adolescence, despite normative developmental shifts that occur. For example, a longitudinal study of adolescents between 14 and 17 years old examined the typical problems experienced by adolescents, the quality of relationships over time, and how youth coped with romantic problems (Nieder & Seiffge-Krenke, 2001). Consistent with previously reviewed literature, intimacy and quality of romantic relationships appeared to gradually improve across adolescence. Findings further suggested that younger adolescents reported most often managing romantic problems with friends, often regarding formation of relationships and maintaining status among peers. Along with managing problems within the romantic relationship, older adolescents also reported managing problems with friends as a common strategy; they often described their problems to relate to maintaining high quality romantic relationships.

Other studies have indicated that the quality of friendships (along with romantic relationship quality itself), appear to influence problem-solving in romantic relationships (Linder & Collins, 2005; Seiffge-Krenke, 2011). Specifically, studies have shown that having low quality friendships at adolescence may lead to poorer coping in romantic conflicts in later romantic relationships (Linder & Collins, 2005; Windle & Mrug, 2009). Management of interpersonal problems may also differ by gender in several ways similar to those described for their friendships. Females tend to manage problems by seeking social support and processing their
emotions, considered by researchers to be an avoidant problem solving approach (Seiffge-Krenke, 2011). In contrast, males appear to more commonly employ problem-approach strategies when confronted with challenges (Rose & Rudolph, 2006).

Together, this suggests that friendships are often relied upon as a source of support for managing romantic problems, especially among girls (Rose & Rudolph, 2006). However, the quality and content of discussion when adolescents consult with friends about romantic experiences remains unclear. Given that adolescents appear to turn to friends to navigate romantic challenges as a means of coping, and that this does not always actively solve the problem (Seiffge-Krenke, 2011), this begs the question of whether support-seeking behavior is always beneficial to the adolescent (Szwedo et al., 2015). In fact, some studies have found that utilization of social support to discuss interpersonal problems, as an avoidant approach to problem-solving, has been associated with depressive affect (Seiffge-Krenke & Klessinger, 2000). Additionally, recent studies (e.g., Davila, 2008; Starr & Davila, 2009) have speculated that perhaps some youth co-ruminate with friends about such experiences, and as such, are vulnerable to those same emotional adjustment tradeoffs linked with co-rumination (i.e., depression), which the current study attempts to elucidate.

**Co-rumination, Romantic Relationships, and Depressive Symptoms**

Co-rumination may play a salient role in the association between romantic involvement and depressive symptom development, particularly for girls (Davila, 2008). Although there are few studies to date, there has been attention paid to the role of co-rumination in depressive symptom development for romantically-involved youth (Davila, 2008; Starr & Davila, 2009). Findings specifically suggest that romantically-involved youth may be especially likely to engage in co-rumination, which may have subsequent implications for youths’ wellbeing.
In a seminal study, Starr and Davila (2009) conducted a prospective, longitudinal study of romantically-involved and non-involved adolescent girls to determine whether co-rumination was predictive of depressive symptom development changes. Findings suggested that co-rumination was predictive of changes in depressive symptoms over time for romantically-involved girls; however, this finding was not significant for non-romantically-involved girls. The authors posited this to suggest that co-rumination may be particularly indicative of depressive symptoms depending on adolescent girls’ romantic circumstances.

Starr and Davila’s (2009) findings are compelling, and this work begs the question of why such an association might exist. The authors suggested that the increased problems and intense emotions that arise in romantic relationships and other romantic experiences may prompt more support-seeking from friends, as well as discussion of such problems with friends in a perseverative way. However, this has not yet been empirically studied. In fact, few studies have assessed the content or quality of adolescent’s co-ruminative behavior (Davila, 2008). At the time of Starr and Davila’s (2009) study, an observational coding system for co-rumination had not yet been developed and as such, analyses were limited to self-reported co-rumination. To date, one of the only published studies to report topics of co-ruminative problem-talk was conducted by Byrd-Craven and colleagues (2011), who reported that romantic problems were one of the most commonly cited topics of discussion.

As such, it may be that romantically-involved girls are more likely to seek support from friends via co-rumination. This makes sense, given that romantically-involved youth tend to have higher social competence compared to their non-involved counterparts (e.g., Brendgen et al., 2002; Szwedo et al., 2015). As such, although it may feel like a beneficial way to manage problems and lead to higher friendship quality (Schwartz-Mette & Rose, 2012), co-rumination may partially explain why romantically-involved girls have an even greater vulnerability to
depressive symptom development (Davila, 2008). This association may also be bidirectional, such that romantically-involved girls’ increased risk for depressive symptoms may lead to greater engagement in co-rumination, which in turn exacerbates depressive symptoms.

Another limitation of Starr and Davila’s (2009) findings was their study’s use of an all-female sample. As described above, research has suggested that adolescent boys co-ruminate less than girls on average (e.g., Rose, 2002), and for those that do co-ruminate, it appears that they do not have the same risk for depressive symptom development as girls (Rose et al., 2007). Perhaps due to the fact that boys endorse less self-disclosure and intimacy in their friendships on average (Rose & Rudolph, 2006), co-ruminating has an even greater benefit for male friendship quality (Rose et al., 2007). Additionally, boys consistently seem to endorse fewer romantic stressors, and turn to friends less often to cope with such stress (Seiffge-Krenke, 2011). Taken together, it is not expected that romantically-involved boys will co-ruminate with friends as frequently as female friendship dyads, not because they do not feel distress, but because they less often endorse such stressors as salient and do not turn to friends to discuss them. However, this has not yet been examined.

Also unexplored is the role of romantic relationship quality and friendship quality in this association. Youth in romantic relationships that are marked by positive features may have fewer stressors to navigate with friends and/or may be more likely to navigate romantic problems within the romantic relationship rather than with friends, as is more common within relationships in late adolescence and adulthood (Seiffge-Krenke, 2011; Shulman & Seiffge-Krenke, 2001). Additionally, depressive symptoms have been associated with poorer use of positive problem solving skills in adolescents’ dating relationships concurrently and over time (Vujeva & Furman, 2011), and this has been evidenced bidirectionally as well, such that positive coping with a romantic partner may buffer depressive symptom development (Szwedo et al., 2015). In
addition, consistent with the literature, youth may be more likely to disclose, and possibly co-ruminate, about romantic problems within a high-quality friendship marked by positive features including intimacy and aid, which could be predictive of and predicted by depressive symptoms (Rose, 2002; Seiffge-Krenke, 2011).

Undoubtedly, refining our understanding of the intersections between interpersonal behavior in friendships and emotional adjustment is an important focus for future research (Davila, 2008). In particular, a more nuanced analysis of co-rumination among romantically-involved youth is needed to better understand the risk for depression that has been well-documented in romantically-involved girls. Additionally, consideration of positive romantic relationship and friendship quality of romantically-involved youth is needed. What is more, much of the relevant literature has drawn upon cross-sectional data, within predominately female samples (Davila, 2008), which significantly limits the field. Studies that include males and gender diverse youth, employ self-report and observational methodologies, and utilize a longitudinal study design will allow for more nuanced understanding of gender differences in interpersonal risk factors for depressive development in adolescence.

The Current Study

The current study assessed the association among romantic relationship involvement, depressive symptoms, and co-rumination in friendships, with further consideration of the influence of friendship quality and romantic relationship quality within these associations. Although there is a documented link between co-rumination and depressive symptoms, particularly among romantically-involved adolescent girls, research has not yet explored mechanisms of this association. Little is known about whether romantic relationship quality or friendship quality may influence the impact of co-rumination on depressive symptoms for
romantically-involved youth, and/or whether the content (i.e., topic) of problem-talk also may play a role in exacerbating depressive symptom development.

Using a longitudinal, multi-method design, this study aimed to examine the temporal ordering of co-rumination and depressive symptoms, to compare the impacts of observed and self-reported co-rumination, and to explore the context of romantic problem-talk. The longitudinal study design (described in further detail below) involves a self-report assessment at Time 1, an observational data collection at Time 2 approximately one month later, and a self-report measure administered at Time 3 approximately one month after that. The research addressed five primary aims. First, the study tested whether the longitudinal association between romantic relationship involvement and later depressive symptoms is mediated by co-rumination (Aim 1). It was hypothesized that adolescents’ romantic relationship involvement at Time 1 would predict increases in depressive symptoms at Time 3 via self-reported co-rumination (Time 1) and/or observed co-rumination (Time 2).

Second, this study examined whether the longitudinal association between romantic relationship quality and later depressive symptoms is mediated by co-rumination (Aim 2). It was hypothesized that adolescents’ romantic relationship quality at Time 1 would predict increases in depressive symptoms at Time 3 via self-reported co-rumination (Time 1) and/or observed co-rumination (Time 2). Third, the study tested whether the longitudinal association between romantic relationship involvement and later depressive symptoms, as mediated by self-reported and/or observed co-rumination, is moderated by positive friendship quality (Aim 3). It was hypothesized that positive friendship quality (Time 1) would moderate the association between Time 1 romantic involvement and Time 3 depressive symptoms, such that romantic involvement would more strongly predict depressive symptoms via co-rumination for those with lower positive friendship qualities (Time 2).
Next, the research assessed the impact of the topic of observed problem talk with friends. Specifically, the current study tested whether discussion of romantic problems with friends during an observational problem talk task strengthened the association between romantic relationship involvement and later depressive symptoms via co-rumination (Aim 4). It was hypothesized that the association between Time 1 romantic involvement and co-rumination (assessed at Time 1 via self-report and Time 2 via observation) would be stronger for adolescents who discuss romantic problems with a friend (Time 2). Lastly, the potential moderating role of gender was tested in the original (Aim 1) mediation model (Aim 5). It was expected that all hypothesized associations explored in the context of Aim 1 would be stronger for females as compared to males.
CHAPTER 2:
METHOD

Participants

Data for this study were collected as part of a larger study funded by an external grant awarded to the dissertation supervisor (R15 MH116341-01; PI: Schwartz-Mette). This study was approved by the University of Maine’s Institutional Review Board (IRB #2017-05-18). The sample included 338 youth in 119 friendship dyads. Participants were 9th through 12th grade students (age range 14-19 years; $M_{age} = 16.21$ years; see Table 1 for demographic characteristics) enrolled in one private and one public high school, both near a mid-sized New England University. Seventy-seven participants reported to be in a romantic relationship (24%; see Table 2), whereas 244 were reportedly single and 17 did not report their relationship status. There was a similar number of romantically-involved youth at the public high school ($n = 39$; 12%) and at the private high school ($n = 38$; 11%). Regarding sexual orientation, 77.9% of participants were heterosexual, 2.5% were homosexual (gay/lesbian), 5% were questioning, and 14.6% reported another sexual identity; 17 did not report their sexual orientation.

Initial power analyses were conducted to determine the sufficient sample size to detect medium-sized effects ($ES= 0.15$) with alpha set to .05. G*Power software (Faul et al., 2007) indicated a minimum sample of 119 was required to detect medium effects in multiple linear regression analyses for the most complex model to be tested, which includes four predictors and three tested predictors. However, because the data is nested within dyads, it was necessary to calculate the requisite nested sample size that is equivalent to a non-nested sample of 119 (i.e., $n_{\text{nest}}$; Cook & Kenny, 2005; Kenny et al., 1998; Kenny et al., 2006). The formula for $n_{\text{nest}}$ takes into account the expected intraclass correlations (ICC) for study variables and the nested group size ($n = 2$). A review of the literature for studies of friendship dyads including the variables of
interest indicated that observed ICCs (utilized as an index of similarity among friends within a dyad) range from .15 to .22 (e.g., Giletta et al., 2011; Schwartz-Mette & Rose, 2012). For an ICC of .15, a nested sample of 132 is equivalent to a non-nested sample of 119, and for an ICC of .22, a nested sample of 146 is equivalent to a non-nested sample of 119. As such, a conservative estimate of the required sample size is 146 participants; this minimum sample was met.

Parent/guardian consent was collected during a pre-study enrollment period, held for approximately 4-6 weeks at the beginning of the school year (September-October 2019). Specifically, research assistants advertised the study in the school (i.e., visits to classrooms) and at school events (e.g., back-to-school night, athletic events) and provided interested students with consent forms for parents/guardians to complete and return to the school (e.g., to a designated location in the school’s main office). School officials also distributed links to an online parent/guardian consent form via parent e-newsletter and parent emails. The research team asked parents/guardians to provide their direct contact information in the event that participants reported that they were at significant risk for suicide (See Risk follow-up policies [depressive symptoms, self-injury, suicidality] section). Research team members, as opposed to school staff, were directly involved in communication with students to prevent coercion of students to participate. All youth provided assent to participate just prior to commencing the first study assessment.

### Table 1

*Demographic Characteristics of Sample*

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Table 1 (continued)

Not Hispanic or Latino  311  97.2

Race

   American Indian/Alaskan Native  8  2.5

Asian  25  7.8

   Native Hawaiian or Other Pacific Islander  1  0.3

Black or African American  2  0.6

White  271  80.2

More than one race  14  4.1
Missing Data

Some participants had missing data on the Time 1 and Time 3 measures due to attrition, absences, or other reasons. The pattern of missingness was evaluated using Little’s test (1988). A non-significant Little’s test indicates that data are missing completely at random (MCAR), which means that the pattern of missingness is unrelated to any study variable(s) and that imputing missing data is permissible. Imputing missing values is preferable to deletion (i.e., listwise, pairwise) methods when data are MCAR (e.g., Widaman, 2006).

When individual measures were tested and averaged, Little’s MCAR test indicated that these data were missing completely at random (MCAR), $X^2(11) = 34.68, p = .094$. Thus, missing data were imputed using an expectation maximization (EM) procedure in SPSS, and the full sample was retained for all analyses. Given that romantic relationship measures were only completed for those in a romantic relationship and not all participants could complete the Time 2 observed task, missing data were not imputed for these measures.

This dissertation includes data from three of the larger project’s five time points (see timeline below). A pre-study enrollment period occurred between September and October of 2019. At Time 1 (November 2019) and Time 3 (February 2020), self-report surveys were administered in the school setting. At Time 2 (December-January 2019), observational data was collected predominantly in the school setting; dyads who had a scheduling conflict during the school day were given the opportunity to complete the observational task after school at the lab.
At Times 1 and 3, students with parent/guardian consent and who provided assent completed surveys online using the online survey system, Qualtrics©, during homeroom, guidance class, or another designated class period approved by school administration. Those without parent/guardian consent and those who had parent/guardian consent but who did not assent to participate were given the option of a quiet activity of their choosing (e.g., reading, classwork). Survey items at Time 1 and Time 3 were identical, including demographic questions assessing sexual and gender identity. The surveys took approximately 40 minutes to complete. The research team was on site to answer questions and/or provide one-on-one assistance to any student (e.g., reading items aloud). Students who were absent or needed more time completed assessments during another allotted time at school or at home. Contact information for the research team was made available to these students so they could obtain assistance if needed.

At Time 2, an observational task was administered to friendship dyads. Reciprocal friendship dyads were identified through matched sociometric friendship nominations collected at Time 1 (see Appendix H). Data collection occurred in designated classrooms that were equipped, at a minimum, with tables, chairs, and desks. Participants were seated at individual desks apart from one another and used their own cell phone or laptop to answer a brief, pre-task questionnaire via Qualtrics© (see Measures section, below). If they did not have their own device, they were given an iPad to borrow or a paper packet to complete. They then were reunited to discuss a problem that each of them was having (Rose et al., 2014), identified during the pre-observation questionnaire assessment.

Participants were compensated with Amazon gift cards that were delivered via email. Youth earned $10.00 in Amazon credit for completing the Time 1 Assessment, $20.00 for completing the Time 2 Assessment, and $10.00 for completing the Time 3 Assessment. Data collected at two later time points were not utilized for the current study.
Survey Assessments

Online Self-Report Questionnaires (Time 1 and Time 3)

The following measures were administered as part of the Time 1 and Time 3 self-report questionnaire assessments.

1. **Demographic information.** Participants were asked to respond to items assessing their age, gender identity, racial and ethnic identities, sexual orientation, and date of birth (see Appendix C).

2. **Depressive symptom presence and severity.** Participants rated 20 items of the Center for Epidemiologic Studies Depression Scale (Radloff, 1977; Appendix D), a measure of various affective, somatic, interpersonal, cognitive, and behavioral symptoms of depression within the past week. This measure has demonstrated good reliability among adolescent populations in previous research (e.g., $\alpha = .87$; Schwartz-Mette & Rose, 2016). Reliability in the current study was excellent (Time 1 $\alpha = .91$, Time 3 $\alpha = .93$).

3. **Best friendship and romantic relationship quality.** The 21-items from the Network of Relationships Inventory-Social Provisions Version (Furman & Buhrmester, 1985) were administered to assess positive qualities of youths’ best friendships (Appendix F) and romantic relationships (if applicable; Appendix G). Specifically, youth rated the degree to which this friendship and romantic relationship were characterized by social provisions (affection, reliable alliance, enhancement of worth, intimacy, instrumental help, companionship, and nurturance of others). Nine other items assess negative qualities (conflict and antagonism) or other qualities of friendships and romantic relationships; however, these quality scores were not used in primary study analyses. Factor scores for positive qualities were derived by averaging responses to items from the relevant positive scales. Reliable scores for positive friendship quality ($\alpha = .95$; e.g., Glick et al., 2013) and
positive romantic relationship quality ($\alpha = 0.91$; e.g., Roisman et al., 2008) have been obtained in past research with adolescent populations. Negative quality scores were not used in the current study. Reliability for positive friendship quality (Time 1 $\alpha = .95$) and positive romantic relationship quality (Time 1 $\alpha = .92$) was excellent in the current study.

4. **Co-rumination.** Participants completed the Co-rumination Questionnaire (Rose, 2002; Appendix E), a 27-item self-report measure that assesses the degree to which individuals co-ruminate with friends. Specifically, items assess the degree to which they rehash, speculate, focus on negative affect, and encourage prolonged engagement while discussing problems with friends. Items are averaged to create a reliable co-rumination score and have demonstrated excellent reliability in previous studies of adolescent friends (e.g., $\alpha = .97$; Schwartz-Mette & Rose, 2012). Reliability of the measure was excellent in the current study (Time 1 $\alpha = .97$).

5. **Sociometric nominations.** Participants were given a list of participating grade-mates and asked to choose a 10 same- or other-gender friends. They were then asked to identify, of the friends chosen, which was their “best” friend (Appendix H). This procedure was used to identify reciprocal friendships (i.e., both dyad members nominated one another) for scheduling the dyadic observational task. For the purposes of the observational task, priority was given to same-gender reciprocal best friends, followed by same-gender friends and other-gender friends. Additionally, youth indicated whether they were in a romantic relationship and identified the name of their romantic partner if the partner attended their school. These data were used to assess romantic relationship involvement, measured as a dichotomous (yes-1/no-0) variable.
Dyadic Observational Task (Time 2)

The Time 2 assessment included a brief pre-observation self-report questionnaire, an observational task, and one post-observation self-report questionnaire.

Problem generation. During a pre-observation questionnaire assessment, dyad members were asked to list a current problem they have as part of the Problem Generation and Salience Questionnaire (Rose et al., 2014; Appendix I). Although this questionnaire also assesses the salience of the problem (e.g., how important or difficult to solve), salience questions were not included in analyses for the current project. Original studies using this measure have found that youth were easily able to generate problems to discuss (Rose et al., 2014).

Observed problem talk (Rose et al., 2014). The experimenter then instructed the dyad to talk about each person’s problem that was identified on the questionnaire for up to 15 minutes. The dyads were told that the time spent discussing their problem and who discusses their problem first does not matter (see Appendix J). Additionally, they were told that if they were done discussing their problems, they could talk about anything else they would like for the remainder of the time. The dyadic interactions were video-recorded using iPads and an external microphone to maximize sound quality. The experimenter returned to the room after 14 minutes.

This problem talk task has been used with adolescents, and its validity has been established in past research (e.g., Rose et al., 2014; Schwartz-Mette & Rose, 2016). If the researcher became aware of a significant conflict/distressing situation, the experimenter was trained to stop the interaction before the full time has concluded. In rare instances, interactions were stopped early due to scheduling conflicts with needs to use the room. Video-recordings of the dyadic interactions were transcribed verbatim and later coded using an established coding scheme to assign each dyad a general co-rumination score (Rose et al., 2014) and to code whether or not the dyad discussed problems having to do with either partner’s romantic
experiences(s). Of note, participant interactions were each coded for romantic experience content, regardless of each partner’s romantic relationship status.

Observed co-rumination scores were obtained using an established coding system that has been validated in past research. Specifically, observed co-rumination scores derived from this problem talk task and associated coding system have been shown to be associated with both self-reported co-rumination and positive friendship quality (Davidson et al., 2014; Rose et al., 2014). In previous research (Rose et al., 2014), trained coders have demonstrated excellent reliability using this coding system to rate each of four aspects of observed dyadic co-rumination on a 1-5 Likert scale: rehashing (ICC = .92), speculating about the causes and consequences of problems (ICC = .98), focusing on negative affect (ICC = .91), and encouraging problem talk (ICC = .94). Time spent talking about problems is measured using a stopwatch to assess total minutes/seconds spent talking about problems (ICC = .92; Rose et al., 2014).

To prepare for coding, all video-recorded interactions were first transcribed verbatim, and the completed transcript was then checked by a separate member of the research team. Coders (two graduate students and one advanced undergraduate student) were then trained by the dissertation supervisor to become reliable in using Rose and colleagues’ 2014 co-rumination coding system (see Appendices L and M). First, the training supervisor provided background reading and review of the coding system. Following discussion of this material, coders coded one transcript, and codes were discussed as a group. Coders first identified segments of the transcript during which the dyad talked about problems. Next, coders timed this identified section of speech against the video-recording to obtain the co-rumination time score. Finally, coders coded the four other aspects of co-rumination on a third pass, using the transcript and video-recording. This process continued using three sample transcripts from the current study until corrective feedback provided to each coder was minimal and coders reported understanding of the
system, then separately rated 25% of interactions from this study (n = 21 dyads), and interrater reliability was evaluated using two-way random, absolute agreement intraclass correlation coefficients (ICC; Hallgren, 2012; Shrout & Fleiss, 1979).

Due to training and coding experience, this writer was considered the anchor coder. Reliability was established with each of the other coders. The average interrater agreement for each coder (degree of agreement with each coder and this writer) on problem talk identification was 97% for Coder 1 and 96.1% for Coder 2. Reliability was as follows: rehashing (ICCs = Coder 1: .90; Coder 2: .95), speculation (ICCs = Coder 1: .92, Coder 2: .90), negative affect (ICCs = Coder 1: .86, Coder 2: .86), mutual encouragement (ICCs = Coder 1: .95; Coder 2: .95), time spent talking about problems (ICCs = Coder 1: .99; Coder 2: .98). As suggested by the coding manual, each of the five scores were standardized and then averaged together to create an overall co-rumination score for each dyad.

To assess whether or not dyads discussed romantic relationships during the problem talk task, video-recordings of the task were also coded dichotomously (yes-1/no-0) to indicate whether the dyad discussed either friend’s romantic experience(s) (See Appendix M). The coding process was identical to the one used to code observed co-rumination, such that graduate student coders were trained and coded 25% of interactions from this study until acceptable interrater reliability was reached. Interrater reliability for this dichotomous variable was evaluated using percent agreement, and reliability was excellent (Coder 1: 97%; Coder 2: 96%).

**Post-observation questionnaire.** After the observation concluded, youth were instructed to complete an additional questionnaire at separate desks; data from this questionnaire were not analyzed for the purposes of this study.

**Risk follow-up policies (depressive symptoms, self-injury, suicidality).** Specific procedures were in place to identify those participants who endorsed items indicating risk for
significant emotional distress as part of the larger project (Appendix K). Participants’ responses to measures of nonsuicidal self-injury (NSSI) and suicidality, neither of which were utilized for this project, and a measure of depressive symptoms (see Survey Measures, above) were administered at Time 1 and Time 3, as well as at a fifth time point not utilized in the current project.

Immediately following the Time 1, Time 3, and Time 5 data collections, the research team reviewed participants’ responses to the measure of suicidality and identified any participant who reported having had specific suicidal plans, intent, or attempts in the past, and/or any current suicidal plans or intent. The research team worked with school-based guidance staff to speak directly with these participants and their parent or guardian to assess for imminent risk.

Following the Time 5 (final) survey assessment, parents of youth whose survey responses at Time 5 indicated significantly elevated depressive symptoms, frequent self-harm, or past or current suicidal ideation were contacted by the research team and provided with the relevant risk information and community resources for further support. These risk management procedures were approved by the University of Maine IRB and NIMH.
CHAPTER 3:  

RESULTS

Data Analysis Plan

The sample includes nested data due to the tendency for friends to be more similar to one another (Campbell & Kashy, 2002) and as such, data could not be considered independent. Thus, to account for the likely homophily of study variables, analyses were conducted using statistical techniques that account for the interdependence of dyadic data, using the Actor Interdependence Model (APIM; Kenny, 1996). The APIM is commonly utilized in peer interaction studies (e.g., Burk & Laursen, 2005; Cilessen et al., 2005). The statistical software SPSS © (version 26) was used to test all descriptive and multilevel model analyses described below.

Notably, data included mostly same-gender friendship dyads, but there were a small number of dyads with heterogeneous gender identities ($n = 14$). This includes both dyads consisting of cisgender male and female youth, as well as those in which at least one friend identified their gender as falling outside of the gender binary. As such, analyses were conducted once with the full sample and then again omitting heterogeneous gender dyads to compare outcomes to the existing literature that looks at same gender friendship under the constraints of the gender binary framework. Results are included within each aim.

Means, Standard Deviations, Correlations

Means, standard deviation, ranges, and correlations among all study variables are presented in Table 2 and Table 3. On average, youth self-reported moderate levels of co-rumination. Mean levels of the subscales for observed co-rumination indicated average levels of rehashing, negative affect and speculation, and slightly above-average mutual encouragement. The average time spent discussing problems was moderately high, and most youth did not discuss romantic experiences (59.4%). The mean level of reported depressive symptoms fell in
the mild range at Times 1 and 3. The mean levels of both positive friendship and romantic relationship variables were both moderate at Time 1, with levels of positive romantic relationship quality rated only slightly higher than positive friendship.

Consistent with previous studies (e.g., Rose, 2002; Rose et al., 2007; Starr & Davila, 2008), higher self-reported co-rumination at Time 1 was positively associated with higher self-reported positive friendship quality, romantic relationship involvement, and depressive symptoms, concurrently and with depressive symptoms 3 months later. As expected, self-reported co-rumination at Time 1 and observed co-rumination at Time 2 were significantly positively correlated. Moreover, Time 1 self-reported co-rumination was significantly, positively associated with depressive symptoms at Times 1 and 3 and with observed romantic experience talk at Time 2. Notably, Time 2 observed co-rumination was significantly positively correlated with Time 2 observed romantic experience talk and Time 1 depressive symptoms, but not with positive friendship quality at Time 1, romantic involvement at Time 1, nor depressive symptoms at Time 3.
### Table 2

**Correlations, Means, and Standard Deviations**

| Variable                                           | M (SD)/ Percentage | Observed Range | | | | | | | |
|----------------------------------------------------|--------------------|----------------|---|---|---|---|---|---|
| 1. Self-reported Co-rumination (T1)                | 2.62 (.84)         | 1.00 - 4.96    | - | .14* | .17** | .43** | .15 | .17** | .23** | .29** |
| 2. Observed Co-rumination (T2)                     | 0                  | 1.00ª           | - | - | .04 | .09 | .01 | .12* | .18** | .12   |
| 3. Romantic relationship status (T1)               | 76% = No 24% = Yes | 0.00 = No 1.00 = Yes | - | - | - | .11 b | - | .09 | .16** | .10   |
| 4. Positive Friendship Quality (T1)                | 3.29 (.82)         | 1.00 - 5.00    | - | - | - | - | .35** | .21** | .13* | .19** |
| 5. Positive Romantic Relationship Quality (T1)     | 3.69 (.66)         | 1.90 - 4.86    | - | - | - | - | - | -.04 | .19 | .21   |
| 6. Observed Romantic Problem Talk (T2)             | 59.4% = No 40.6% = Yes | 0.00 = No 1.00 = Yes | - | - | - | - | - | - | .13* | .15* |
| 7. Depressive Symptoms (T1)                        | 16.16 (10.47)      | 0.00 - 50.00   | - | - | - | - | - | - | - | .72** |
| 8. Depressive Symptoms (T3)                        | 16.78 (11.25)      | 0.00 - 53.00   | - | - | - | - | - | - | - | - |

*Notes. *p < .05. **p < .001. T1 = Time 1; T2 = Time 2; T3 = Time 3. a = The mean and range of this variable reflect that this is a standardized statistic. b = Only participants in a romantic relationship completed the measure of romantic relationship positive qualities and cannot be correlated.*
Table 3

*Means and Standard Deviations of Observed Co-rumination Subscales*

<table>
<thead>
<tr>
<th>Observed Co-rumination Subscale</th>
<th>Observed Range</th>
<th>M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rehashing</td>
<td>1.00 - 5.00</td>
<td>3.27 (0.94)</td>
</tr>
<tr>
<td>Negative affect</td>
<td>1.00 - 5.00</td>
<td>3.20 (0.94)</td>
</tr>
<tr>
<td>Speculation</td>
<td>1.00 - 5.00</td>
<td>3.35 (1.06)</td>
</tr>
<tr>
<td>Encouragement</td>
<td>2.00 - 5.00</td>
<td>3.78 (0.97)</td>
</tr>
<tr>
<td>Time (minutes)</td>
<td>1.57 - 15.6</td>
<td>10.49 (3.65)</td>
</tr>
</tbody>
</table>
Mean-Level Gender Differences

Participants could indicate their gender identity as falling within the gender binary (i.e., male, female) or outside of this binary (e.g., gender fluid, non-binary). Only a small number of youth identified as non-binary at Time 1 (n = 9), and this non-binary group was highly heterogeneous. For example, three youth wrote non-binary, three wrote gender-fluid, one youth wrote demiboy, one indicated they were not sure, etc. The heterogeneity of gender identities in this non-binary category precluded the ability to reliably test group differences as a function of all possible gender categories. As such, gender difference tests were conducted with the sample of youth identifying as either male or female.

Mean-level gender differences for continuous study variables were tested using multilevel models. Separate models were tested in which each continuous variable (Time 1 and Time 3 depressive symptoms, Time 1 self-reported co-rumination, Time 2 observed co-rumination, Time 1 positive friendship quality, Time 1 positive romantic quality) was predicted from participants’ self-reported gender identity. The main effect of gender on Time 1 depressive symptoms was significant (b = -7.09, p < .001), suggesting significantly higher levels of reported depressive symptoms in girls [(M (SD) = 18.58 (10.87)] than boys [(M (SD) = 11.99 (8.05)]. This pattern of higher levels for girls [(M (SD) = 19.61 (11.57)] compared to boys [(M (SD) = 11.85 (8.52)]] was also observed at Time 3 (b = -8.38, p < .001). The main effect of gender on positive friendship support at Time 1 was also significant (b = -.47, p < .001), indicating higher positive friendship quality for girls [(M (SD) = 3.47 (.83)] compared to boys [(M (SD) = 2.99 (.73)]. A similar pattern was revealed for the effect of gender on self-reported co-rumination (b = -.25, p < .05), suggesting that girls [(M (SD) = 2.72 (.84)] reported significantly higher levels of co-rumination than did boys [(M (SD) = 2.47 (.84)]. However, the main effects of gender on self-reported positive romantic quality at Time 1 (b = -.07, p = .706) and on Time 2 observed co-
rumination (b = -.00, p = .98) were not significant. This suggests that mean levels of observed co-rumination and self-reported positive romantic relationship quality was similar for participants identifying as male and female.

Gender differences for Time 1 romantic relationship involvement and Time 2 observed romantic experience talk were tested using a one-way ANOVA, as they are both categorical variables. For both romantic relationship involvement and observed romantic talk, the assumption of homogeneity of variances was violated, as assessed by Levene’s test for equality (p’s < .05). Thus, a one-way Welch ANOVA was conducted to determine whether romantic status or observed romantic problem talk differed for girls and boys. Results indicated no statistically significant gender differences in observed romantic problem talk, Welch’s F(1, 247.09) = 2.78, p = .10 or in romantic relationship involvement, Welch’s F(1, 270.35) = 1.49, p = .22.

**Same-gender dyads.** Analyses were conducted again, this time only including the sample of same-gender dyads. Many consistencies emerged. Specifically, the main effects of gender on Time 1 (b = -7.08, p < .01) and Time 3 (b = -8.82, p < .01) depressive symptoms, as well as positive friendship quality (b = -4.9, p < .01) and self-reported co-rumination (b= -0.27, p < .05) remained significant, with girls reporting higher levels of each variable as compared to boys. Also consistent with earlier analyses, the effect of gender on positive romantic quality was not significant (b = -.14, p = .49). In contrast to analyses including the whole sample, in the sample of only same-gender dyads, gender significantly predicted observed co-rumination (b = -.50, p < .01), with higher levels observed in girl dyads as compared to boy dyads. When one-way ANOVAs testing Time 1 romantic relationship involvement and Time 2 observed romantic experience talk were tested again, the assumption of homogeneity of variances was again violated, as assessed by Levene’s test for equality (p’s < .05). A one-way Welch’s ANOVA,
again, revealed no statistically significant gender differences in romantic involvement $F(1, 197.39) = 1.62$ ($p = .21$). However, significant gender differences were detected in observed romantic experience discussion $F(1, 210.37) = 4.41$, $p < .05$, with cisgender female dyads talking more about romantic experiences than male dyads.

**Multilevel Models**

**Aim 1: Explore Whether the Association between Romantic Relationship Involvement and Later Depressive Symptoms is Mediated by Co-Rumination**

**Analysis strategy.** Multilevel mediation models were tested to address the hypothesis that the association between romantic relationship involvement at Time 1 and depressive symptoms at Time 3 is mediated by Time 1 self-reported (Aim 1a) and Time 2 observed co-rumination (Aim 1b). Time 1 depressive symptoms were controlled in all models.

**Hypotheses.** It was hypothesized that the association between self-reported romantic relationship involvement at Time 1 and self-reported depressive symptoms at Time 3 would be mediated by self-reported co-rumination at Time 1. Specifically, it was hypothesized that Time 1 romantic relationship involvement would predict higher levels of Time 1 self-reported co-rumination, which would predict increased depressive symptoms at Time 3 (1a). Moreover, romantic relationship involvement was expected to predict higher levels of Time 2 observed co-rumination, which would predict increased depressive symptoms at Time 3 (1b).

**Results. 1a (whole sample).** Separate multilevel regression models were tested for each path of the mediation model. First, depressive symptoms at Time 3 were predicted from romantic involvement at Time 1 (path c), controlling for Time 1 depressive symptoms. The effect of Time 1 depressive symptoms was significant ($b = 0.78$, $p < .001$), indicating stability of symptoms over time. However, the main effect of Time 1 romantic involvement on Time 3 depressive symptoms was not significant ($b = 0.58$, $p = .61$).
Next, the effect of romantic involvement on self-reported co-rumination was tested (path a), again controlling for Time 1 depressive symptoms. The main effects of both Time 1 romantic involvement ($b = 0.02, p < .05$) and of Time 1 depressive symptoms ($b = 0.34, p < .05$) on Time 1 self-reported co-rumination were significant. Then, a model was tested in which Time 1 self-reported co-rumination predicted Time 3 depressive symptoms (path b), controlling for Time 1 depressive symptoms. The main effect of self-reported co-rumination on Time 3 depressive symptoms was observed to be significant ($b = 1.69, p < .05$), which suggests that higher levels of co-rumination at Time 1 was associated with higher depressive symptoms over time.

Finally, a model tested the effect of all variables (Time 1 romantic involvement, Time 1 depressive symptoms, Time 1 self-reported co-rumination) on Time 3 depressive symptoms (path c prime). The main effects of self-reported co-rumination ($b = 1.68, p < .05$) and Time 1 depressive symptoms ($b = 0.75, p < .01$) remained significant and the effect of Time 1 romantic involvement was still nonsignificant in this model ($b = 0.26, p = .98$).

As suggested by Mackinnon and colleagues (2002), a significant direct path (path c) is not necessary to test for mediation. Given that both the effect of romantic involvement on self-reported co-rumination (a path) and the effect on self-reported co-rumination on Time 3 depressive symptoms (b path) were significant, mediation could be tested. The indirect effect was calculated, and Sobel’s test indicated that it was significant (Sobel’s $z = 56.97, p < .001$). This suggests that the effect of romantic involvement on later depressive symptoms was at least partially mediated by self-reported co-rumination.
Figure 1a Panel A

Multilevel model including whole sample

![Diagram of the model](image)

Note. Values presented in the figure indicate unstandardized beta (b) values for each tested path (i.e., a, b, c). Solid lines indicate significant main effects < .05, while dashed lines indicate nonsignificant values. Depressive symptoms at Time 1 were controlled when testing each path of the model.

1a (same-gender dyads only). Analyses were tested again, including only same-gender friendship dyads. Similar to the above analyses, the model testing path c indicated that the main effect of Time 1 romantic involvement on Time 3 depressive symptoms was not significant (b = 0.39, p = .75). As with the full dataset, romantic involvement (b = 0.2, p < .05) and Time 1 depressive symptoms (b= 0.39, p < .05) significantly predicted self-reported co-rumination (path a). The main effects of Time 1 self-reported co-rumination (b = 1.72, p < .05) and Time 1 depressive symptoms on Time 3 depressive symptoms (b = 0.74, p < .01) were also significant (path b), which is also consistent with previous models. When the model (c’ path) tested the effect of all variables, results indicated that depressive symptoms (b = 0.74, p < .01) and self-reported co-rumination (b = 1.74, p < .05), but not romantic involvement (b = -0.31, p = .81)
significantly predicted Time 3 depressive symptoms. This is consistent with results when the full dataset was tested. Given this, the indirect effect was calculated again, and Sobel’s test indicated that it was significant (Sobel’s $z = 2.07, p < .05$). That suggests that the effect of romantic involvement on later depressive symptoms was at least partially mediated by self-reported co-rumination, regardless of if heterogeneous-gender dyads were included.

**Figure 1a Panel B**

*Multilevel model including same-gender dyads only*

![Diagram](image)

*Note.* Values presented in the figure indicate unstandardized beta (b) values for each tested path (i.e., a, b, c). Solid lines indicate significant main effects $< .05$, while dashed lines indicate nonsignificant values.

Depressive symptoms at Time 1 were controlled when testing each path of the model.

**1b (whole sample).** Analyses then tested whether Time 2 observed co-rumination mediated the association between Time 1 romantic involvement and Time 3 depressive symptoms, controlling for Time 1 depressive symptoms. These analyses involved an identical set of models except that Time 2 observed co-rumination was used in place of Time 1 self-reported co-rumination. As the c path in this set of models is identical to the c path in the set of models involving self-reported co-rumination, the c path was not tested again, but recall that the main
effect of Time 1 romantic involvement on Time 3 depressive symptoms was not significant ($b = 0.51, p = .61$). Neither romantic involvement ($b = -0.01, p = .81$) nor T1 depressive symptoms ($b = 0.003, p = 1.06$) significantly predicted Time 2 observed co-rumination (a path), and observed co-rumination did not significantly predict Time 3 depressive symptoms ($b = -0.12, p = .84$). The final multilevel model testing the effects of all predictor variables on Time 3 depressive symptoms revealed that only the main effect of Time 1 depressive symptoms ($b = 0.78, p < .001$) was significantly predictive of Time 3 depressive symptoms. Given that neither the a nor c path were significant, mediation could not be tested. This suggests that, unlike self-reported co-rumination, the effect of romantic involvement on later depressive symptoms was not mediated by observed co-rumination.

**Figure 1b Panel A**

*Multilevel model including whole sample*

![Diagram](image)

*Note.* Values presented in the figure indicate unstandardized beta (b) values for each tested path (i.e., a, b, c). Solid lines indicate significant main effects ≤ .05, while dashed lines indicate nonsignificant values. Depressive symptoms at Time 1 were controlled when testing each path of the model.
1b (same-gender dyads only). Analyses then tested the mediation model with Time 2 observed co-rumination. Neither romantic involvement (b = 0.00, p = .07) nor T1 depressive symptoms (b = -0.00, p = .51) significantly predicted Time 2 observed co-rumination (a path), and observed co-rumination did not significantly predict Time 3 depressive symptoms (b path; b = -0.03, p = .96). The final multilevel model testing the effects of all predictor variables on Time 3 depressive symptoms again revealed that only the main effect of Time 1 depressive symptoms (b = 0.77, p < .001) was significantly predictive of Time 3 depressive symptoms, and mediation could not be tested. This suggests that, even when only testing same-gender dyads, the effect of romantic involvement on later depressive symptoms still was not mediated by observed co-rumination.

Figure 1b Panel B

Multilevel model including same gender dyads only

Note. Values presented in the figure indicate unstandardized beta (b) values for each tested path (i.e., a, b, c). Solid lines indicate significant main effects ≤ .05, while dashed lines indicate nonsignificant values. Depressive symptoms at Time 1 were controlled when testing each path of the model.
**Aim 2: For those Youth in a Romantic Relationship, Examine Whether the Effect of Positive Romantic Relationship Quality on Later Depressive Symptoms is Mediated by Co-rumination**

**Analysis strategy.** Multilevel mediation models were next tested in the subset of youth who reported being in a romantic relationship at Time 1 \( (n = 77) \). Specifically, models tested whether the association between positive romantic relationship quality at Time 1 and depressive symptoms at Time 3 was mediated by co-rumination. Separate models were tested for self-reported co-rumination (Aim 2a) and observed co-rumination (Aim 2b), and Time 1 depressive symptoms were controlled in each model.

**Hypotheses.** It was hypothesized that the association between self-reported positive romantic relationship quality at Time 1 and self-reported depressive symptoms at Time 3 would be mediated by self-reported co-rumination at Time 1, such that lower levels of Time 1 positive romantic relationship quality would predict higher levels of Time 1 self-reported co-rumination, which would predict increased depressive symptoms at Time 3 (2a). Similarly, it was hypothesized that lower levels of Time 1 positive romantic relationship quality would predict higher levels of Time 2 observed co-rumination, which would then predict increased depressive symptoms at Time 3 (2b).

**Results. 2a (whole sample).** Separate multilevel regression models tested each path of the mediation model. First, Time 3 depressive symptoms were predicted from Time 1 positive romantic relationship quality, controlling for Time 1 depressive symptoms (c path). The main effect of Time 1 depressive symptoms was significant \( (b = 0.69, p < .001) \), but the main effect of Time 1 positive romantic relationship quality was not significant \( (b = 2.39, p = .16) \). In the a path model, neither the effect of Time 1 positive romantic relationship quality \( (b = 0.11, p = .52) \) nor the effect of Time 1 depressive symptoms \( (b = 0.003, p = .772) \) on self-reported co-rumination were significant. The b path in this model is identical to the b path in model 1a in
which a significant effect was observed for both Time 1 self-reported co-rumination (b = 1.69; < .001) and Time 1 depressive symptoms (b = 1.69, < .05) on Time 3 depressive symptoms. In the final model including all predictors, only the effect of Time 1 depressive symptoms on Time 3 depressive symptoms was significant (b = 0.69, < .001). Given that neither the a path nor the b path were significant, mediation could not be tested.

**Figure 2a Panel A**

Multilevel model including *whole sample*

![Diagram](image)

*Note.* Values presented in the figure indicate unstandardized beta (b) values for each tested path (i.e., a, b, c). Solid lines indicate significant main effects < .05, while dashed lines indicate nonsignificant values. Depressive symptoms at Time 1 were controlled when testing each path of the model.

**2a (same-gender dyads only).** When analyses only included same-gender dyads, results of testing the c path remained unchanged, such that Time 1 depressive symptoms (b = 0.71, p < .001) but not positive romantic quality (b = 2.27, p = .24) significantly predicted Time 3 depressive symptoms. In the a path model, neither the effect of Time 1 positive romantic relationship quality (b = 0.15, p = .42) nor the effect of Time 1 depressive symptoms (b = .002, p = .83) on self-reported co-rumination were significant, which is consistent with analyses testing
all dyads. Results from testing path b were consistent with previous analyses, such that both the
effects of Time 1 depressive symptoms (b = 0.74, p < .01) and Time 1 self-reported co-
rumination (b = 1.72, p < .05) on Time 3 depressive symptoms were significant. Only Time 1
depressive symptoms significantly predicted Time 3 depressive symptoms in the final model, and mediation could not be tested. These results are consistent with those from analyses including all dyads, which suggests no differences when excluding dyads with friends of heterogeneous gender identities.

Figure 2a Panel B

*Multilevel model including same-gender sample only*

Note Values presented in the figure indicate unstandardized beta (b) values for each tested path (i.e., a, b, c). Solid lines indicate significant main effects ≤ .05, while dashed lines indicate nonsignificant values. Depressive symptoms at Time 1 were controlled when testing each path of the model.

2b (whole sample). An identical set of multilevel models were tested using Time 2 observed co-rumination as the mediator, and similar results were observed. Recall that path c results are identical in models testing self-reported and observed co-rumination as the mediator and that Time 1 positive romantic quality did not significantly predict changes in depressive
symptoms at Time 3 ($b = 2.90; p = .16$). Results from testing the path a model indicated that neither Time 1 depressive symptoms ($b = 0.004; p = .72$) nor Time 1 positive romantic quality ($b = -0.10; p = .54$) significantly predicted Time 2 observed co-rumination. Recall also that the effect of observed co-rumination on Time 3 depressive symptoms was not significant ($b = -0.12, p = .84$), and, as such, mediation could not be tested.

**Figure 2b Panel A**

*Multilevel model including whole sample*

![Diagram](image)

*Note.* Values presented in the figure indicate unstandardized beta ($b$) values for each tested path (i.e., $a$, $b$, $c$). Solid lines indicate significant main effects $<.05$, while dashed lines indicate nonsignificant values. Depressive symptoms at Time 1 were controlled when testing each path of the model.

**2b (same-gender dyads only).** Similar results were observed in the model testing observed co-rumination in the sample of same-gender dyads. Results from testing the path a model indicated that Time 1 depressive symptoms ($b = 0.01, p = .36$) significantly predicted observed co-rumination, but Time 1 positive romantic relationship quality ($b = -0.13, p = .48$) did not. In the b path model, only Time 1 depressive symptoms ($b = 0.78, p < .001$) significantly predicted Time 3 depressive symptoms, but the effect of Time 2 observed co-rumination was not
significant ($b = -0.03, p = .96$). Thus, mediation was again not tested. Again, results mirrored those including all dyads, suggesting no meaningful differences when same-gender dyads were tested alone.

Figure 2b Panel B

Multilevel model including same-gender sample only

![Diagram](image)

Note. Values presented in the figure indicate unstandardized beta ($b$) values for each tested path (i.e., $a$, $b$, $c$). Solid lines indicate significant main effects $< .05$, while dashed lines indicate nonsignificant values. Depressive symptoms at Time 1 were controlled when testing each path of the model.

Aim 3: Examine Whether the Association between Romantic Relationship Involvement and Later Depressive Symptoms via Co-rumination is Moderated by Positive Friendship Quality

Analysis strategy. A series of multilevel, moderated mediation models were tested to address whether the effect of romantic relationship involvement at Time 1 on depressive symptoms at Time 3 via co-rumination was moderated by Time 1 positive friendship quality. Specifically, moderation of the $c$ path was tested. A separate series of models were tested for self-reported co-rumination (Aim 3a) and observed co-rumination (Aim 3b), and T1 depressive
symptoms were controlled in each model. For parsimony, separate figures displaying results from each are not presented; results from each model are presented only in the text.

**Figure 3**

*Visual depiction of moderated path of positive friendship quality*

**Hypotheses.** It was expected that the association between self-reported romantic relationship involvement at Time 1 and depressive symptoms at Time 3 would be mediated by Time 1 self-reported co-rumination, and that this mediated effect would be further qualified by moderation of the direct effect by self-reported levels of Time 1 positive friendship quality (moderated c path). Specifically, the path between romantic involvement and depressive symptoms was expected to be stronger for those with lower levels of positive friendship quality (3a). A similar pattern of results was expected for observed co-rumination (3b).

**Results. 3a (whole sample).** Given hypothesized mediation of the direct effect of romantic involvement on later depressive symptoms, a multilevel model was first tested to determine whether the direct effect of Time 1 romantic involvement on Time 3 depressive
symptoms (controlling for Time 1 depressive symptoms) was moderated by Time 1 positive friendship quality. Specifically, a model was tested in which Time 3 depressive symptoms were predicted from Time 1 depressive symptoms, Time 1 romantic involvement, Time 1 self-reported co-rumination, Time 1 positive friendship quality, and the interaction between Time 1 romantic involvement and Time 1 positive friendship quality.

Results suggested significant main effects of self-reported co-rumination (b = 1.66, \( p < .05 \)) and Time 1 depressive symptoms (b = 0.75, \( p < .001 \)). However, neither Time 1 friendship quality (b = -0.07, \( p = .93 \)) nor Time 1 romantic involvement (b = -2.63, \( p = .61 \)) significantly predicted depressive symptoms at Time 3. Moreover, the interaction between Time 1 positive friendship quality and Time 1 romantic involvement was not significant (b = 0.82; \( p = .58 \)). This indicates that levels of reported positive friendship quality did not change the relation between Time 1 romantic involvement and Time 3 depressive symptoms. Given that positive friendship quality did not impact the direct effect from the basic model tested in Aim 1 (see above), and that the direct effect in models for both hypothesis 3a and 3b were identical, no additional mediation analyses were conducted.

3a (same-gender dyads only). Again, analyses were tested with only same-gender dyads. As in the previous results, there was a significant main effect of self-reported co-rumination (b = 1.49, \( p < .05 \)) and Time 1 depressive symptoms (b = 0.75, \( p < .001 \)) on Time 3 depressive symptoms, but the effects of romantic involvement (b = -0.10, \( p = .99 \)), positive friendship quality (b = 0.69, \( p = .38 \)), and the interaction of romantic involvement and positive friendship quality (b = 0.004, \( p = .99 \)) were not significant.

3b (whole sample). A similar set of models tested whether a significant main effect of Time 1 positive friendship quality was revealed when the model included observed co-rumination as the mediator. The effects of romantic involvement (b = -1.63, \( p = .757 \)) and
positive friendship quality ($b = 0.64, p = .366$) on Time 3 depressive symptoms were not significant. Moreover, the interaction between positive friendship quality and romantic involvement on Time 3 depressive symptoms was not significant ($b = 0.55, p = .71$), and the only significant effect detected was Time 1 depressive symptoms ($b = 0.78, p < .001$).

3b (same-gender dyads only). Models testing observed co-rumination as the mediator revealed similar results, such that the effects of romantic involvement ($b = 2.27, p = .716$), positive friendship quality ($b = 1.39, p = .065$), and the interaction between positive friendship quality and romantic involvement on Time 3 depressive symptoms were not significant ($b = -0.48, p = .78$). Again, the only significant effect was Time 1 depressive symptoms ($b = 0.77, p < .001$). Together, this suggests that results did not differ when testing all dyads compared with only same-gender dyads.

**Aim 4: Examine Whether the Association between Romantic Relationship Involvement and Later Depressive Symptoms via Co-rumination Depended on Whether or Not Romantic Experiences are Discussed with Friends**

**Analysis strategy.** Multilevel, moderated mediation models were tested to address whether the association between romantic relationship involvement at Time 1 and depressive symptoms at Time 3 is mediated by co-rumination, and whether this mediated effect differs as a function of whether friends are observed to engage in problem talk about their romantic experiences. Models tested this effect for both self-reported (**Aim 4a**) and observed co-rumination (**Aim 4b**), and Time 1 depressive symptoms were controlled in each model. Again, separate figures displaying results from each are not presented; results from each model are presented only in the text.
**Hypotheses.** It was expected that the association between self-reported romantic relationship involvement at Time 1 and self-reported depressive symptoms at Time 3 would be mediated by self-reported co-rumination at Time 1, and this mediated effect would be moderated by engagement in problem talk with friends about romantic experiences at Time 2. Specifically, the path between Time 1 self-reported co-rumination and Time 3 depressive symptoms was expected to be stronger for those who engaged in problem talk about romantic experiences with friends at Time 2 (4a). It was also expected that the path between Time 2 observed co-rumination and Time 3 depressive symptoms would be stronger for those who engage in problem talk about romantic experiences with friends at Time 2 (4b).

**Results. 4a (whole sample).** To test for moderation of the b path, the main effect of Time 2 observed romantic experience talk was added to the model in which Time 3 depressive symptoms were predicted from Time 1 self-reported co-rumination (controlling for Time 1 depressive symptoms). The main effects of both Time 1 depressive symptoms (b = 0.74; p < .001) and Time 1 self-reported co-rumination (b = 1.72; p < .05) were significant. However,
neither the main effect of Time 2 observed romantic experience talk (b = 0.66, p = .87), nor the interaction between Time 2 observed romantic experience talk and Time 1 self-reported co-rumination (b = 0.07, p = .96) were significant. This suggests that whether youth engaged in romantic experience talk did not change the impact of Time 1 self-reported co-rumination on increases in depressive symptoms at Time 3.

4a (same-gender only). Results in the sample of only same-gender dyads again suggested that Time 1 depressive symptoms (b = 0.73, p < .001) and self-reported co-rumination (b = 1.66, p < .05) significantly predicted Time 3 depressive symptoms, but not observed romantic experience talk (b = 0.94, p = .83), nor the interaction between co-rumination and observed romantic experience talk (b = 0.192, p = .90). Thus, the pattern of results was consistent regardless of including heterogeneous gender dyads.

4b (whole sample). Next, analyses tested whether Time 2 observed romantic experience talk moderated the association between Time 2 observed co-rumination and Time 3 depressive symptoms (controlling for Time 1 depressive symptoms). Results showed that the main effect of Time 1 depressive symptoms (b = 0.78, p < .001) was significant. Neither Time 2 observed co-rumination (b = 0.36, p = .57), nor Time 2 observed romantic experience talk (b = 2.09; p = .90) were significantly predictive of Time 3 depressive symptoms. However, the interaction of Time 2 observed co-rumination and Time 2 romantic experience talk was significant, (b = -3.48, p < .05), suggesting that romantic experience talk moderated the path from Time 2 observed co-rumination to Time 3 depressive symptoms.

To probe this interaction, a multilevel model in which Time 2 observed co-rumination predicted Time 3 depressive symptoms (controlling for Time 1 depressive symptoms) was tested separately for those who did and did not discuss romantic experiences during the problem talk task. Results indicated that for youth who did not discuss romantic experiences, observed co-
rumination did not significantly predict depressive symptoms at T3 ($b = 0.38; p = .54$), whereas the effect was marginally significant for those who did discuss romantic experiences ($b = -3.37, p = .088$). This suggests that the effect of observed co-rumination on increased depressive symptoms over time was likely driven by those who discussed romantic experiences with friends during the problem talk task.

4b (same-gender dyads only). Consistent with earlier analyses, results suggested that the effect of Time 1 depressive symptoms ($b = 0.75, p < .001$) significantly predicted Time 3 depressive symptoms, while the effect of observed co-rumination was not significant ($b = 0.56, p = .43$). However, different from those with the full sample, analyses revealed significant effects for both observed romantic experience talk ($b = 3.05, p < .05$) and the interaction between observed co-rumination and romantic experience talk ($b = -4.25, p < .05$). Again, the interaction was probed by testing separately those who did and did not discuss romantic experiences during the problem talk task. Results again indicated that for youth who did not discuss romantic experiences, observed co-rumination did not significantly predict depressive symptoms at Time 3 ($b = 0.96; p = .63$). However, when only testing same-gender dyads, analyses were also not significant for those who did discuss romantic experiences ($b = 0.56, p = .395$). This suggests that whether the effect of observed co-rumination on increased depressive symptoms is driven by those who discussed romantic experiences with friends during the problem talk task may differ in friendships in which friends do not have shared gender identities.

Aim 5: Assess Whether Gender Further Moderates all Pathways Hypothesized in Aim 1

Analysis strategy. Exploratory analyses were conducted to determine whether gender further moderated each path of the basic multilevel mediation model (Aim 1), in which initial romantic involvement predicted later depressive symptoms, mediated by either self-reported and/or observed co-rumination and controlling for initial depressive symptoms in each analysis.
Given the exploratory nature of these analyses, whether gender potentially moderated each path in the mediation model (a, b, c) was tested. As with the analyses testing gender difference, students who indicated that their gender fell outside of the gender binary (n = 9) were excluded from these analyses due the heterogeneity of participants and sample size. Figure 5 visually depicts each path for which gender moderation was tested, though moderation by gender of each of these paths was tested in separate models. Separate figures displaying results from each are again not presented; results from each model are presented only in the text for parsimony.

**Figure 5**

*Visual depiction of all possible gender moderation paths of Aim 5*

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**Hypotheses.** Given documented gender differences in both co-rumination and depressive symptoms indicating that girls consistently report higher levels of both in adolescence (e.g., Nolen-Hoeksema & Grgus, 1994; Rose, 2002), all hypothesized paths in the mediation models for both self-reported and observed co-rumination were expected to be stronger for girls.
**Results (whole sample).** To test these gender moderation hypotheses, the main effect of gender and the interaction of gender and the primary predictor in each model were added to the series of models testing the a, b, and c paths from Aim 1. With regard to the direct effect (c path) model, the main effect of gender was significant \((b = -3.56; p < .05)\), underscoring the mean-level gender differences in depressive symptoms observed in favor of girls (see Gender differences section, above). However, the interaction between Time 1 romantic involvement and gender was not significant \((b = 0.797 \ p = .74)\). In the models testing the a path (involving either self-reported or observed co-rumination), neither the main effect of gender (self-reported co-rumination model: \(b = -0.17, p = .20\); observed co-rumination model: \(b = 0.0009, p = .61\)) nor the interaction between gender and romantic involvement (self-reported co-rumination model: \(b = 0.35, p = .199\); observed co-rumination model: \(b = -0.002, p = .26\)) significantly predicted co-rumination. Similarly, in the analyses testing the b path (involving self-reported co-rumination), neither the main effect of gender \((b = 0.94, p = .75)\) nor the interaction between co-rumination and gender \((b = -1.63, p = .13)\) were significant. In the model testing the b path (involving observed co-rumination), the main effect of gender \((b = -3.56, p < .05)\) but not the interaction between gender and observed co-rumination \((b = 0.37, p = .77)\) was significant. Given no significant interactions with gender on any path in the mediation model, there is no evidence for gender moderating these effects.

**Results (same-gender dyads).** Analyses then were conducted with only same-gender dyads. Similar to earlier analyses, results of the model testing the c path revealed that the effect of gender on Time 3 depressive symptoms \((b = -3.78, p < .05)\) was significant, while the interaction between Time 1 romantic involvement and gender was not significant \((b = 0.33 p = .898)\). Results of the model testing the a path (involving self-reported co-rumination) indicated that both the main effect of gender on co-rumination \((b = -0.18, p = .20)\) and the interaction
between gender and romantic involvement (\( b = 0.31, p = .30 \)) were not significant. However, a path results from the observed co-rumination model suggested a significant effect of gender on observed co-rumination (\( b = -0.49, p < .05 \)), but not the interaction between gender and romantic involvement (\( b = -0.001, p = .26 \)). Again, the b path results in the self-reported co-rumination model indicated that neither gender (\( b = 1.7, p = .96 \)) nor the interaction between co-rumination and gender (\( b = -1.45, p = .198 \)) significantly predicted Time 3 depressive symptoms. In the b path model involving observed co-rumination, the main effect of gender was no longer significant (\( b = 0.167, p = .96 \)) along with the interaction between gender and observed co-rumination (\( b = -1.45, p = .198 \)). Again, there were no significant interactions with gender on any path in the mediation model, and as such, no evidence for gender moderating these effects. Thus, the pattern of results was consistent regardless of including heterogeneous gender dyads.
CHAPTER 4: DISCUSSION

Given the salience of peer relationships during adolescence (e.g., Collins, 2003), the chronicity of adolescent-onset depression (e.g., Birmaher et al., 2004), and theory to support interpersonal risk factors as both triggers and maintenance factors in depression (e.g., Coyne, 1976; Joiner, 1999), the present study aimed to extend understanding of risk factors for depressive symptoms at this developmental stage. In particular, this study examined a theory outlined by Davila (2008), suggesting that romantic experiences may prompt increased emotional distress and, consequently, increase problems to discuss with friends.

Literature suggests that adolescents in romantic relationships are at an increased risk for depressive symptom development (Davila, 2008; Davila et al., 2004; Ha et al., 2014; Joyner & Udry, 2000) and that they engage in more co-rumination with friends, particularly adolescent girls (e.g., Starr & Davila, 2009). There is further evidence that romantically involved girls who engage in co-rumination may be at even greater risk for depressive symptoms (Starr & Davila, 2009), although the mechanisms of this association have not yet been examined. As Davila (2008) posited, the stress of romantic involvement may evoke ineffective social coping, including co-rumination, which occurs most commonly in female friendships and is linked to elevated depressive symptoms (Rose, 2002; Rose et al., 2014). However, given the limited number of studies, and particularly longitudinal studies, which test these propositions, the directionality of the association between romantic involvement, depressive symptom development, and co-rumination has been unclear. Moreover, no studies to date had considered differences between observed and self-reported co-rumination as a mechanism of the link between romantic involvement and depressive symptom development.
The current study offers information to expand understanding of the links between adolescent romantic experiences, depressive symptoms, and co-rumination. Using a multi-method, longitudinal study design, the present study examined whether co-rumination (self-reported and observed) mediated the relationship between romantic involvement and depressive symptoms over time (Aim 1) and whether this process was moderated by positive friendship quality (Aim 3), whether youth discuss romantic experiences during problem talk with friends (Aim 4), and/or gender (Aim 5). Initially, the author intended to also examine whether this process was mediated by romantic relationship quality. However, redundancy in the romantic involvement variable and romantic relationship quality variable (i.e., only adolescents reporting involvement in a romantic relationship provided romantic relationship quality data) necessitated testing a model with only one romantic variable. As such, the current study also considered whether romantic relationship quality among romantically involved youth influenced depressive symptoms over time via co-rumination (Aim 2).

Notably, the literature is limited by often only including friends of the same gender to measure quality of and engagement in co-rumination. Thus, analyses were conducted with and without including friendship dyads in which youth reported different gender identities. The following discussion will first describe the findings and associated directions for future research. Then, limitations of the present study as well as additional directions for future research will be discussed. Finally, potential implications of the current findings are explored.

**Does Romantic Relationship Involvement Predict Later Depressive Symptoms via Co-rumination?**

The present study first aimed to replicate previous findings that romantic involvement is linked to depressive symptom development (e.g., Davila et al., 2004; Starr & Davila, 2009). It was hypothesized that self-reported co-rumination would mediate this association. Unlike
previous findings, results indicated that whether or not youth were in a romantic relationship (i.e., romantic involvement) was not significantly associated with changes in depressive symptoms at Time 3. These findings were identical for same-gender dyads and for the full sample, which included mixed-gender dyads. Given the significant concurrent association between Time 1 romantic involvement and Time 1 depressive symptoms, it may be that the longitudinal association between involvement and depressive symptoms is weaker. Moreover, although post-hoc analyses indicated that the sample was sufficiently powered to detect an effect size of .15 with an alpha of .05, only 24% of youth were romantically involved in this sample. This subset of youth in romantic relationships were nearly evenly split between the public and private high schools involved in data collection, suggesting no significant differences in prevalence across type of school. Future research using a selected sample of romantically-involved youth might be even better powered to detect significant effects and would further allow for more detailed analysis of their experiences.

However, it must be noted that much of the current literature relies on prevalence estimates of romantic involvement that are outdated and estimating romantic involvement within the last 18 months (e.g., Furman et al., 2009; Joyner & Udry, 2000). As such, the estimates found in the current study may be lower due to being a point estimate rather than an estimate of involvement at any time over the year. It is also possible that these rates are more fitting with the few recent studies that have reported romantic involvement prevalence, suggesting an accurate reflection of recent changes in dating trends of youth. For example, in a nationally representative sample of teens (National Survey of Sexual Health and Behavior; age range: 14-17 years), Beckmeyer and colleagues (2020) found that more teens (55.8%) reported engaging in romantic activity as compared to endorsing a romantic relationship (32.9%). Perhaps the lower rates of romantically-involved youth in this study (as well as in recent studies) reflects a mismatch in
language used on research measures and the evolving language that youth are using to describe their relationships (Olmstead, 2020). Moreover, perhaps generational shifts towards normalization and reduced stigma of sexual identity exploration (e.g., Olmstead, 2020; Russell & Fish, 2020) have contributed to reduced interest/pressure to become involved in an exclusive and/or identified romantic relationship.

Nevertheless, romantic involvement significantly predicted self-reported co-rumination, which then predicted depressive symptoms over time, and this indirect effect of romantic involvement on later depressive symptoms via self-reported co-rumination was significant. That is, youth in a relationship may be more prone to depressive symptoms when they engage in more self-reported co-rumination. Interestingly, this mediational effect was not supported when observed co-rumination was tested as a mediator, both in the full sample and with only same-gender dyads.

To the writer’s knowledge, this is the first study to involve the association between romantic involvement and observed co-rumination; the few studies that have examined romantic involvement and co-rumination have been limited to self-reported co-rumination (Starr & Davila, 2009). Moreover, although literature supports that observed and self-reported co-rumination are associated with one another (Davidson et al., 2014), less research has examined the overlap of these constructs. Given that observed co-rumination is measured by outside raters and within a particular friendship, perhaps self-reported co-rumination captures a different aspect of co-rumination. Although self-reported and observed co-rumination were significantly positively linked, it is possible that self-reports of general interpersonal tendencies and small slices of observed behavior provide different pieces of information about adolescents’ co-rumination. It is also possible that, because not all participants could be paired with a friend for the observational task, the smaller number of participants with observational data could have accounted for this
difference. More research that involves both self-reported and observational measures of co-rumination, and a larger sample of dyads for the observational co-rumination task, are needed to best understand these findings.

Moreover, there are important differences in study design and in the directionality of effects tested in this study versus the design and effects tested in past studies. Starr and Davila (2009) included a female-only sample and only utilized a measure of self-reported co-rumination, as the observational coding system had not yet been developed. Moreover, authors used a measure of romantic experiences rather than romantic involvement. As outlined in Davila’s (2008) theoretical review, there is theory to support testing either co-rumination (e.g., Rose, 2002) or romantic involvement (e.g., Davila, 2007) as a predictor of depressive symptoms and very few studies have tested a mediation model including co-rumination. Future research could test whether self-reported co-rumination predicts depressive symptoms, mediated by romantic involvement to better understand the direction of the association. Moreover, testing romantic experiences (rather than romantic involvement alone) may capture a wider range of romantic stressors that could contribute to depressive symptoms.

**Role of Positive Friendship Quality**

Next, this study aimed to investigate the potential impact of friendship quality in the mediated relation between romantic relationship involvement, depressive symptom development, and co-rumination in adolescence. Given that friendships can be a key source of support at adolescence (Roisman et al., 2004), particularly when managing and coping with problems related to romantic relationship formation (e.g., Seiffge-Krenke, 2011), it was anticipated that romantically-involved adolescents who endorsed lower levels of positive friendship quality would experience greater increases in depressive symptoms at Time 3 via co-rumination. However, hypotheses were not supported in models testing observed nor self-reported co-
rumination, regardless of whether the gender composition of friendship dyads was the same or mixed. These results were somewhat surprising given literature to support a link between positive friendship quality as a potential buffer for depressive symptom development (Szwedo et al., 2015), particularly for romantically-involved youth and girls (Seiffge-Krenke, 2011). It may be that suppression effects were present in these models, given the positive association of positive friendship quality and co-rumination, juxtaposed with the positive linkages of romantic involvement and co-rumination with depressive symptoms.

Upon closer look, even some results at the correlational level were unexpected. For instance, positive friendship quality was significantly, positively associated with more engagement in self-reported co-rumination, but not observed co-rumination. Thus, despite a moderately significant association between observed co-rumination and self-reported co-rumination, results suggested a stronger link between self-reported co-rumination and positive friendship, which may be indicative of differences in constructs.

Moreover, as is sometimes the case (see Schwartz-Mette et al., 2020 for review), a positive correlation between positive friendship quality and depressive symptoms was observed in this sample. The literature predominantly suggests that positive friendship quality could be quite protective for wellbeing in adolescence, when intimacy in friendships is particularly salient (e.g., Weiss, 1973). Perhaps in older adolescent samples, such as this one, youth experience more supportive friendships when they are experiencing higher depressive symptoms. It may also be that associations would emerge as hypothesized, were the associations between both indices of co-rumination and positive friendship quality and the association between depressive symptoms and positive friendship quality to have been observed as hypothesized.

What is more, consideration of additional indices of friendship functioning in future studies may shed light on the role of friendships in providing support for romantic relationships.
As with romantic relationships, there are multiple ways of assessing friendship functioning (e.g., involvement, positive qualities, negative qualities). Researchers have suggested that various aspects of friendship functioning should be examined separately from one another as research has shown that they do not always correlate and may have differential salience for depressive symptom development. For instance, negative experiences with friends may have a stronger impact on depressive symptoms than positive experiences (Schwartz-Mette et al., 2020). It is possible that other friendship features aside from positive friendship quality (e.g., friendship conflict) have differing effects but research has not yet examined this. Thus, further research is needed to better understand these results.

**Role of Romantic Problem Talk Between Friends**

Next, this study examined whether there was a stronger relationship between co-rumination and later depressive symptoms via co-rumination for youth who discussed romantic experiences with friends during the observed problem talk task. As outlined in the theory proposed by Davila (2008), romantically involved adolescents, and especially girls, may experience more problems that they discuss with friends, which may explain their increased engagement in co-rumination and subsequent depressive symptom development. Given literature to support that adolescents seek more support for romantic problems from friends compared to other social supports (i.e., parents), this may partially explain their vulnerability for depressive symptom development.

Hypotheses were not supported for self-reported co-rumination regardless of whether tests involved the full sample or only same-gender dyads. Findings initially appeared to support the hypothesis that talking about romantic experiences moderated the path from observed co-rumination to depression, such that the interaction of co-rumination and romantic problem talk predicting depressive symptoms at Time 3 was significant. However, upon closer examination of
the association in the sample of teens who did or did not discuss romantic experiences, the association between observed co-rumination and depression did not reach significance for either group when tested among same-gender dyads. When tested in the full sample of youth, a marginally significant effect was detected for those who discussed romantic experiences.

These findings suggest that, if the subsamples were larger (i.e., 40.6% discussed romantic experiences), more of the simple slopes may have reached significance and this moderated effect could be better clarified. It is also possible that the model testing self-reported co-rumination was not supported due to differences in youths’ self-reported co-rumination behaviors as compared to an outside observer. It may instead be that observed co-rumination is naturally more related to romantic problem talk due to the fact that they were measured within the same task (shared method variance). Future studies could assess self-reported romantic problem talk to clarify this.

**Role of Gender**

Analyses finally tested whether gender differences moderated the links between romantic involvement and depressive symptoms via co-rumination. It was expected that all paths in the mediation model would be stronger for girls. Given documented gender differences in co-rumination and depressive symptoms indicating that girls consistently report higher levels of both in adolescence (e.g., Nolen-Hoeksema & Girgus, 1994; Rose, 2002) and especially for those girls in a romantic relationship (Starr & Davila, 2009), it is somewhat surprising that gender did not moderate any path in the model. These results were consistent regardless of whether observed or self-reported co-rumination was tested as a mediator, and whether same-gender dyads were tested exclusively.

Although support for gender moderation of each path in the mediation model was not found, important mean-level gender differences were observed, consistent with past research. For example, girls reported, on average, more depressive symptoms (initially and 3 months later) and
self-reported co-rumination, and, when male and female dyads were compared, females were observed to engage in more co-rumination than males. However, taken together, results from the self-reported and observed co-rumination models indicate that associations among romantic involvement, co-rumination, and depressive symptoms appear to operate similarly across gender groups.

**Does Romantic Relationship Quality Predict Later Depressive Symptoms Via Co-rumination?**

As noted, it was initially planned to test whether romantic relationship quality moderated the basic mediation model described above. However, given that only youth in romantic relationships were able to contribute romantic relationship quality data, there was redundancy in the romantic involvement variable and in the romantic relationship quality variable, such that only one of these variables could be included in the statistical models at one time. Thus, a model was tested in which romantic relationship quality predicted later depressive symptoms, via co-rumination.

Researchers have posited that the influence of romantic relationship involvement may be difficult to tease apart from the quality of such relationships, and that it is possible that romantic relationship quality could be more indicative of depressive symptom development (e.g. La Greca & Harrison, 2005). However, it was not well understood whether romantic relationship quality is differentially related to engagement in co-rumination and worsening depressive symptom development. Findings from the current study ultimately did not support co-rumination as a mediator of the association between positive romantic relationship quality and depressive symptoms at Time 3, regardless of whether observed or self-reported co-rumination was tested and whether analyses included the whole sample or only same-gender dyads. Findings were not
significant for any path of the model, including the direct path from romantic relationship quality to depressive symptoms at Time 3.

Analysis of bivariate relations may provide important new information about the romantic relationship quality variable as it relates to socioemotional adjustment in adolescence. To the writer’s knowledge, this is the first study to examine the link between positive romantic relationship quality and co-rumination. Results did not support a significant bivariate relation between positive romantic relationship quality and either observed nor self-reported co-rumination. Again, this result is possibly reflective of a small subsample of youth who endorsed involvement in a romantic relationship. Moreover, although research suggests that having fewer positive qualities of a romantic relationship and more negative qualities are often strongly associated, this is not always the case (Collins et al., 2009). It is possible that negative romantic relationship qualities (rather than levels of positive romantic relationship quality) are more indicative of whether youth engage in co-rumination, given that negative aspects of romantic experiences (e.g., conflict) could more likely drive problem-talk behavior.

Moreover, bivariate relations were not detected between positive romantic relationship quality and depressive symptoms concurrently or over time. This is somewhat surprising given findings in the literature (albeit small) that exists regarding adolescent romantic relationship quality and depressive symptoms, but most of these findings have been derived from concurrent studies (e.g., La Greca & Harrison, 2005). One study that examined the longitudinal influence of romantic relationship quality in adolescence did find a significant effect on depressive symptom development in adulthood (Kansky & Allen, 2018). However, this study included an observational measure of romantic relationship support and a measure of depressive symptoms that was amalgamated with other internalizing symptom measures.
Notably, this study only tested self-reported positive romantic relationship quality, from the perspective of one adolescent in the relationship. As previously noted, although positive quality is considered a salient aspect of romantic relationship quality (Poulsen, 2016 as cited by Kansky & Allen, 2018), future studies should examine the potential role of negative romantic relationship qualities as well as global measures of quality to determine if these indices help to elucidate the link between involvement and depressive symptom development in adolescence. It is also possible that these findings simply reflect the small sample of youth who were in romantic relationships and able to report on their relationship quality. Additionally, because romantic relationship involvement was only assessed from the perspective of the adolescent involved in the study, the reciprocity of these relationships were not verified as were with friendships. It is possible this could have impacted the nature of relationships reported.

**Limitations and Future Directions**

Several limitations of the current study, some of which have been previously mentioned, warrant discussion and point to important directions for future research. First, the current study was not specifically designed to recruit romantically-involved youth and, as such, the small sample of romantically-involved youth may have limited the power to detect particular effects. Thus, this limits the strength of conclusions that can be drawn. For example, the sample was underpowered to test moderated gender paths in all but the first aim. This is important to address in future research with the recruitment of larger sample sizes. Moreover, there was no predetermined inclusion criteria regarding length of the romantic relationships for youth in the study. Although there is no consensus in the literature regarding inclusion criteria for length of romantic relationships, the length of romantic relationship could impact its connection to depressive symptom development. Future studies should aim to recruit equal groups of romantically involved and uninvolved adolescents and control for length of relationship. Future
research could also aim to clarify whether there are differences in the link between youth who experience romantic relationship specific stress as compared to romantic experience stress (e.g., crushes) as it connects with depression and co-rumination.

Moreover, this study focused on high school-age youth, and future research should explore whether findings generalize to younger teens. It is possible that younger romantically-involved youth may experience a greater impact of engaging in co-rumination on their depressive symptoms, given research to suggest romantic involvement can be especially predictive of psychological risk at this stage when they are less established or normative among peers (e.g., Furman et al., 2009). Perhaps having positive friendship quality is especially meaningful as a buffer for negative consequences for younger adolescents in romantic relationships.

Further, youths’ endorsements of depressive symptoms fell within the mild range on average in this study, consistent with other adolescent community samples (e.g., La Greca & Harrison, 2005, Starr & Davila, 2010). Given that a large proportion of studies have examined depressive symptoms and romantic involvement within a community sample (e.g., Compian et al., 2004, Joyner & Udry, 2000; Davila, 2008; Davila et al., 2004; Ha et al., 2014), this is not only a limitation within this study but the greater literature and likely diminished effects across each of the models. Moreover, this limits the generalizability of findings to a clinical sample. Future research should be conducted in a sample with clinically significant levels of depressive symptoms to understand this further.

Additionally, the study was not designed to test differences between same-gender and different-gender friend pairs. The current study was unique in testing for differences in results when excluding friendship dyads including youth of heterogeneous gender identities. Much of the literature to date has limited study inclusion criteria to same (binary) gender friendship pairs.
for the observational task (e.g., Rose et al., 2014). Given that a notable number of adolescents in this study indicated that they did not identify within the gender binary and/or identified friends of a different gender, it was of interest to understand if hypothesized associations might perform differently in the various groups. Findings did not drastically change when comparing the full sample of same- and mixed- gender (including youth identifying outside of the gender binary) friendship dyads with the same-gender dyads sample. Although able to make a contribution to the literature by having detected few differences in outcomes, future research should more directly address comparisons by looking at matched samples of same and mixed-gender friendship pairs.

What is more, the current study cannot speak to potential gender identity differences for non-binary youth. This is very important, given that the research literature largely excludes these gender-diverse youth. Future studies should aim to recruit more gender-diverse youth in friendship dyads to be able to meaningfully understand differences in their peer experiences, engagement in co-rumination, and depressive symptom development.

The methods used to assess co-rumination and romantic problem talk also point to important future directions. The use of a novel measure of romantic experience problem talk during the observational co-rumination task is a unique contribution of this study. This included any romantic experience topic (e.g., breakups, crushes) assessed for each individual in the task and was not limited only to youth in a current romantic relationship, which allowed for broad analysis of romantic problems. Indeed, findings suggested that discussing romantic problems somewhat strengthened the link between increased engagement in observed co-rumination and depressive symptoms among romantically-involved youth. However, this measure only assessed the dichotomous presence of romantic problem talk. Further, it was not assessed whether
identified romantic problem talks occurred during time that youth were engaged in co-rumination.

Future research should include more nuanced coding features, such as length of romantic problem talk compared to other problem topics (e.g., academic problems). Although the likert observational coding system developed by Rose and colleagues (2014) was used in this study, the original study also involved a breakdown of thought units within the conversation to determine breaks in topics and more specific problem-talk. Future research could utilize this approach to assess romantic problem talk and more clearly understand the extent to which youth engage in romantic co-rumination (rather than problem talk alone). Moreover, perhaps other methodology of considering whether romantic talk is discussed should be utilized, such as ecological momentary analysis (EMA) techniques as an ecologically valid way to understand whether youths’ report of romantic problem talk differs from observations (Waller et al., 2014).

**Clinical Implications**

These findings may have implications for clinical practice. For instance, that self-reported co-rumination mediated the link between romantic involvement and depressive symptoms over time adds to evidence that co-rumination may be a worthy target of prevention and intervention programs. Despite evidence of the tradeoffs of engaging in co-rumination, research has not yet been integrated into educational wellness programming or coping skills to prevent depressive symptom development. This research could extend evidence-based approaches for adolescents with depressive symptoms (e.g., cognitive-behavioral therapy, dialectical behavior therapy) by highlighting ways that the behavior of co-ruminating impacts ones’ thoughts and depressed mood. For example, a clinical intervention could include challenging negative automatic thoughts about romantic problems and noticing the impact on feelings as compared to feelings after co-ruminating. Findings could also be utilized in helping
youth distinguish between interpersonally effective and ineffective ways of support-seeking. For instance, dialectical behavior therapy skills that target interpersonal effectiveness strategies for effectively making requests of others or saying no/setting boundaries could increase youths’ problem-solving skills in romantic relationships (Rathus & Miller, 2014).

The study also confirmed, observationally, that many adolescents discuss romantic issues with friends. Although this is largely expected, this further points to the potential need to bolster youths’ effectiveness in discussing these problems with friends. More research is needed, but it is possible that co-ruminating about romantic problems increases their sense that the problems cannot be solved. This may be another important area to inform prevention and intervention treatments. For example, therapeutic skills could be developed aimed at effectively support-seeking when romantic distress is prompting or exacerbating depressive symptoms. Similarly, equipping youth with skills to effectively respond to friends experiencing such distress could be protective for both parties.

**Conclusion**

Together, findings from this study add some initial intriguing information to expand our understanding of the links between peer experiences and depressive symptom development in adolescence. The literature on adolescent romantic experiences is limited by having few longitudinal studies, particularly examining the link between romantic involvement and depressive symptom development (e.g., Davila, 2008). Moreover, the use of multiple methodologies, especially assessing co-rumination, is unique; few studies to date include both observational and self-report measures of co-rumination and none assess this with regard to the link between depressive symptoms and romantic involvement. Clarifying youths’ use of effective or ineffective support-seeking strategies in response to romantic experience stress could eventually inform evidence-based interventions for treating depressive symptoms (e.g., cognitive
behavioral strategies). For example, teaching youth strategies to notice and prevent co-rumination about romantic topics, along with psychoeducation about other coping skills for distress, could be added to the current treatment strategies. Given the recurrent nature of adolescent-onset depressive symptoms, this research area is deserving of further attention and may inform treatment approaches for adolescent depression.
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APPENDICES

Appendix A

Parental Consent Forms (hard copy or Qualtrics survey), school-specific

Building Interpersonal Resilience and Community Health (BIRCH) Project
Parent/Guardian Consent Form
Principal Researcher: Rebecca Schwartz-Mette, PhD.

Your child is invited to participate in a research project being conducted by Dr. Rebecca Schwartz-Mette, a faculty member in the Department of Psychology at the University of Maine. The purpose of this study is to learn how friends act with one another and how friends make one another feel better when one has a problem. The goal of the project is to help youth have healthy relationships and feel good about themselves. Your child has been asked to participate because he/she is a student in grades 5 through 12. Written permission from you is required for your child to participate.

Before you consider the research, you should be aware of the following information:

- This research is voluntary. Your child does not have to be in this study.
- Your child will complete three surveys (45 minutes each) about their friends, feelings, and behaviors.
- Your child will participate in a 20-minute conversation task with a friend. This part will be video recorded.
- Your child will answer three brief daily surveys (3 minutes per day) for one week. They may use their own smartphone or borrow one from the research team (at no cost) for this part.
- Your child may enjoy participating in this research with friends and will earn a gift card for participating.
- If you think your child wants to be in this study, you should read the rest of this document for more information about what happens in this study.

What Will My Child Be Asked to Do?
Your child’s participation would involve:

- Questionnaires: Participants will complete questionnaires during school time 3 times during the year (fall, winter, and spring; 40 minutes each; during advisory/homeroom time)
- Interaction with a friend: Participants will complete a social interaction task with a friend of their choosing outside of school time (fall; 20 minutes; during or after school).
- Daily text surveys: Participants will complete daily surveys over text message for 1 week in the spring (approximately 3 minutes per day during this week).

The questionnaires ask about the way youth act with other people their age (for example, how they talk about problems with their friends and how they support one another), how youth feel about themselves (for example, whether they feel anxious, whether they enjoy spending time with other people their age, and whether they generally feel happy or more depressed), and what youths’ friendships are like (for example, how happy youth are with their friendships). Youth also will indicate who their friends are, who their best friend is, and who their romantic partner is
(if applicable) from a class roster. This part will take about 40 minutes and will be completed during students’ homeroom/advisory periods during the school day.

The social interaction task involves your child and their friend interacting with one another. We will videorecord the interactions, which will include your child talking with their friend about fun things to do with other kids their age, problems they have had recently, and/or anything else they want to talk about. They may also work together on a project, like a puzzle. We will stop their interaction if either youth becomes upset or if there is a conflict. This part will take about 20 minutes and will be completed during or after the school day at a designated place within the school (e.g., classroom).

The daily text surveys ask questions about youth’s interactions with friends, what they talk about with their friends, and how they feel after the interactions. Participants will be texted a link to the brief surveys, which will take about 1 minute each. Youth will complete 3 surveys a day for 7 days in the spring. The estimated daily time commitment is about 3 minutes per day. If youth do not have a smartphone with text capability and internet access, our research team will loan youth a phone with a data plan for these weeks. Phones will be returned to the research team at the end of the week.

**Risks**

Participating in this project is not expected to make youth feel more uncomfortable than they might feel in their normal, daily life. Yet thinking and answering questions about themselves and their relationships could make youth feel uncomfortable or sad. In similar projects in the past, however, participants have generally reported enjoying participating in the research. Resources for youth and families to seek additional support will be provided as needed.

Some questionnaire items ask about sensitive topics, such as whether or not youth have had symptoms of depression, thoughts about suicide, and self-harm or suicidal behaviors. If your child reports past or current plans / intent for suicide, the research team will notify you immediately by phone or email (the day the information is reported) and discuss options for additional supports for your child. At the end of the project, the research team will inform you if your child reported other types of distress (e.g., elevated depressive symptoms).

**Benefits**

Participants may enjoy answering questions about themselves and their friendships. Results of this study will help us understand how friendships promote resiliency in youth. The goal is to help youth have good friendships and feel good about themselves. Information learned from this project will be used to enhance existing support for students.

**Compensation**

Each participant will be paid for each portion of the study they complete. Youth will be paid $10 for the first two questionnaires, $20 for the social interaction task, $20 for the daily text surveys, and $15 for the last questionnaire.

**Confidentiality**

Information you and your child provide will be kept confidential. Neither your name nor your child’s name will be on any of the data. A code number will be used to protect your and your child’s identity, and your names and any other identifying information will not be reported in any publications or presentations of this data. The key connecting your names with your child’s code
number will be stored using software that provides additional security and will be destroyed approximately 12 months after data collection ends (data collection estimated to end by 6/30/2023). Questionnaire data collected through online survey software and the videorecordings will be protected using passwords and software that provides additional security. The data will only be accessible by trained laboratory staff at the University of Maine. Data will not be accessible by school staff and/or other students. Data will be kept indefinitely and under the secure protections described above.

The only exception to confidentiality is in the event that the information your child provides during the project indicates that they are experiencing a significant degree of distress (e.g., elevated depressive symptoms). If this were the case, we would contact you to discuss the information and offer resources to help you. If the situation were very serious (e.g., current plans for suicide), we would enlist the help of the school counselor to contact you and offer support for your child immediately.

**Voluntary**
Participation in this study is voluntary. If you give your permission but your child does not want to participate, your child does not have to participate in the study. Your child also may stop participating any time during the project, and they can skip questions on the questionnaires. If your child does not complete all parts of the study, she/he will be paid for the portion of the study that she/he did complete.

**Contact Information**
If you have any questions about this study, please contact Dr. Rebecca Schwartz-Mette at any time (rebecca.schwartzmette@maine.edu; 207-581-2048). If you have any questions about your child’s rights as a research participant, contact the Office of Research Compliance, University of Maine, 207/581-2657, umric@maine.edu.

**THIS FORM MUST BE RETURNED TO ORONO HIGH SCHOOL BY FRIDAY NOVEMBER 8th, 2019.** All students who return their form (regardless of whether they have your permission to participate or not) will be entered into a drawing to win one of several gift cards to local restaurants.

Please enter your child’s name, grade, and gender below.

First name ______________________________

Last name ______________________________

Grade_______ Gender _______________

Please enter your name below.

First name ______________________________

Last name ______________________________

Please select a response to indicate whether or not you give your child permission to participate in the BIRCH Project.
Check one:  

___ YES, I give my child permission to participate in this research.  

___ NO, I do not give my child permission to participate in this research.  

If you selected YES (you give your child permission to participate), please include your contact information below. This information will be used to contact you ONLY if your child reports that they are in significant distress.

   Phone number:  
   Email:  
   Preferred method of contact:  phone / email  

Optional:  

___ I give permission for portions of the video recording of my minor child to be shown to scientific or educational audiences. (Note: Media audiences are NOT considered scientific or educational)  

___ I do not give permission for portions of the video recording of my minor child to be shown to scientific or educational audiences.  

___ I give the research team permission to contact my family in the future regarding opportunities to be involved in other studies.  

___ I do not wish to be contacted in the future for other studies.  

University of Maine Institutional Review Board Approved for Use Through 8/20/2020
Appendix B

Adolescent Participant Assent Form (Qualtrics Survey)

Participant Assent Form
Principal Researcher: Rebecca Schwartz-Mette, PhD.

You are invited to participate in a research project being done by Dr. Rebecca Schwartz-Mette at the University of Maine. The goal is to learn how friends act with one another and how friends make one another feel better when one has a problem. You have been invited because you are in grades 6-12, and your parent or guardian has given their permission for you to participate.

What Will I Do?

You will fill out questionnaires three times during the school year (fall, winter, spring) in advisory period or guidance class. This will take 30-60 minutes. The questions ask things like:

- how you act with other people
- how you feel about yourself
- what your friendships are like
- who your friends are
- who your girlfriend or boyfriend is (if you have one)

Some questions ask about sensitive things, like whether or not you have had thoughts about suicide. If you report being very serious about hurting yourself, we would talk with your parent/guardian and school counselor about ways to help you.

You also will talk with a friend (that you choose) after school in a quiet place like a classroom in the fall. You may talk about problems you have had recently, talk about whatever you want to talk about, and/or work on a project together, like a puzzle. We will videorecord this interaction. This part will take about 30 minutes. The researchers will have you stop talking and stop recording if they are worried because you or your friend look really upset or get into a fight.

The last part involves answering short questions on your smartphone every day for a week in the spring. These questions ask about when you hang out with friends in a typical day and how you feel about hanging out. The researchers will text you a link to the questions that you will answer on your phone 5 times a day. It should take about 2 minutes each time. If you do not have a smartphone, you can borrow one from us and return it at the end of the week.

Risks
Doing this project should not make you feel any different than you feel in your normal, daily life. Most kids who have done similar projects enjoyed it. However, some kids may feel uncomfortable or sad when answering questions about themselves and their friends. If you feel sad from answering the questions, you can talk with a counselor at the school.

Benefits
You may enjoy answering questions about yourself and your friendships. This study will help us understand how friendships help youth feel better and be healthier.
Compensation
You will receive payment for each part of the study you complete. You will earn $10 for the first two surveys, $20 for interacting with your friend, $20 for the daily text surveys, and $15 for the last survey (a total of $75).

Confidentiality
Your information will be kept confidential. This means that your name will not be on your answers (you will have a code number instead) and that the answers will be kept private. Only the research team will see your answers. Your answers and recording will be protected using passwords and software that provides extra security.

If you told us you were very depressed or if you were serious about hurting yourself, we would talk with your parents and school guidance counselor to help you.

Voluntary
Participation in this study is optional. This means you do not have to participate if you don’t want to. You also can stop participating any time during the project, and you can skip questions on the questionnaires. If you do not complete all parts of the study, you will be paid for the part of the study that you did complete.

Contact Information
If you have any questions about this study, please contact Dr. Rebecca Schwartz-Mette at any time (rebecca.schwartzmette@maine.edu; 207-581-2048). If you have any questions about your rights as a research participant, contact the Office of Research Compliance, University of Maine, 207/581-1498 or 207/581-2657, umric@maine.edu.
Appendix C

Time 1, 3, and 5 Demographic Questionnaire (Qualtrics survey)

Questionnaires (Time 1, 3, and 5)

Demographic information (Harris et al., 2003)

Age: ___________   Birthdate: ___ / ___ / ___

Gender Identity: ___female ___ male_____other:________

Sexual orientation:
   Heterosexual (straight)
   Homosexual (gay/lesbian)
   Questioning
   Other: __________

For the next two questions, check all categories that apply:

1. What is your ethnicity?
   _____ Hispanic or Latino           _____ Not Hispanic or Latino

2. What is your race?
   _____ American Indian / Alaskan Native           _____ Black or African American
   _____ Asian                                      _____ White
   _____ Native Hawaiian or Other Pacific Islander
Appendix D:

*Center for Epidemiologic Studies Depression Scale (CES-D); Radloff, 1977*

**CES-D**

Below is a list of ways you might have felt or behaved. Please circle the number that indicates how often you have felt this way during the past week.

1. I was bothered by things that didn’t usually bother me.

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<th>Number</th>
<th>Rarely or none of the time (less than 1 day)</th>
<th>Some or a little of the time (1-2 days)</th>
<th>Occasionally or a moderate amount of time (3-4 days)</th>
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2. I did not feel like eating; my appetite was poor.

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3. I felt that I could not shake off the blues even with help from my family and friends.

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4. I felt I was just as good as other people.

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5. I had trouble keeping my mind on what I was doing.

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6. I felt depressed.

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7. I felt that everything I did was an effort.

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<td>(5-7 days)</td>
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<td>13. I talked less than usual.</td>
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<td>Rarely or none</td>
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<td>15. People were unfriendly.</td>
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<tr>
<td>Rarely or none</td>
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<tr>
<td>of the time</td>
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<td>(less than 1 day)</td>
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<td>Some or a little</td>
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<td>of the time</td>
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<td>Occasionally or a</td>
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<td>moderate amount of time</td>
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<td>of the time</td>
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<td>(3-4 days)</td>
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<td>Most or all</td>
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<tr>
<td>of the time</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
(less than 1 day) | (1-2 days) | (3-4 days) | (5-7 days)
---|---|---|---

16. I enjoyed life.
   - Rarely or none of the time
     - (less than 1 day)
     - (1-2 days)
     - (3-4 days)
     - (5-7 days)
   - Some or a little of the time
     - (less than 1 day)
     - (1-2 days)
     - (3-4 days)
     - (5-7 days)
   - Occasionally or a moderate amount of time
     - (less than 1 day)
     - (1-2 days)
     - (3-4 days)
     - (5-7 days)
   - Most or all of the time
     - (less than 1 day)
     - (1-2 days)
     - (3-4 days)
     - (5-7 days)

17. I had crying spells.
   - Rarely or none of the time
     - (less than 1 day)
     - (1-2 days)
     - (3-4 days)
     - (5-7 days)
   - Some or a little of the time
     - (less than 1 day)
     - (1-2 days)
     - (3-4 days)
     - (5-7 days)
   - Occasionally or a moderate amount of time
     - (less than 1 day)
     - (1-2 days)
     - (3-4 days)
     - (5-7 days)
   - Most or all of the time
     - (less than 1 day)
     - (1-2 days)
     - (3-4 days)
     - (5-7 days)

18. I felt sad.
   - Rarely or none of the time
     - (less than 1 day)
     - (1-2 days)
     - (3-4 days)
     - (5-7 days)
   - Some or a little of the time
     - (less than 1 day)
     - (1-2 days)
     - (3-4 days)
     - (5-7 days)
   - Occasionally or a moderate amount of time
     - (less than 1 day)
     - (1-2 days)
     - (3-4 days)
     - (5-7 days)
   - Most or all of the time
     - (less than 1 day)
     - (1-2 days)
     - (3-4 days)
     - (5-7 days)

19. I felt that people dislike me.
   - Rarely or none of the time
     - (less than 1 day)
     - (1-2 days)
     - (3-4 days)
     - (5-7 days)
   - Some or a little of the time
     - (less than 1 day)
     - (1-2 days)
     - (3-4 days)
     - (5-7 days)
   - Occasionally or a moderate amount of time
     - (less than 1 day)
     - (1-2 days)
     - (3-4 days)
     - (5-7 days)
   - Most or all of the time
     - (less than 1 day)
     - (1-2 days)
     - (3-4 days)
     - (5-7 days)

20. I could not get “going.”
   - Rarely or none of the time
     - (less than 1 day)
     - (1-2 days)
     - (3-4 days)
     - (5-7 days)
   - Some or a little of the time
     - (less than 1 day)
     - (1-2 days)
     - (3-4 days)
     - (5-7 days)
   - Occasionally or a moderate amount of time
     - (less than 1 day)
     - (1-2 days)
     - (3-4 days)
     - (5-7 days)
Appendix E

Co-Rumination Questionnaire (Qualtrics Survey); Rose, 2002

Co-Rumination questionnaire

Think about the way you usually are with your friends.

1. We spend most of our time together talking about problems that my friend or I have.
   1  2  3  4  5
   Not At All True A Little True Somewhat True Mostly True Really True

2. If one of us has a problem, we will talk about the problem rather than talking about something else or doing something else.
   1  2  3  4  5
   Not At All True A Little True Somewhat True Mostly True Really True

3. After my friend tells me about a problem, I always try to get my friend to talk more about it later.
   1  2  3  4  5
   Not At All True A Little True Somewhat True Mostly True Really True

4. When I have a problem, my friend always tries really hard to keep me talking about it.
   1  2  3  4  5
   Not At All True A Little True Somewhat True Mostly True Really True

5. When one of us has a problem, we talk to each other about it for a long time.
   1  2  3  4  5
   Not At All True A Little True Somewhat True Mostly True Really True

6. When we see each other, if one of us has a problem, we will talk about the problem even if we had planned to do something else together.
   1  2  3  4  5
   Not At All True A Little True Somewhat True Mostly True Really True

7. When my friend has a problem, I always try to get my friend to tell me every detail about what happened.
   1  2  3  4  5
   Not At All True A Little True Somewhat True Mostly True Really True

8. After I’ve told my friend about a problem, my friend always tries to get me to talk more about it later.
   1  2  3  4  5
   Not At All True A Little True Somewhat True Mostly True Really True

9. We talk about problems that my friend or I are having almost every time we see each other.
   1  2  3  4  5
   Not At All True A Little True Somewhat True Mostly True Really True
10. If one of us has a problem, we will spend our time together talking about it, no matter what else we could do instead.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not At All True</td>
<td>A Little True</td>
<td>Somewhat True</td>
<td>Mostly True</td>
<td>Really True</td>
</tr>
</tbody>
</table>

11. When my friend has a problem, I always try really hard to keep my friend talking about it.

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<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not At All True</td>
<td>A Little True</td>
<td>Somewhat True</td>
<td>Mostly True</td>
<td>Really True</td>
</tr>
</tbody>
</table>

12. When I have a problem, my friend always tries to get me to tell every detail about what happened.

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<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not At All True</td>
<td>A Little True</td>
<td>Somewhat True</td>
<td>Mostly True</td>
<td>Really True</td>
</tr>
</tbody>
</table>

When we talk about a problem that one of us has . . .

1. . . . we will keep talking even after we both know all of the details about what happened.

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<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not At All True</td>
<td>A Little True</td>
<td>Somewhat True</td>
<td>Mostly True</td>
<td>Really True</td>
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</tbody>
</table>

2. . . . we talk for a long time trying to figure out all of the different reasons why the problem might have happened.

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<th>3</th>
<th>4</th>
<th>5</th>
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<tbody>
<tr>
<td>Not At All True</td>
<td>A Little True</td>
<td>Somewhat True</td>
<td>Mostly True</td>
<td>Really True</td>
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</tbody>
</table>

3. . . . we try to figure out every one of the bad things that might happen because of the problem.

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<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not At All True</td>
<td>A Little True</td>
<td>Somewhat True</td>
<td>Mostly True</td>
<td>Really True</td>
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</tbody>
</table>

4. . . . we spend a lot of time trying to figure out parts of the problem that we can’t understand.

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<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not At All True</td>
<td>A Little True</td>
<td>Somewhat True</td>
<td>Mostly True</td>
<td>Really True</td>
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</tbody>
</table>

5. . . . we talk a lot about how bad the person with the problem feels.

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<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not At All True</td>
<td>A Little True</td>
<td>Somewhat True</td>
<td>Mostly True</td>
<td>Really True</td>
</tr>
</tbody>
</table>

6. . . . we’ll talk about every part of the problem over and over.

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<th>4</th>
<th>5</th>
</tr>
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<tbody>
<tr>
<td>Not At All True</td>
<td>A Little True</td>
<td>Somewhat True</td>
<td>Mostly True</td>
<td>Really True</td>
</tr>
</tbody>
</table>

7. . . . we talk a lot about the problem in order to understand why it happened.

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<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not At All True</td>
<td>A Little True</td>
<td>Somewhat True</td>
<td>Mostly True</td>
<td>Really True</td>
</tr>
</tbody>
</table>

8. . . . we talk a lot about all of the different bad things that might happen because of problem.

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<th>4</th>
<th>5</th>
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<tbody>
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<td>Not At All True</td>
<td>A Little True</td>
<td>Somewhat True</td>
<td>Mostly True</td>
<td>Really True</td>
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<td>Not At All True</td>
<td>A Little True</td>
<td>Somewhat True</td>
<td>Mostly True</td>
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<tr>
<td>9.</td>
<td>we talk a lot about parts of the problem that don’t make sense to us.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>10.</td>
<td>we talk for a long time about how upset it has made the one of us with the problem.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>11.</td>
<td>we usually talk about that problem every day even if nothing new has happened.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>12.</td>
<td>we talk about all of the reasons why the problem might have happened.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>13.</td>
<td>we spend a lot of time talking about what bad things are going to happen because of the problem.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>14.</td>
<td>we try to figure out everything about the problem, even if there are parts that we may never understand.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>15.</td>
<td>we spend a long time talking about how sad or mad the person with the problem feels.</td>
<td>1</td>
<td>2</td>
<td>3</td>
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Appendix F:

Best Friendship Quality

The Network of Relationships Social Provision Version: Best Friendship; Furman & Buhrmester, 1985

Everyone has a number of people who are important in his or her life. These questions ask about your relationship with your best friend.

How long have you been best friends with this person? ____ years ____ months

What is your best friend’s gender?

Male  Female  Other

What is your best friend’s age? ____

Now we would like you to answer the following questions about your best friend:

<table>
<thead>
<tr>
<th>How much free time do you spend with this person?</th>
<th>Little or None</th>
<th>Somewhat</th>
<th>Very Much</th>
<th>Extremely Much</th>
<th>The Most</th>
</tr>
</thead>
<tbody>
<tr>
<td>How much do you and this person get upset with or mad at each other?</td>
<td>Little or None</td>
<td>Somewhat</td>
<td>Very Much</td>
<td>Extremely Much</td>
<td>The Most</td>
</tr>
<tr>
<td>How much does this person teach you how to do things that you don’t know?</td>
<td>Little or None</td>
<td>Somewhat</td>
<td>Very Much</td>
<td>Extremely Much</td>
<td>The Most</td>
</tr>
<tr>
<td>How much do you and this person get on each other’s nerves?</td>
<td>Little or None</td>
<td>Somewhat</td>
<td>Very Much</td>
<td>Extremely Much</td>
<td>The Most</td>
</tr>
<tr>
<td>How much do you talk about everything with this person?</td>
<td>Little or None</td>
<td>Somewhat</td>
<td>Very Much</td>
<td>Extremely Much</td>
<td>The Most</td>
</tr>
<tr>
<td>How much do you help this person with things she/he can’t do by her/himself?</td>
<td>Little or None</td>
<td>Somewhat</td>
<td>Very Much</td>
<td>Extremely Much</td>
<td>The Most</td>
</tr>
<tr>
<td>How much does this person like or love you?</td>
<td>Little or None</td>
<td>Somewhat</td>
<td>Very Much</td>
<td>Extremely Much</td>
<td>The Most</td>
</tr>
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</tr>
<tr>
<td>How much does this person treat you like you’re admired and respected?</td>
<td>Little or None</td>
<td>Somewhat</td>
<td>Very Much</td>
<td>Extremely Much</td>
<td>The Most</td>
</tr>
<tr>
<td>Who tells the other person what to do more often, you or this person?</td>
<td>S/he always does</td>
<td>S/he often does</td>
<td>About the same</td>
<td>I often do</td>
<td>I always do</td>
</tr>
<tr>
<td>How sure are you that this relationship will last no matter what?</td>
<td>Little or None</td>
<td>Somewhat</td>
<td>Very Much</td>
<td>Extremely Much</td>
<td>The Most</td>
</tr>
<tr>
<td>How much do you play around and have fun with this person?</td>
<td>Little or None</td>
<td>Somewhat</td>
<td>Very Much</td>
<td>Extremely Much</td>
<td>The Most</td>
</tr>
<tr>
<td>How much do you and this person disagree and quarrel?</td>
<td>Little or None</td>
<td>Somewhat</td>
<td>Very Much</td>
<td>Extremely Much</td>
<td>The Most</td>
</tr>
<tr>
<td>How much does this person help you figure out or fix things?</td>
<td>Little or None</td>
<td>Somewhat</td>
<td>Very Much</td>
<td>Extremely Much</td>
<td>The Most</td>
</tr>
<tr>
<td>How much do you and this person get annoyed with each other’s behavior?</td>
<td>Little or None</td>
<td>Somewhat</td>
<td>Very Much</td>
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Appendix G:

Romantic Relationship Quality

(Furman & Buhrmester, 1985)

Everyone has a number of people who are important in his or her life. These questions ask about your relationship with your **romantic partner**.

Are you in an exclusive romantic experience lasting longer than 3 months?

_ Yes  _ No (IF “NO”, skip to end of block)

How long is the relationship? ____ years ____ months

What is your **romantic partner’s** gender?
Male    Female    Other

What is your **romantic partner’s** age? ___

How would you describe your **sexual orientation**? ____________________________

How would you describe your **romantic partner’s** sexual orientation? __________________

Now we would like you to answer the following questions about your **romantic partner**:

<table>
<thead>
<tr>
<th>How much free time do you spend with this person?</th>
<th>Little or None</th>
<th>Somewhat</th>
<th>Very Much</th>
<th>Extremely Much</th>
<th>The Most</th>
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<tr>
<td>How much do you and this person get upset with or mad at each other?</td>
<td>Little or None</td>
<td>Somewhat</td>
<td>Very Much</td>
<td>Extremely Much</td>
<td>The Most</td>
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<td>How much does this person teach you how to do things that you don’t know?</td>
<td>Little or None</td>
<td>Somewhat</td>
<td>Very Much</td>
<td>Extremely Much</td>
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<tr>
<td>How much do you and this person get on each other’s nerves?</td>
<td>Little or None</td>
<td>Somewhat</td>
<td>Very Much</td>
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<td>Question</td>
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<td>How much do you talk about everything with this person?</td>
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<td>How much do you help this person with things she/he can't do by her/himself?</td>
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<td>How much does this person like or love you?</td>
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<td>How much does this person treat you like you’re admired and respected?</td>
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<td>Who tells the other person what to do more often, you or this person?</td>
<td>S/he always does</td>
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<td>I often do</td>
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<td>How much do you play around and have fun with this person?</td>
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<td>How much do you and this person disagree and quarrel?</td>
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<td>How much does this person help you figure out or fix things?</td>
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<td>How much do you and this person get annoyed with each other’s behavior?</td>
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Appendix H:

Sociometric nominations

Note: Participants will be provided with a list of grademates participating in the study from which they will be asked to select up to 10 close friends (same-gender or cross-gender). The names of the participating grademates will be preloaded into the online questionnaires so that youth can easily select the names of their friends from the preloaded list.

Following the list of participating grademates, participants will see the following items, which they will also respond to:

Who is your very best friend?  
_________________________________  (Very Best Friend: First Name, Last Name)

How long have you been friends with them?  
  __Years  
  __Months

Does your very best friend go to your school?  
  __Yes  
  __No  

(If no:) How do you know this friend?  _________________________________

Do you have a girlfriend or boyfriend (romantic partner)?  
  __Yes  
  __No  

(If yes:) How long have you been in a relationship with them?  
  __Years  
  __Months

What is your romantic partner’s name?  
_________________________________  (Romantic Partner: First Name, Last Name)

Does your romantic partner go to your school?  
  __Yes  
  __No  

(If no:) How do you know them?  _________________________________
Appendix I:

*Problem Generation and Salience Questionnaire (Rose, 2004)*

List a problem that you have and answer the following questions about the problem.

PROBLEM: ________________________________________________________________

1. How upsetting is this problem?

   1  2  3  4  5

   Not At All                              Very Upsetting

2. How important is this problem?

   1  2  3  4  5

   Not At All                              Very Upsetting

3. How hard would it be to solve this problem?

   1  2  3  4  5

   Not At All                              Very Upsetting

4. How hard would it be to feel better about this problem?

   1  2  3  4  5

   Not At All                              Very Upsetting

5. How much do you want to feel better about this problem?

   1  2  3  4  5

   Not At All                              Very Upsetting

6. How much do you want this problem not to bother you?

   1  2  3  4  5

   Not At All                              Very Upsetting

7. How much do you want to not be upset about this problem?

   1  2  3  4  5

   Not At All                              Very Upsetting
Appendix J:

*Problem talk task script*

Youth are brought to the observational room.

Experimenter: “This part of the study involves talking about problems. Remember how you each came up with a problem? These are the problems you will talk about now. You should talk about each friend’s problem, but it doesn’t matter whose problem you talk about first. You can talk about anything you want to about the problems. You can talk about the problems as long as you want to for up to 15 minutes when I will come back. If you are done talking about the problems before I come back, you can talk about something else if you want to. Do you have any questions?”
Appendix K:

Scripts for Addressing Elevated Risk Situations

Importantly, only the PI and trained graduate research assistants (who have and will continue to gain supervised clinical experience as part of a PhD program in clinical psychology) will address any issues related to participant risk. No undergraduate research assistants who may later join the project team will acquire, interpret, or respond to risk information from participants.

The PI is a licensed clinical psychologist and will be present at each school-based survey data collection session. As soon as each participant submits their surveys via Qualtrics, Qualtrics is preprogrammed to immediately score participants responses to the measures of depressive symptoms, non-suicidal self-injury, and suicidality. An email is then immediately sent to the PI from Qualtrics detailing information submitted by any participant whose responses exceed the PI’s predetermined risk cutoffs listed below. This immediate communication of risk information precludes human error involved in hand-scoring questionnaires quickly following each data collection session so that any risk information that needs to be immediately addressed can be communicated appropriately.

**Depressive Symptoms**

The measure of depressive symptoms used in this study is not diagnostic in nature. Rather, a clinical cutoff (sum score of 19; possible range of scores 0-60) has been established to identify youth whose depressive symptoms exceed age-based norms and may indicate elevated risk for developing a depressive disorder. This measure will be administered at Time 1, 3, and 5. Because the measure cannot ethically be used to diagnose depressive disorders and because depressive symptoms in adolescence fluctuate with time, the research team will notify parents of participants whose CESD scores are 19 or above after the Time 5 assessment.

**Non-Suicidal Self-Injury (NSSI)**

The measure of NSSI asks about the frequency of NSSI behaviors in the last year (Time 1) or since the last assessment (Time 3, 5). Because the behavior being assessed is, by definition, non-suicidal in nature and results in wounds that do not require medical attention (e.g., bruises from hitting self, hair loss from hair pulling, superficial lacerations from cutting) the research team will notify parents of participants who report self-injuring frequently after the Time 5 assessment (1-2x a month or more since the Time 3 assessment).

**Suicidality (past suicidal ideation, plan, intent, or attempt; current suicidal ideation, plan, intent)**

At each time the questionnaire is administered (Time 1, 3, 5), the parent of any participant who endorses past suicidal plans, intent, or attempts and/or current suicidal plans or intent will be notified. Participants who report only past suicidal ideation or only current suicidal ideation will be notified following the Time 5 assessment. Suicidal ideation is more common and less predictive of death by suicide than are suicide attempts, plans, and intent. The decision about when to inform parents of risk information reflects a delicate balance of wanting to observe the phenomena of interest (e.g., suicidal ideation) without disrupting contagion processes as a result of intervention with needing to intervene when levels of suicidality are more concerning (e.g., attempts, plans, intent).

Parents of students who are identified as being at risk at the end of the Time 5 assessment with regard to depressive symptoms, self-injury, and/or past/current suicidal ideation will be contacted by phone or email within one week of the data collection session and provided with a resource list (e-mail or hard copy).
Parents of students who are identified at the end of the Time 1, 3, or 5 assessment with regard to past suicide plan/attempt/intent or current suicide plan/intent will be notified the same day. Specifically, at the end of each data collection session, the PI will review all risk emails and work with the school guidance counselor (on-site) to contact any student who reports a past suicide plan/attempt/intent or current suicide plan/intent before they leave for the end of the school day. The PI will then meet with the student at the school to conduct an in-depth, in-person suicide risk assessment and to discuss next steps involving contacting the student’s parents. Students also will be provided with a hard copy of a resource list including hotlines and referrals for counseling. Parents of these students will be contacted by phone the day of data collection with information about their student’s suicide risk information and will also be provided with the resource list via email (or hard copy mailed to them or available for pickup if they prefer). In the unlikely event that a student’s suicide risk is imminent/immediate, the PI will work with parents (or with school personnel if parents are unavailable) to arrange emergency transport to a local hospital.

Note: In the event that a participant communicates risk information that exceeds predetermined cutoffs directly to a graduate research assistant, the graduate research assistant will immediately inform the PI, who will follow the steps outlined above. If a graduate research assistant is standing in for the PI for any reason during any part of a data collection session (e.g., PI having meeting with school guidance counselor about an at-risk student during another data collection session), the graduate assistant will inform the PI as soon as possible about any risk information that is conveyed, and the PI will follow the steps outlined above. Tasks will be delegated from the PI to graduate assistants only in instances in which the PI is immediately unavailable.

Script Outlines
If the participant’s depression sum score $\geq 19$ following the Time 5 assessment, the research team will contact the participants’ parent via email or phone with the following information:

- Child’s responses to the measure of depressive symptoms indicate that she/he has been experiencing an elevated level of symptoms in the past week.
- Community resources are available to provide support for the child (the appropriate Community Resources sheet will be sent via email or post to the parent/guardian)
- Dr. Schwartz-Mette is available to talk further if parents/guardians have any questions.

If participants report self-injuring 1-2x a month or more at the Time 5 assessment, the research team will contact the participants’ parent via email or phone with the following information:

- Child’s responses to the measure of non-suicidal self-injury indicate that she/he has been self-injuring herself/himself 1-2x a month or more.
- Community resources are available to provide support for the child (the appropriate Community Resources sheet will be sent via email or post to the parent/guardian)
- Dr. Schwartz-Mette is available to talk further if parents/guardians have any questions.

The research team will follow up IMMEDIATELY (same day) for current suicide plan/intent or for past attempt/plan/intent following the Time 1, 3, or 5 assessment if:  

Participants’ response to SBQ item 1 is 3a, 3b, 4a, or 4b:

Item 1: “Have you ever thought about or attempted to kill yourself?”

3a: “I have had a plan at least once to kill myself but did not try to do it.”
3b: “I have had a plan at least once to kill myself and really wanted to die.”
4a: “I have attempted to kill myself, but did not want to die.”
4b: “I have attempted to kill myself, and really hoped to die.”

OR

Participants’ response to SBQ item 3 is 2b or 3b:
Item 3: Have you ever told someone that you were going to commit suicide, or that you might do it?
2b: Yes, at one time, and really wanted to die
3b: Yes, more than once, and really wanted to do it

OR

Participants’ response to SBQ item 4 is 4, 5, or 6:
Item 4: How likely is it that you will attempt suicide someday?
4: Likely
5: Rather likely
6: Very likely

OR

Any information about past attempt/plan/intent or current plan/intent is communicated via any other means (e.g., in person to a member of the research team).

In any of these events, Dr. Schwartz-Mette (or trained graduate research assistant if Dr. Schwartz-Mette is unavailable) will work with school staff to locate the student before the end of the school day for a private meeting (e.g., in guidance office) to communicate the following information:

“I wanted to check in with you about some of your answers to the questionnaire about suicide. In particular, you indicated that you (choose any of the following that are relevant: had a plan to kill yourself, attempted to kill yourself, told someone you were going to commit suicide and really wanted to do it). I have a few more questions to follow up on your answer(s).”

1) “Are you having current thoughts of death, dying, or suicide?” (i.e., current suicidal ideation)
2) “Do you have a current suicide plan?” (i.e., current suicide plan)
3) “Do you feel as if you currently want to do something to harm or kill yourself?” (i.e., current suicidal intent)

If they have ONLY had past attempt/plan/intent and NO current plan/intent:
“Thank you for letting me know. In the permission form that your parents signed and in the assent form that you read, we talked about how if your answers to the questionnaires indicated some level of concern, that we would talk with your parents to let them know. I wanted to tell you that we will get in touch with your parents today to let them know. We’ll also be available to help you locate resources to help you or answer any questions you have. For now, we would like to give you a list of community resources in case you would like to seek additional support.”
(Experimenter gives participant Community Resource List; parents contacted to relay risk information via phone within 24 hours and another copy of Resources arranged to be sent to parents via email or hard copy)
Information to be communicated to parents via phone includes:

- Child’s responses to the measure of suicidality indicate [insert appropriate information here].
- An in-person conversation suggested that [relay appropriate information here about current suicide risk].
- Community resources are available to provide support for the child (child was provided with hard copy of Community Resources sheet; the appropriate Community Resources sheet will be sent via email or post to the parent/guardian)
- Dr. Schwartz-Mette is available to talk further if parents/guardians have any questions.

**IF CURRENT PLAN/INTENT:**

- Dr. Schwartz-Mette (or other professional) assesses further for imminent suicide risk (e.g., access to means, reasons for living, etc.)
- If risk for suicide is imminent and hospitalization appears necessary, Dr. Schwartz-Mette will work with school staff to supervise student while parents are contacted immediately/while child is still at school
- Dr. Schwartz-Mette will facilitate transport of student to emergency services (e.g., ER) via parents or will involve school staff to facilitate transport if parents unavailable

The research team will follow up for past/current suicidal ideation (including communication of suicidality to others without intent) within one week following the Time 5 assessment if:

- Participants’ response to item 2 is 3, 4, or 5:
  
  **Item 2:** “How often have you thought about killing yourself in the past year?”
  
  3: Sometimes (2 times)
  4: Often (3-4 times)
  5: Very Often (5 or more times)

- OR

- Participants’ response to item 3 is 2a or 3a:
  
  **Item 3:** Have you ever told someone that you were going to commit suicide, or that you might do it?
  
  2a: Yes, at one time, but did not really want to die
  3a: Yes, more than once, but did not want to do it

- OR

- Any information about past/current ideation is communicated via any other means (e.g., in person to a member of the research team).

The research team will contact the participants’ parent via email or phone with the following information:

- Child’s responses to the measure of suicidality indicate that she/he has experienced [insert relevant information here].
- Community resources are available to provide support for the child (the appropriate Community Resources sheet will be sent via email or post to the parent/guardian)
- Dr. Schwartz-Mette is available to talk further if parents/guardians have any questions.
Note: The whole collection of responses involving any exceeding of risk thresholds will be reviewed and, in cases where the information does not explicitly meet the threshold for same-day parent communication but the information is highly concerning (e.g., participant skipped the suicide plan/attempt item but reported high levels of depression and that they are “very likely” to attempt suicide one day), the PI may elect to contact parents the same day with information about the child’s responses.
Appendix L:

**Dyadic co-rumination coding descriptions**

**Co-Rumination (5 aspects)**

Co-rumination is defined as talking extensively about problems with a relationship partner and is characterized by a large amount of time spent talking about problems, mutual encouragement of problem talk, rehashing problems, speculating about problems, and dwelling on negative affect.

**Ways dyads may co-ruminate / Examples:**

a) **time spent talking about problems:** the dyad spends a large amount of time talking about problems (e.g., friends spend ¾ of the problem talk segment discussing problems)

b) **mutual encouragement of problem talk:** the dyad keeps the problem talk going
   Alice: We have been talking about this forever! Oh well, it’s okay.
   Jane: I know; it’s important. So what happened with [the problem] yesterday?

c) **rehashing problems:** the dyad talks about problems or parts of the problems over and over
   Daniel: I mean I know I’ve said this already, but she freaking stole his wallet!!
   Josh: Right, dude. She freaking stole it. And remember how she said she didn’t do it?

d) **speculating about problems:** the dyad discusses reasons why the problem exists, what may happen next, etc.
   Jennifer: Why do you think he did that? He can’t be that mean.
   Sarah: I don’t know. I mean, maybe he was having a bad day?

e) **dwelling on negative affect:** the dyad focuses on the experience of negative emotions like feeling sad, anxious, angry, or depressed
   Bill: It sucks man. It really sucks.
   Henry: Seriously. You must feel like crap.

**Additional Notes:**

Similar to other interpersonal processes (e.g., conflict or support), co-rumination is best conceptualized as occurring along a continuum. That is, conversations cannot simply be labeled as “co-rumination” or “not co-rumination.” Instead conversations vary in the degree to which they involve co-rumination. Some conversations involving problems may not involve co-rumination. For example, a youth may tell a friend that he is free on Friday night because his girlfriend broke up with him, and then the friends begin to make plans for Friday without discussing the break up further. On the other end of the continuum, a youth might tell her friend that she is free on Friday because her boyfriend broke up with her, and, in this case, the friend prompts the youth with questions, the girls rehash details of the break up, speculate about the causes and social repercussions of the break up, and talk a lot about how bad the youth feels. Furthermore, it is possible for a conversation to involve some co-rumination but not as much as the extreme example. For instance, the conversation might involve some aspects of co-rumination (e.g., speculating) but not others (e.g., dwelling on negative feelings) or involve all aspects of co-rumination at a lower intensity than in the extreme example. A moderate score for particular aspects of co-rumination may be obtained in one of two ways. For example, one youth
may exhibit a large amount (e.g., a “4” or “5”) of one aspect while the other youth exhibits a small amount (a “1” or “2”). In this case a moderate score of “3” may be given for the dyad on that particular aspect. Alternatively, both youth may exhibit moderate amounts of a particular aspect. In this case, the dyad may also score a “3” for that particular aspect.

Rating Scale:

Four aspects of co-rumination (i.e., encouraging, rehashing, speculating and focusing on negative affect) will be scored on a 1-5 scale where each number represents the amount of each aspect the dyad exhibits (time spent discussing problems will be numerical, in minutes and seconds):

1: Not at all or very little
2: A little of the time
3: Some of the time
4: A lot of the time
5: All the time / Very
Appendix M:

Observational Coding Sheet

Date________
Dyad________ Coder______________________________  
Friend A’s Problem______________________________________________ Discussed? Y/N
  Other problem 1______________________________________________ Discussed? Y/N
  Other problem 2______________________________________________ Discussed? Y/N
  Other problem 3______________________________________________ Discussed? Y/N
Friend B’s Problem______________________________________________ Discussed? Y/N
  Other problem 1______________________________________________ Discussed? Y/N
  Other problem 2______________________________________________ Discussed? Y/N
  Other problem 3______________________________________________ Discussed? Y/N

Purpose: ____ practice coding ____reliability coding ____ regular coding

How characteristic of this dyad are the following? (see coding manual for descriptions of codes)

**Aspects of Co-Rumination**

<table>
<thead>
<tr>
<th>Aspect</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rehashing</td>
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<tr>
<td>Speculating</td>
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<tr>
<td>Dwelling on</td>
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<tr>
<td>Negative Affect</td>
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<tr>
<td>Encouraging</td>
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<td></td>
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</tr>
<tr>
<td>Problem Talk</td>
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</tr>
</tbody>
</table>

Problem Talk Time (TOTAL minutes: seconds, e.g., XX:XX)  
______________________________________________

Did Friend A discuss a romantic experience problem? Y/N
  If yes, what was it:___________________

Did Friend B discuss a romantic experience problem? Y/N
  If yes, what was it:___________________

Notes, Questions, or Problems:
BIOGRAPHY OF THE AUTHOR

Jessica L. Shankman was born and raised in St. Charles, Illinois and graduated from St. Charles North High School in 2011. She earned her Bachelor of Arts in Child Psychology from the University of Minnesota and graduated summa cum laude. Jessica entered the child-track of the clinical psychology doctoral program at the University of Maine in 2016 and earned her Master’s degree in Clinical Psychology in 2018. She is completing her pre-doctoral internship at Lucile Packard Children’s Hospital at Stanford and Children’s Health Council consortium training program in Palo Alto, CA (2021-2022). Jessica’s program of research aims to understand the impact of adolescent romantic experiences on depressive symptom development, with emphasis in examining how friendship processes may buffer and/or exacerbate this association. More broadly, she is interested in better understanding ways to increase access and bolster evidence-based treatments for adolescent-onset depression targeting interpersonal skills. She will complete a post-doctoral fellowship at the Children’s Hospital of Colorado in integrated primary care and gender health (2022-2023). Jessica is a candidate for the Doctor of Philosophy degree in Psychology from the University of Maine in August 2022.