

**PARENT, PEER, AND SIBLING
RELATIONSHIP FACTORS AND DEPRESSION IN
ADOLESCENCE AND EMERGING ADULTHOOD:
A GROWTH CURVE ANALYSIS**

by

Laura J. Finan

A dissertation submitted to the Faculty of the University of Delaware in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Human Development and Family Studies

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ABSTRACT

The purpose of the current study was to explore how gender and social relationship factors might influence trajectories of depressive symptoms from adolescence to emerging adulthood. Specifically, adolescent-parent communication with mothers and fathers, peer support, and sibling warmth and hostility were examined for girls and boys. Adolescents ($N = 372$; $Age = 16.09$; $SD = .69$; 55% female) from the Mid-Atlantic United States completed surveys in the spring of 2007, 2008, and 2009 and were followed-up again in the fall of 2014 when they were emerging adults. Growth curve modeling results suggested that alone, gender did not predict differences in depressive symptom trajectories. However, gender interacted with several social relationship factors to predict levels of depressive symptoms at age 16 and changes in depressive symptoms across developmental periods. Communication with mothers and fathers and peer support negatively predicted intercepts for girls, whereas peer support negatively and sibling hostility positively predicted intercepts for boys. Further, adolescent-mother communication for girls and adolescent-father communication for boys predicted the downward curvature or decline in depressive symptoms into emerging adulthood. Sibling warmth and hostility for girls' and only sibling hostility for boys predicted less steep declines in depressive symptoms over time. Findings draw attention to the gendered experiences with depressive symptoms and the importance of social relationship factors in the lives of adolescents and emerging adults. Implications for intervention and prevention are discussed.

Chapter 1

INTRODUCTION

Depression is one of the most commonly diagnosed mental disorders in the United States (U.S.). In 2013, the Substance Abuse and Mental Health Services Administration [SAMHSA] conducted a national survey to examine health and substance use among noninstitutionalized U.S. citizens age 12 and older (2014). Results suggested that approximately 6.7% of adults 18 or older had at least one major depressive episode (MDE) in the last year. These rates were highest among young adults, with 8.7% of 18 to 25 year olds experiencing a MDE. Estimates are even higher for adolescents aged 12 to 17, with 10.7% of the adolescent population experiencing a MDE in the last year. Perhaps more alarmingly, adolescents' experiences of MDEs were noted to be on the rise compared to past cohorts. Further, across adolescents and adults, MDEs are more common among females, compared to their male counterparts. Specifically, 3% more women experienced a MDE compared to adult men and 10.9% more adolescent girls experienced a MDE compared to adolescent boys. Other large scale examinations have echoed these findings (Merikangas et al., 2010). These startling statistics draw attention to the prevalence of this disorder among young people and the need for continued research on this important topic.

Given the high prevalence rates, adolescence and emerging adulthood are particularly timely developmental stages for the examination of depressive symptomology. Adolescence and emerging adulthood can be characterized as periods

of great change. In adolescence, youth experience a variety of emotional and psychological changes and develop new capabilities and skills (Arnett, 2016a; 2016b). They also undergo substantial physical changes as they begin puberty. Concurrent with these developmental changes, adolescents are engaging in new social relationships and settings at unprecedented rates and are experiencing fluctuations within existing relationships (Smetana, Campione-Barr, & Metzger, 2006; Steinberg & Morris, 2001). These changes continue into emerging adulthood as individuals explore romantic relationships, experience new levels independence and freedom within families and society, and search for career options (Arnett, 2000). Given these vast developmental and social changes, the potential vulnerability of these populations to the development of adjustment disorders, such as depression, is evident.

Understanding associations between social relationship factors and changes in depression over time is a particularly relevant topic of inquiry as research suggests that experiences with depression have been linked with a myriad of both concurrent and later developmental and adjustment outcomes. For example, depression has been linked to outcomes including substance use (Cairns, Yap, Pilkington, & Jorm, 2014), maladaptive coping to stress (Herres & Ohannessian, 2015), and even suicide (Reed, Nugent, & Cooper, 2015). Broadly, multiple literature reviews have a) highlighted the effects of depression on individuals and families, b) have demonstrated the longitudinal impact of depression across developmental periods, and c) have provided considerations for practitioners or clinicians who aim to support youth experiencing depressive symptoms (e.g., Bertha & Balázs, 2013; Gladstone & Beardslee, 2009; Parker & Roy, 2001; Thapar, Collishaw, Pine, & Thapar, 2012; Wesselhoeft, Sørensen, Heiervang, & Bilenberg, 2013).

However, despite the expansive number of studies exploring depression, there are several important gaps within the literature pertaining to the effects of social relationship factors and individuals' experiences with depression over time and across developmental periods. Therefore, the present study aimed to extend the literature in two ways. First, this study seeks to identify the trajectory of depressive symptoms from adolescence to emerging adulthood. Second, adolescent gender and social relationship factors with parents, peers, and siblings were explored as predictors of depressive symptom trajectories.

Chapter 2

LITERATURE REVIEW

Theoretical Perspectives

Bioecological systems theory

Bioecological systems theory was used as one of the theoretical frameworks to guide the current study (Bronfenbrenner, 1979; Bronfenbrenner & Morris, 2006). This systems theory attempts to understand and organize the complex interactions between individuals and the environments which influence various aspects of development. In this theory, Bronfenbrenner sought to identify how an individual's characteristics, the individual's immediate settings and relationships, and various extended contexts interact with one another to influence development over time. Bronfenbrenner conceptualized the various forces of influence on individuals as the following nested structures or levels: microsystem, mesosystem, exosystem, macrosystem, and chronosystem.

In the context of understanding the associations between parent, peer, and sibling relationship factors and depression, the microsystem, mesosystem, macrosystem, and chronosystem levels are particularly useful. The microsystem is the lowest level system, and refers to the immediate contexts in which individuals are readily engaged (Bronfenbrenner, 1979). For adolescents, these contexts may include one's family, classroom, school, or peer group. Microsystems are thought to have the most immediate and direct impact on an individual's development. This construct is in line with research which demonstrates that parents, peers, and siblings are strong sources of influence on adolescents' lives (e.g., Smetana et al., 2006; Steinberg & Morris, 2001). Importantly, bioecological systems theory suggests that an individual's

microsystems interact and influence one another. The interactions among microsystems occur at the mesosystem level. For example, an adolescent's mesosystem may include their interacting relationships with their father or mother at home, as well as with their relationships with their siblings or peers at school.

The macrosystem can be thought of as the cultural environment in which an individual lives. These large scale social and cultural forces influence both the lower level systems and the individual. For example, research suggested that the adolescent-parent relationships may be impacted by cultural ideals about parenting practices and expectations for adolescent behavior (Pyke, 2000). Lastly, the chronosystem is a useful lens to understand and explore social relationships and depression. The chronosystem captures an individual's experience with environmental events and transitions that occur throughout the lifespan (Bronfenbrenner & Morris, 2006). Simply put, the chronosystem draws attention to the element of time in an individual's life. Given that adolescence and emerging adulthood are periods of great transition (Arnett, 2016a; Smetana et al., 2006), exploring how depression changes both within and across developmental periods over time is particularly relevant.

Importantly, this theory stresses the importance of the individual at the center of bioecological model (Bronfenbrenner & Morris, 2006). Bioecological systems theory proposes that individuals' are active agents in their development and bring specific characteristics, beliefs, values, motives, actions, and reactions to various contexts (Darling, 2007). For example, in considering an individual's gender, a wealth of research has demonstrated that the lived experience of adolescent girls and boys varies within and across contexts, including both family and peer settings (Hill, 2002; Denner & Dunbar, 2004; Way, 1995, 2013; West & Zimmerman, 1987). Importantly,

these differences are influenced by a variety of sources including those at the microsystem, mesosystem, macrosystem, and chronosystem levels. Therefore, to understand and explain adolescents' experiences within the context of various social settings, important personal characteristics, such as gender, must be considered. As such, the current study simultaneously explored how multiple immediate contexts (i.e., relationship with parents, peers, and siblings) and individual characteristics (i.e., gender) influence depressive symptoms in adolescence and emerging adulthood.

Family systems theory

A family systems perspective also was used to guide this study as multiple elements of this theory are useful for understanding longitudinal associations between familial relationships factors and depressive symptomology. Broadly, family systems theory posits that a family is a hierarchically structured and organized whole with multiple interdependent parts (Cox & Paley, 1997; 2003). Individuals exist within this system as both part of the whole and part of multiple subsystems. As adolescents and emerging adults have unique, yet interdependent relationships with their mothers, fathers, and siblings, this perspective calls for the exploration of the multiple familial influences on individuals' development and adjustment. Further, it emphasizes that experiences within one subsystem can influence both the functioning of the various other subsystems, as well as the family system as a whole. In addition, this theory highlights the importance of roles and rules in the family system. Given that the family is a self-stabilizing and self-organizing system, each family member must learn to fulfill and adjust to their changing roles within the family over time. It can be expected that as individuals' age and transition across developmental stages, the organization of the family will change, and therefore, roles and rules must be adjusted to return the

family to a state of stability (e.g., the transition from adolescence to emerging adulthood). Taken together, these theoretical propositions provide useful tenets for the exploration of how parent and sibling relationships factors influence adolescent and emerging adult depressive symptomology.

Depression

Depression is a prevalent psychological disorder, affecting individuals throughout the life span. Prevalence rates of depression in children are low and generally do not indicate differences in experiences between girls and boys (Kessler, Avenevoli, & Merikangas, 2001). Typically, experiences with depressive symptoms begin during adolescence and continue into young and later adulthood (Fergusson, Boden, & Horwood, 2007). The vast changes associated with growth and development during adolescence are commonly postulated as contributors to the development of depression (Thapar et al., 2012). With the onset of puberty, adolescents experience physical, psychosocial, and neurological changes (Arnett, 2016a; Steinberg & Morris, 2001). Notably, but not surprisingly, studies have indicated that experiences with mental health disorders during adolescence often translate into experiences with disorders in adulthood (Clark, Rodgers, Caldwell, Power, & Stansfeld, 2007; Eyre, & Thapar, 2014; Pine, Cohen, Gurley, Brook, & Ma, 1998). Studies suggest that major depressive disorders in early adulthood are predicted by age of onset, recurrent episodes, and duration of depressive episodes during adolescence (Pettit, Lewinsohn, Roberts, Seeley, & Monteith, 2009). These longitudinal connections highlight the pervasiveness of this disorder over time and across developmental periods.

The diagnosis of depression occurs through identification of symptomatic effects thought to be expressed due to this disorder. According to the DSM-5, when an

individual experiences a combination of loss of interest or appetite, insomnia, thoughts of death or suicide, and fatigue for a two-week period and these symptoms result in a change in daily functioning, major depressive disorder may be a likely culprit (Uher, Payne, Pavlova, & Perlis, 2014). Based on these clinical criteria, a variety of measures have been developed to assess depressive symptoms (e.g., the Center for Epidemiological Studies Depression Scale for Children [CES-DC]; Weissman, Orvaschell, & Padian, 1980). These measures allow researchers to examine varying levels of depressive symptoms in a wide range of populations, including adolescents, without having to conduct a clinical interview. Further, given that not all depressive symptoms are experienced at clinical levels (Wesselhoeft et al., 2013), these measures are particularly useful for capturing the multitude of experiences with depressive symptoms. Importantly, research indicates that varying levels of depressive symptoms influence adolescent adjustment. For example, Bertha and Balázs (2013) conducted a review of 27 studies exploring adolescents' experiences with subclinical depression. Generally, results indicated that subclinical levels of depression negatively impacted adolescents' quality of life and was predictive of future major depressive episodes. These findings highlight the need to consider a wide range of experiences with depression and illustrate the potential for longitudinal connections across developmental periods.

Gender

Gender differences in depressive symptomology is a robust finding in the literature (Bennett, Ambrosini, Kudes, Metz, & Rabinovich, 2005; Garber, 2006; Guan & Filigni, 2015; Johnson et al., 2011; Makri-Botsari, 2005; Petersen, Sarigiani, & Kennedy, 1991; Thapar et al., 2012). Generally, across adolescence and adulthood,

women are more likely to experience depression than men (SAMHSA, 2014). Estimates suggest that women are about two times as likely to develop depression (Nolen-Hoeksema, 2001). In a review of 24 studies examining adolescent depression, half of the studies found that being female was a risk factor for development of depression (Wesselhoeft et al., 2013). Data suggest similar patterns in emerging adulthood (Molina et al., 2014). Specifically, studies suggest that women are 2.5 times more likely to experience their first incidence of a major depressive disorder in emerging adulthood compared to men (Rohde, Lewinsohn, Klein, Seeley, & Gau, 2013). These rates of first incidence were comparable to rates in adolescence and higher than rates in later adulthood. Notably, these stark gender differences in adolescence and emerging adulthood exist despite the fact that during childhood, girls are no more likely than boys to experience depression (Kessler et al., 2001), drawing attention to the importance of the adolescent and emerging adult experience.

Although the causes of these gender differences in adolescent and emerging adult depression are not fully understood, scholars postulate that differences occur for social, psychological, and physiological reasons (Kessler, 2003; Lewinsohn, Rohde, & Seeley, 1998; Thapar et al., 2012). In adolescence, research has implicated girls' greater exposure and reactivity to interpersonal stress as a potential explanation for the gender differences in depression (Shih, Eberhart, Hammen, & Brennan, 2006). Similarly, studies suggest that stress is a particularly salient predictor of depression for girls, but not boys, when individuals have a negative attributional style (Mezulis, Funasaki, Charbonneau, & Hyde, 2009). Others have implicated the physiological changes associated with puberty as a potential cause for gender differences in depression prevalence rates (Angold, Worthman, Costello, 2003). Specifically, the

hormonal changes that occur during puberty are thought to influence the neurochemical processes related to depressive symptomology (Angold, Costello, Erkanli, & Worthman, 1999). Relatedly, research has suggested that the social consequences of puberty play a role in gender differences in depression. Yuan (2007) found that compared to pre-pubertal girls, post-pubertal girls, but not boys, reported higher depressive symptoms resulting from perceptions about their body and physical development.

Research on depression suggests that the gap between female and male depression declines during emerging adulthood. Galambos, Barker, and Krahn (2006) found that overall, trajectories of depressive symptoms declined from 18 to 25, suggesting that the gap between women and men's depression narrowed with age. Others have echoed these findings and shown that, among emerging adults, women's and men's experiences with depressive symptoms become more similar (e.g., Frye & Liem, 2011). However, despite this growing similarity, depression is more common among females during this developmental period (SAMHSA, 2014) and studies suggest that women are more likely to experience their first incidence of depression compared to men (Rohde et al., 2013). Parallel to adolescence, the physiological and contextual experiences are hypothesized as drivers of this gender difference (Kessler, 2003). For example, research posits continued hormonal fluctuations throughout women's lives (e.g., pregnancy or menopause) as well as the psychosocial aspects of women's lived experience (e.g., role-stress or coping styles) may play a role in depressive symptom gender differences among adults (Molina et al., 2014; Noble, 2005). Others have suggested that the stressors related to the developmental transitions associated with emerging adulthood (e.g., relationship instability, uncertainty about

one's competence and future, etc.) may cause the increased rates of depression, especially for girls (Rohde et al., 2013). These studies highlight how multiple levels from the bioecological systems model influence girls' experiences with depressive symptoms across developmental periods (Bronfenbrenner, 1979; Darling, 2007).

Taken together, research on adolescents and emerging adults suggests that the gender differences in depressive symptomology result from the complex interplay among biological, social, psychological, and experiential factors. Therefore, based on this research and the vast differences in the lived experiences between girls and boys and men and women, gender differences were examined in this study

Trajectories of depression

Individuals experience considerable change and development with their depressive symptoms over time. As such, multiple studies have attempted to examine this change using longitudinal modeling techniques, such as growth curve analysis (e.g., Shanahan, McHale, Crouter, & Osgood, 2008). Across studies, similar patterns of depression trajectories have been observed for adolescents. Kim, McHale, Crouter, and Osgood (2007) explored depression trajectories in a four year longitudinal sample of individuals from late childhood to late adolescence. Findings suggested that during childhood, depressive symptoms decreased from middle to late childhood for both girls and boys. In early adolescence, however, adolescents' depression trajectories took divergent, gendered paths. For girls, depressive symptoms increased until approximately 16 years old then tapered off into late adolescence. Conversely, there were minimal increases in boys' depressive symptoms throughout adolescence. Others have similarly found that depressive symptoms decreased into early adolescence uniformly for girls and boys, then took divergent paths in adolescence (Angold,

Erkanli, Silberg, Eaves, & Costello, 2002). This study found that, for girls, depressive symptoms increased throughout adolescence and peaked at grade 12. For boys, after a peak in grade 7, depressive symptoms decreased until grade 9 then increased slightly until grade 12. Bennis, Nederhof, Ormel, and Oldehinkel (2014) examined depressed mood and anhedonia symptoms (i.e., an individual's lack of general positive affect) throughout adolescence. Results suggested that although the proportion of adolescents experiencing anhedonia decreased uniformly over time by gender, depressed mood trajectories varied across girls and boys. The proportion of girls experiencing depression increased steadily, whereas the proportion of boys decreased from 11 to 16.5 years old, then increased until 19 years old. Of note, throughout adolescence, the proportion of girls with depressed mood was continually higher, with the greatest gap between girls and boys occurring at 16.5 years of age and 19 years of age, respectively. Overall, studies exploring changes in depression from childhood to adolescence or within adolescence not only highlight how depression changes over time, but also illustrate the diverse experiences of girls and boys.

Less longitudinal research has been conducted exploring depressive symptom trajectories among emerging adults or among individuals in the transition to emerging adulthood. However, extant research suggests a fairly uniform trajectory within this developmental period. For example, Galambos and Krahn (2008) examined depressive symptom trajectories throughout emerging adulthood (i.e., ages 20 to 29). Results suggested symptoms decreased significantly over time. This trajectory was consistently found even after accounting for family and demographic characteristics. Interestingly, trajectories did not vary by emerging adult gender. Others have shown similar trends in national samples in the transition from adolescence to emerging

adulthood. Meadows and colleagues (2006) found that both women and men showed declines in depressive symptoms over time. Notably, in addition to starting off with greater depressive symptoms, women showed steeper declines in symptoms over time. Expanding these findings, Frye and Liem (2011) explored trajectories of depression across various classes of individuals. Most individuals were classified as part of the dominant group of individuals with low, stable depressive symptoms (75%) and a small percentage of individuals belonged to the minority group with high, stable depressive symptoms (1%). Additionally, individuals were found to belong to both increasing (7%) and decreasing (17%) depressive symptoms groups. These findings highlight the diversity in experiences with depressive symptoms throughout this developmental period.

Taken together, although the aforementioned studies on depressive symptoms provide valuable insights into the experiences of adolescents and emerging adults, conclusions that can be drawn are limited for multiple reasons. First, the literature is greatly limited to examination of cross-sectional samples (Bertha & Balázs, 2013; van Lang, Ferdinand, Ormel, & Verhulst, 2006) or proportional analyses (Bennik et al., 2014). These studies hinder the understanding of adolescents' experiences of depression over time. Second, though connections between childhood and adolescence have been established (e.g., Kim et al., 2007), more research exploring changes in depressive symptoms from adolescence into emerging adulthood is needed given the high depressive symptom prevalence rates among these developmental stages (Meadows et al., 2006 is notable exception). Therefore, the current study aims to extend the literature by exploring longitudinal and cross developmental period trajectories of depressive symptoms from adolescence into emerging adulthood.

Social Relationships and Depression

Adolescence and emerging adulthood are particularly important times to explore associations between social relationship factors and depressive symptoms as there are substantial shifts across familial and extrafamilial contexts during these periods (Arnett, 2000; Steinberg & Morris, 2001). The child-parent relationship tends to fluctuate as youth search for their identity, seek autonomy, and explore new social settings and roles (Brown & Bakken, 2011). Peers become more salient sources of influence and take up considerably more of adolescents' time than in the past (Berndt, 2002; Lam, McHale, & Crouter, 2014). Further still, sibling relationships characterized by conflict in childhood often transition into relationships characterized by greater intimacy and equality (Furman & Buhrmester, 1985; 1992). Notably, research suggests adolescents simultaneously draw social support from parents, peers, and siblings to handle a variety of adjustment issues, including depression (e.g., Johnson et al., 2011). For example, research suggests that adolescents informally seek support for dealing with their depression from parents, peers, and siblings, and that each source uniquely influences adolescents' decisions about treatment (Wisdom & Agnor, 2007). Similarly, studies suggest emerging adult college students are most likely to seek support for mental health problems from their family and friends (Quinn, Wilson, MacIntyre, & Tinklin, 2009). These findings draw attention to the importance of simultaneous examination of the multiple social influences in adolescents' and emerging adults' lives. Therefore, the current study examined associations between parental, peer, and sibling relationship factors and depression trajectories from adolescence into emerging adulthood.

Parents

As central members of the family system, parents are an important influence in the lives of their children across the life-span (Heath, 2009). However, as individuals age, relationship dynamics within child-parent dyads and within the family undergo substantial changes (Arnett, 2016b; Smetana et al., 2006; Steinberg & Morris, 2001). During adolescence, youth are actively working toward the central developmental task of finding their identity and experience considerable changes across physical and cognitive domains (Arnett, 2016a). Similarly, during emerging adulthood, individuals are still working toward identity formation and experience considerable instability and change within social settings, relationships, and economic domains (Arnett, 2000). As adolescents and emerging adults seek greater autonomy over their lives and decisions, parents are challenged with providing guidance while relenting some control (Fingerman & Yahirun, 2016). Although the need for parental support lessens with age (Guan & Fuligni, 2015), parents are still central in many domains of their children's lives, including their mental well-being (Telzer & Fuligni, 2013).

Adolescent-parent relationships and depression

Studies repeatedly have found links between a variety of parenting behaviors and practices and adolescent depression. Research suggests that parental support and satisfaction with support are related to lower levels of depressive symptoms within both community and high-risk samples of adolescents (Guan & Fuligni, 2015; Johnson et al., 2011). Harper, Padilla-Walker, and Jensen (2014) found that quality relationship with fathers, but not mothers, was negatively related to later adolescent depression for girls and boys, after controlling for effects of siblings and peers. Others have shown that relationship quality with mothers (i.e., trust, communication, and alienation)

predicts future adolescent depression, above and beyond past depression (Allen et al., 2006). Studies also have demonstrated connections between parental rejection (Hale, Van Der Valk, Engels, & Meeus, 2005), adolescent attachment style with parent (Herring & Kaslow, 2002), and parental acceptance (Leidy et al., 2011) and adolescent depression.

Communication has long been hypothesized as an important element of the adolescent-parent relationship (Cernkovich & Giordano, 1987; Noller & Bagi, 1985). Past research has linked adolescent-parent communication with important outcomes, including self-esteem (Enger, Howerton, & Cobbs, 1993), coping and family satisfaction (Jackson, Bijstra, Oostra, & Bosma, 1998), and self-harm (Tulloch, Blizzard, & Pinkus, 1997). Importantly, adolescent-parent communication has also been linked with adolescent depression. Yu and colleagues (2006) found that adolescent perceptions of impaired communication with their parents were positively associated with depression. Further, depressed youth were less likely to describe their communication with parents as positive or open. Similarly, research suggests that among adolescent girls diagnosed with depression, both adolescents and their fathers reported more problematic communication within the relationship (Demidenko Manion, & Lee, 2015). Landman-Peeters et al. (2005) found a three-way interaction between gender, perceived social support, and problems in parent-adolescent communication. Probing this interaction indicated that problems in parent-adolescent communication was more strongly related to depression in the context of low social support. This effect was particularly salient to girls with high levels of problematic communication with parents.

Further, studies have examined adolescent-parent communication as a protective factor in adverse contexts, such as problem parental drinking. For example, Ohannessian (2011) found that the relationship between paternal problem drinking and depression was moderated by open-communication with mothers and fathers. Similarly, Ohannessian (2012) found that adolescent-mother communication mediated the relationship between maternal problem drinking and adolescent depression over time. Maternal problem drinking negatively predicted adolescent-mother communication, which, in turn, negatively predicted adolescent depression. Importantly, Ohannessian's findings point to the importance of adolescent gender as the moderating and mediating roles of communication were only found for girls. These findings are in line with the principles of family systems theory as they illustrate the unique effects of various family subsystems on adolescent adjustment. Taken together, previous research highlights adolescent-parent communication as a key factor for understanding adolescent depression and that adolescent and parent gender play critical roles in these relationships. However, because most studies examining these relationships used cross-sectional samples and did not explore potential variability in depressive symptoms, the picture of how adolescent-parent communication predicts changes in adolescent depression still is incomplete.

Emerging adult-parent relationships and depression

Parents continue to play a central role in the lives of their children during emerging adulthood. Although emerging adults are often transitioning to settings (e.g., independent living) and experiences separate from parents and parental influence (e.g., new romantic or work relationships), parents continue to be a source of guidance and support (Fingerman & Yahirun, 2016). One area where parental influence can be

seen is with emerging adults experiences with depression. Galambos and colleagues (2006) found that conflict with parents was related to greater depressive symptoms. Interestingly, those with the greatest levels of conflict had steeper declines in depressive symptomology throughout emerging adulthood. In another study, Meadows et al. (2006) explored the effects of parental support on trajectories of depressive symptoms from adolescence to emerging adulthood. Results suggested that both maternal and paternal support was negatively associated with depressive symptoms during adolescence but not during emerging adulthood. Perhaps these findings can be explained by changes in relationships that occur over time as emerging adults and their parents adapt to the changing rules and role of the family system and the separation that often occurs during this period (Conger & Little, 2010; Cox & Paley, 1997). In addition, some research has shown the lasting effects of parenting experiences in adolescence on emerging adult adjustment (Holahan, Valentiner, & Moos, 1994). Liem, Cavell, and Lustig (2010) found that authoritative parenting in adolescence predicted depressive symptoms in emerging adulthood, although this longitudinal effect was small.

Like in adolescence, communication continues to play an important role in the emerging adult-parent relationship. Although frequency of contact decreases (Conger & Little, 2010), emerging adults report more open communication with their parents compared to when they were younger (Lefkowitz, 2005). Further, research suggests communication with parents can help emerging adults adjust to potentially novel challenges associated with this developmental period. For example, communication with parents about finances was positively associated with subjective well-being and

negatively associated with financial stress and psychological distress (Serido, Shim, Mishra, & Tang, 2010).

Although this and other work suggests communication with parents during emerging adulthood may be important for adjustment and navigation through this developmental period, studies exploring the effects of more diverse forms of emerging adult-parent communication and depressive symptoms are lacking. Further, and importantly for this study, there is a gap in the literature of studies which explore the long term impact of adolescent-parent communication on trajectories of depressive symptoms across developmental periods. Given this gap, this study aims to explore how open and non-problematic communication between adolescents' and their mothers and fathers predicts trajectories of depression into emerging adulthood.

Peers

Peers become increasing salient sources of influence and socialization agents during adolescence and emerging adulthood (Barry, Madsen, & DeGrace, 2016; Berndt, 2002; Brown, 1990; Brown & Bakken, 2011). Although evidence supports the importance of peers throughout childhood (e.g., Hay, Payne, & Chadwick, 2004) and adulthood (e.g., Carmichael, Reis, & Duberstein, 2015), the unique developmental and social changes that occur during adolescence and emerging adulthood foster individuals' engagement within these egalitarian relationships in unique ways. Research suggests that during the transition from childhood to adolescence, individuals seek out social connections with peers (Azmitia, Ittel, & Radmacher, 2005; Chu, 2005), begin to spend considerably more time with peers (Lam et al., 2014), and increasingly rely on peers as confidants, models, and sources of support (Hartup, 1993; Smetana et al., 2006). In emerging adulthood, peers similarly serve as important

social supports as individuals move away from their family of origin and toward more independent adult roles (Barry et al., 2015).

The research on peers has drawn attention to both the positive and negative influence of peers on outcomes across developmental and adjustment domains (Brechwald & Prinstein, 2011). For example, studies have found both concurrent and longitudinal associations between peer interactions and adolescent (Van Ryzin, Fosco, & Dishion, 2012) and emerging adult (Mehta, Alfonso, Delaney, & Ayotte, 2014) substance use behaviors. However, this literature coexists with a substantial number of studies indicating that interactions or experiences with peers are associated with a range of positive outcomes. Birkeland, Breivik and Wold (2014) found that acceptance from peers was protective for adolescents' global self-esteem among those who reported low closeness with parents. Among emerging adults, emotional closeness with peers has been associated with identity commitment (Johnson et al., 2007), a central developmental task of this age group. These studies highlight how adolescent- and emerging adult-peer relationships are associated with a variety of important adjustment outcomes.

Adolescent-peer relationships and depression

Given the centrality of peers in adolescents' lives, it is not surprising that experiences within these extrafamilial relationships have been linked with depression in adolescence (e.g., Johnson et al., 2011). As adolescents spend more time with their peers, these microsystem level influences have increasing importance in their lives. One particularly robust finding in adolescent depression research is the association with peer rejection. In a recent review of the literature, Platt, Kadosh, and Lau (2013) suggested that peer rejection is bi-directionally related to depressive symptoms in

adolescence and the reciprocal nature of this relationship may contribute to the maintenance of depression over time. Others have demonstrated that adverse relationship experiences (e.g., bullying or victimization) by peers are related to depression in adolescence. For example, research has shown that traditional bullying (i.e., bullying in person) and cyberbullying from peers were both concurrently and longitudinally positively predictive of adolescent depressive symptoms (Gómez-Guadix, Orue, Smith, Calvete, 2013; Reed et al., 2015). Attempting to further understand the importance of social context, Lam and colleagues (2014) examined the effects of time spent with peers and adolescent depressive symptoms in both supervised and unsupervised settings. Results indicated that adolescents who spent more than average unsupervised time with opposite-sex peers were more likely to report depressive symptoms one year later. Buck and Dix (2012) found that social inhibition or shyness within social situations was negatively correlated with popularity and friendship quality. Further, social inhibition was associated with more depressive symptoms, underscoring the importance of engaging within these important social relationships. Studies also have demonstrated the long-term, negative impact of peer relationships on depression. Chango, Allen, Szwedo, and Schad (2014) found that young adolescents who were unable to assert autonomy during hypothetical disagreements without ostracizing peers had lower levels of friendship competence in late adolescence, which, in turn, was related to depressive symptoms in young adulthood. These studies demonstrate how a variety of negative peer relationship experiences are associated with adolescent depressive symptoms.

However, studies also have explored the effect of positive elements of peer relationships on adolescent depressive symptoms. For example, best friend

relationship quality has been shown to negatively predict adolescent depression two years later, after controlling for sibling and parent relationship factors (Harper et al., 2014). Further, Harper and colleagues (2014) found that this longitudinal association was stronger for girls than for boys. Similarly, research has shown that although social skills in early adolescence were positively related to friend, parent, and teacher support in middle adolescence, only friend support for girls predicted lower depressive symptoms in late adolescence (Nilsen, Karevold, Røysamb, Gustavson, & Mathiesen, 2013). Research repeatedly has found an inverse relationship between social support and adolescent depression (Burton, Stice, & Seeley, 2004; Licitra-Klechler & Waas, 1993). Auerbach and colleagues found a longitudinal, positive relationship between interpersonal stress (with parents and peers) and depressive symptoms. However, this relationship was moderated by classmate peer support, suggesting that support from larger peer networks can protect adolescents against the negative effects of stress on depressive symptoms (Auerbach, Bigda-Peyton, Eberhart, Webb, & Moon-Ho, 2011). In line with this finding, Cooley, Fite, Rubens, and Tunno (2015) found a positive relationship between relational victimization and adolescent depressive symptoms. However, this relationship was moderated by general peer social support, such that this association only existed for those who reported low levels of social support. Taken together, both Auerbach et al.'s and Cooley et al.'s findings suggest that although adverse experiences with peers is related to adolescent depressive symptoms, support from other peers can be protective for adolescents. From a bioecological systems perspective (Bronfenbrenner, 1979), this finding supports the notion that the interacting microsystem relationships (i.e., different sets of peers or peer groups) may significantly influence adolescent adjustment.

There is substantial evidence of the varied experiences with peers and depression across adolescent girls and boys (e.g., Rudolph, 2002). Rose and Rudolph (2006) conducted an extensive review of the adolescent-peer relationship processes literature with a particular focus on gender differences. In addition to noting the prevalence of varying experiences with depression between girls and boys, the authors also highlight research drawing attention to the reasons for and potential pathways by which peer relationships factors differentially influence adolescent depression. Generally, they found a positive and stronger link between peer relationship experiences and depression for girls because a) girls tend to worry more about peer approval and their peer relationship status b) girls are more susceptible to interpersonal stress, and c) girls relational victimization is more strongly associated with depression than for boys. In line with the aforementioned findings, Falci and McNeely (2009) found that although having a same-sex close friend was associated with lower depressive symptoms for both girls and boys, experiences with depressive symptoms differed by social network size and cohesion within peer relationships. For girls, having a large social network with low levels of cohesion was related to higher levels of depressive symptoms. Conversely, for boys, having a large social network with low levels of cohesion was related to lower levels of depressive symptoms. Consistent with Rose and Rudolph's conclusions, perhaps because girls tend to regard friendships more intimately, having many friends is not viewed as protective as they naturally seek closer more intimate bonds. In sum, this literature underscores the importance of acceptance and bonds between adolescence and their peers and adolescent gender as influential predictors of depressive symptoms.

Emerging adult-peer relationships and depression

Peers are an important social connection and support for emerging adults (Barry et al., 2015) and research suggests that establishing successful friendships in this stage is important for friendships in later developmental stages (Roisman, Masten, Coatsworth, Tellegen, 2004). During emerging adulthood individuals also begin to engage in longer and more serious romantic relationships compared to adolescents (Arnett, 2000). Experiences in both platonic and romantic relationships have been linked with depressive symptoms. Among college students, studies suggest that those who experience greater social support from friends experience lower levels of depression (Jenkins, Belanger, Connally, Boals, & Durón, 2013). Similarly, both satisfaction with face-to-face social support and virtual social support (e.g., via Facebook) were negatively related with emerging adult depressive symptoms (Wright et al., 2013). Taylor, Doane, and Eisenberg (2014) explored concurrent and longitudinal connections between social support from peers and internalizing symptoms (i.e., depression and anxiety). Concurrent findings suggested a negative relationship between peer support and internalizing symptoms. However, longitudinal models suggested that internalizing problems negatively predicted later perception of peer support. This finding may suggest this relationship is reciprocal in nature.

Like platonic friendships, romantic relationships have been linked with depressive symptoms in emerging adults, although in complex ways. Davila (2010) reviewed the literature on romantic relationships in emerging adulthood and found mixed results. Studies suggested that engagement in romantic relationships was both positively and negative associated with depressive symptoms. For example, Cramer (2004) found that among emerging adults, reduced depression was important for

relationship satisfaction. Specifically, individuals' perceptions of support from their partner were negatively related to depressive symptoms which, in turn, were negatively related to relationship satisfaction. However, research also suggests that elements of romantic relationships may enhance depressive symptoms. For example, relationship dissolution, a natural part of many relationships, has been linked with depressive symptoms. Studies show that emerging adults who were more distressed about a recent breakup reported higher depressive symptoms than those who less distressed about a recent breakup (Field, Diego, Pelaez, Deeds, Delgado, 2009). Notably, girls were more likely to be in the higher distress group than boys. Further, romantic experiences in uncommitted relationships have been shown to adversely influence emerging adult depressive symptoms. Studies suggest that girls are particularly susceptible to depressive symptoms after engaging in uncommitted casual sex (Fielder & Carey, 2010; Grello, Welsh, & Harper, 2006). Taken together, this research suggests perhaps it is the nature of the relationship that drives the association between romantic involvement and depressive symptoms in emerging adulthood. This research is particularly important when studying peers as studies suggest that emerging adults frequently list their romantic partner as their close friend in research (Shulman & Connolly, 2016).

Although literature suggests that peers and romantic partners play a central role in the lives of emerging adults, the literature examining depression is limited. This is particularly true for studies that explore how experiences with friends in adolescence predict trajectories of depression into emerging adulthood. Therefore, the current study explored the association between peer support and trajectories of depressive symptoms from adolescence to emerging adulthood.

Siblings

A multitude of studies suggest that siblings play influential roles in the lives of individuals across the life-span (Brody, 1998; Dunn, 2007; East, 2009). Within adolescence, siblings serve as important socialization agents and sources of support within the family (McHale, Updegraff, & Whiteman, 2012; Whiteman, Becerra, & Killoren, 2009; Whiteman & Christiansen, 2008; Yeh & Lempers, 2004). Although, research on sibling relationships in emerging adulthood is still limited comparatively, studies suggest that beyond adolescence, sibling relationships tend to becoming more egalitarian and cooperative as individuals take on adult roles and experience greater separation (Cicirelli, 1991). Generally, research suggests that emerging adults report positively about their sibling relationships (Milevsky, Smoot, Leh, & Ruppe, 2005). The centrality of the sibling influence on developmental and adjustment outcomes has been repeatedly demonstrated by studies showing the independent and unique influence of siblings on adolescent and emerging adult outcomes, after accounting for other social influences, such as parents or peers (e.g., Defoe et al., 2013; Milevsky, 2005; Pike, Coldwell, & Dunn, 2005).

Within the relatively recent history of sibling research, studies have postulated several key dimensions of the sibling relationship for research consideration. Specifically, relationship characteristics, such as warmth or closeness, relative power or status, competition, conflict, and rivalry, have been examined (Furman & Buhrmester, 1985; Whiteman, McHale, & Crouter, 2011). Research has linked sibling intimacy with increases in peer competence (Kim et al., 2007) and sibling conflict with later anxiety and delinquent behavior (Stocker, Burwell, & Briggs, 2002). Additionally, researchers have noted how these sibling relationship dynamics change

over time. For example, sibling relationships often are demarcated by conflict and antagonism in childhood and adolescence. However, as individuals mature, these relationships shift into more egalitarian standings (Cicirelli, 1991; Furman & Buhrmester, 1985; 1992). With respect to sibling intimacy and conflict, Kim, McHale, Osgood, and Crouter (2006) found that intimacy was stable throughout adolescence for same-gender sibling dyads. Alternatively, cross-gender dyads showed a curvilinear pattern of change in intimacy over time. Further, reports of conflict between siblings decreased over time but did not vary across the different dyad gender constellations. Extending these findings into emerging adulthood, some studies have found that sibling relationships remain stable throughout the transition from adolescence to young adulthood (Guan & Fuligni, 2015).

The bioecological systems model points to the importance of the individual and the characteristics they bring to settings or interactions (Bronfenbrenner & Morris, 2006). Supporting this theory, various structural or demographic characteristics have been highlighted as central elements for understanding the lived experiences and influence of siblings in adolescence and emerging adulthood (Dunn, 2007; Conger & Little, 2010; Feinberg, Solmeyer, & McHale, 2012; Furman, & Buhrmester, 1992). One structural characteristic of the adolescent-sibling dyad is gender. Research indicates that both the gender of the adolescent or emerging adult and the gender of the sibling are important for consideration (e.g., Whiteman et al., 2011). Studies have found that sister-sister sibling dyads tend to be characterized by greater intimacy, whereas sibling dyads which include a brother experience more conflict (e.g., Furman, & Buhrmester, 1992; Kim et al., 2006). Similarly, others have found that generally, girls report more affection, caring, or intimacy toward siblings than boys in both

adolescent and emerging adult samples (Cole & Kerns, 2001; Harper et al., 2014; Milevsky et al., 2005).

The age difference between siblings and birth order also have been noted as important elements of the sibling relationship across developmental periods. For example, in cross-sectional studies, the association between older and younger sibling alcohol use was mediated by younger siblings' belief that older siblings would facilitate their alcohol use (Samek, McGue, Keyes, & Iacono, 2015). Importantly, these effects were stronger when siblings were closer in age (i.e., within 2 years of age). Similar findings have been observed longitudinally with drug use (e.g., Windle, 2000). These patterns have been found in other adjustment domains as well. Widmer and Weiss (2000) found that during adolescence older sibling support was negatively associated with depressive symptoms and delinquent attitudes and positively associated with resourcefulness, school engagement, and school success when younger siblings had a positive image of their older sibling. In emerging adulthood, cross-sectional analyses suggest that compared to younger emerging adults, older emerging adults reported more warmth and less conflict with siblings (Milevsky et al., 2005). Further, Whiteman et al., (2011) found that birth order predicted changes in conflict and intimacy in the transition from adolescence to emerging adulthood. Specifically, secondborn siblings reported greater declines in conflict and greater increases in intimacy than firstborns.

Although the importance of sibling demographic characteristics appear to be a fairly robust finding in the literature, it should be noted that differences based on the gender constellation of the sibling dyad, age difference, and birth order are not consistent (e.g., Kim et al., 2006; Samek et al., 2015). However, based on the existing

literature and the emphasis of bioecological systems perspectives on the importance of individual characteristics (Darling, 2007), there is ample support to suggest that research should examine both relationship and structural characteristics of adolescent-sibling dyads when exploring developmental and adjustment outcomes. Therefore, the structural characteristics of the sibling dyad (i.e., sibling gender, age gap between siblings, and birth order) were included as controls in the current study.

Adolescent-sibling relationships and depression

The research connecting sibling relationship characteristics and adolescent depression is limited compared to studies examining parent and peer relationships. However, some studies have begun to unearth these important connections through both cross-sectional and longitudinal research. Research has shown that parental differential treatment is associated with depressive symptoms in adolescence. Richmond, Stocker, and Rienks (2005) explored how changes in sibling relationship quality and parental differential treatment predicted adolescent depressed mood for both the older and younger members of sibling dyads. Results indicated that for both the younger and older siblings, increases in the sibling relationship quality was associated with less depressed mood. Parental differential treatment also was related to depressed mood but only for younger siblings. When younger siblings felt as though their older sibling was favored by parents, younger siblings' depressed mood increased over time. Adolescents' depressive symptoms also have been shown to be indirectly affected by sibling relationships through social comparison. For example, Shanahan et al. (2008) found that when girls, but not boys, reported less parental warmth compared to their sibling, they tended to report higher depressive symptoms. This effect was stronger for older siblings, compared to younger siblings. Given that

each unique dyad exists within the larger family system (Cox & Paley, 2003), it is not surprising that experiences of differential treatment can adversely affect an individual's adjustment.

In addition to differential treatment, relationships between sibling support, warmth, and hostility and depression have been found. Studies show concurrent, negative associations between sibling support and withdrawn/anxious or depressed behaviors in community (Branje, van Lieshout, van Aken, & Haselager, 2004) and high-risk samples (Johnson et al., 2011). These studies also suggested that the strength of the association between sibling support and depressive symptoms is stronger for girls than for boys. Others have attempted to study this association through consideration of multiple sibling relationship dynamics. McHale, Whiteman, Kim, and Crouter (2007) used cluster analysis to create groups based on older and younger sibling reports of positivity, negativity, and control within their sibling dyad. Findings indicated a three cluster solution: positive relationship type, negative relationship, and distant type. Adolescents belonging to the negative relationship type group (i.e., above average negativity and control and below average positivity) reported more depression symptoms than those in the positive (i.e., below average negativity and control and above average positivity) or distant type groups (i.e., below average negativity, and positivity). It should be noted, however, that the adolescents and siblings in this sample were all from two-parent African American households, therefore limiting the generalizability to other individuals and groups.

Longitudinal and cross-developmental period associations between sibling relationship dynamics and depression also have been examined (Buist et al., 2014). Research has found sibling relationship characteristics to be important predictors of

adolescent depressive symptoms, after controlling for parental and peer relationship factors (e.g., Padilla-Walker, Harper, & Jensen, 2010). For example, Kim et al. (2007) found that depressive symptom trajectories from late childhood through adolescence were negatively associated with sibling intimacy and positively related with sibling conflict, after controlling for parent effects. Further, the association between changes in sibling intimacy and changes in depressive symptoms was moderated by gender, such that the inverse relationship was only statistically significant for girls. Similarly, studies have shown that sibling conflict in late childhood is related to early adolescent depressed mood, after controlling for adolescent and sibling gender, hostility in adolescent-parent relationships, and marital conflict (Stocker et al., 2002). Some research also suggests that sibling relationship quality in childhood and adolescence has long-term effects on depression into adulthood. A 30-year prospective study of men suggested that relationship quality with siblings before age 20 (as indicated by degree of closeness and rivalry or conflict) predicted men's occurrence of major depression and frequency of mood-altering drug use at age 50 (Waldinger, Vaillant, & Orav, 2007). These effects were found after controlling for the quality of childhood relationships with parents and family history of depression, demonstrating the long-term longitudinal impact of siblings. Overall, these findings draw attention to the importance of exploring adjustment at the chronosystem level and highlight the unique effects of the varying subsystems within the family (Bronfenbrenner & Morris, 2006; Cox & Paley, 1997). Although, not all research has found significant longitudinal effects of sibling relationship characteristics on depressive symptoms (e.g., Harper et al., 2014) and this body of work is relatively limited, findings support that warmth and

hostility in sibling relationships have potentially important effects on adolescent adjustment.

Emerging adult-sibling relationships and depression

Although relatively less research has been conducted, like in adolescence, a variety of sibling relationship characteristics have been shown to be important factors for understanding depression in emerging adulthood. For example, research suggests that perceptions of differentiation or differential treatment among siblings are related to depressive symptomology. In a sample of both emerging adults and middle aged adults, perceptions of sibling preference from mothers was positively associated with depressive symptoms (Pillemer, Suito, Pardo, & Henderson, 2010). Extending this work, Jenson and colleagues explored the effects of both maternal and paternal differential treatment on emerging adult depressive symptoms (Jenson, Whiteman, Fingerman, & Birditt, 2013). Findings suggested that mother favoritism positively and father favoritism negatively predicted depressive symptoms. However, paternal favoritism interacted with perceptions of magnitude of differential treatment and sibling gender composition. Specifically, depressive symptoms were greatest for the less favored sibling from a same-gender dyad.

Cross-sectional and longitudinal studies have highlighted how sibling relationship factors play important roles in understanding emerging adult depressive symptoms. In a sample of undergraduate, graduate, and community emerging adults, Milevsky (2005) found that individuals who reported higher levels of support from their siblings had lower levels of depression. Further, Milevsky found that support from siblings compensated for low levels of support from mothers, but not fathers. These findings are in line with the family system perspectives that underscore the

important of exploring multiple dyads and relationships within the family (Cox & Paley, 1993). Research also suggests that sibling support is important in the transition from adolescence to emerging adulthood. Guan and Fuligni (2015) found that yearly increases in sibling support were associated with decreases in depressive symptoms. Importantly, this relationship was stronger for girls than boys, again highlighting the importance of looking at demographic and structural characteristics of individuals in sibling dyads.

Although this literature makes important contributions to the understanding of the association between sibling relationship characteristics and emerging adult depression, it is limited in several ways. First, despite the fact that warmth and conflict within sibling relationships have been identified as important elements of sibling relationships, extant research has failed to explore these associations with depressive symptoms. Second, the lasting effect of sibling relationships characteristics on emerging adult depression have yet to be examined. Although some long-term work has been conducted (e.g., Waldinger et al., 2007), connections between adolescence and emerging adulthood have yet to be explored. Therefore, in the current study, the effect of sibling warmth and hostility during adolescence on depression trajectories into emerging adulthood was examined.

Present Study

There is a strong body of literature indicating that depression is an important developmental and adjustment outcome for adolescents and emerging adults that has both short and long term consequences (Eyre, & Thapar, 2014; Fergusson et al., 2007; Pescola et al., 2015; Pettit et al., 2009), particularly for girls (Thapar et al., 2012). Research also suggests that a range of depressive symptoms have implications for

adjustment (Bertha & Balázs, 2013; Wesselhoeft et al., 2013). Further, a variety of social relationship factors with parents, peers, and siblings have been uniquely associated with adolescent and emerging adult depressive symptoms (Guan & Fuligni, 2015; Harper et al., 2014). Based on this literature, this study has two research aims. First, the present study aims to extend this literature by exploring trajectories of depressive symptoms from adolescence to emerging adulthood for girls and boys. Second, this study seeks to examine the simultaneous influence of parent, peer, and sibling relationship factors on depressive symptom trajectories over time for girls and boys. Specifically, adolescent perceptions of communication with parents, close friend support, and sibling warmth and hostility were explored.

Grounded in previous research and bioecological and family systems theories, the following hypotheses were stipulated:

1. Girls are expected to have higher overall depressive symptoms and steeper declines over time.

2. Adolescents' perceptions of communication with parents, close friend support, and sibling warmth will be related to lower levels of initial depressive symptoms in adolescence. Conversely, perceptions of sibling hostility were expected to have the opposite effect. For trajectories of depression over time, it is expected that perceptions of adolescent-parent communication, close friend support, and sibling warmth in adolescence will inversely influence depression over time. Sibling hostility, however, is expected to have a positive effect on changes in depression over time.

Lastly, girls are expected to be more greatly influenced by parent, peer, and sibling relationship factors, compared to boys.

Chapter 3

METHODOLOGY

Participants

The sample for the current project was drawn from a larger longitudinal study (Adolescent Adjustment Project; Ohannessian, 2009). Data collection occurred over four time points starting in 2007 (Time 1), with annual follow-ups in 2008 (Time 2) and 2009 (Time 3). In 2014 (Time 4), participants were invited to participate in an additional follow-up. Adolescents were 16.09($SD = .69$) years old at the start of the study and over one half of the sample was female (55%). Generally, the majority of the sample identified as European American (60%), followed by African American (21%), Hispanic (11%), and Asian American (3%). Approximately 5% of the sample identified as “Other.” Only adolescents who reported having one sibling were included in the analyses ($N = 372$). On average, adolescents’ sisters were 14.67 ($SD = 2.19$) and brothers were 15.04 ($SD = 2.44$) years old. Adolescents were approximately 2.43 years older than sisters and 2.55 years older than brothers. Most participants had a younger sibling (65%). One half of the sibling dyads were of the same-gender (50%).

Procedures

Starting in the spring of 2007 (Time 1), adolescents from public high schools in Delaware, Maryland, and Pennsylvania were asked to participate in the study. Yearly follow-up data collection occurred in the spring of 2008 (Time 2) and 2009 (Time 3). Prior to data collection, information about the study and consent forms were mailed to parents. For Time 1-3, passive parental consent was used and parents who did not want their child to participate in the study were asked to contact the research team. Adolescent assent was obtained across all study waves. Those who had parental

consent and adolescent assent were administered a self-report survey by trained research staff. The survey took approximately 40 minutes to complete and participants were compensated for their time with a movie pass. An additional wave of data collection occurred in the spring of 2014 (Time 4) when participants were emerging adults. At Time 4, only participant consent was obtained. Participants completed an online web survey (or a mailed survey if they were non-responsive to the online survey invitation) and were compensated with a \$25 American Express gift card. Across all waves, individuals were informed that participation in the study was completely voluntary and that all data would be kept confidential. The study was approved by the University of Delaware's Institutional Review Board (see Appendix A).

Measures

Depressive symptoms

The Center for Epidemiological Studies Depression Scale for Children (CES-DC; Weissman et al., 1980) was used as an indicator of adolescent depressive symptomology at each wave of the study. Adolescents responded to 20-items about their feelings during the past week on a scale ranging from 1 (*Not At All*) to 5 (*A Lot*). Representative items include "I felt sad" and "It was hard to get started doing things." There were four items in this scale that were reverse coded before analyses. Greater scores indicated higher levels of depressive symptoms. This scale has been shown to be reliable in adolescent populations (O'hannessian, Lerner, Lerner, & von Eye, 1999). In the present sample, the Cronbach's alpha coefficient for the CES-DC ranged from .89 to .91 across the waves.

Gender

At Time 1, adolescents were asked to identify their gender as either male or female. Data were dummy coded for female (0 = male; 1 = female).

Adolescent-parent communication

The Adolescent-Parent Communication Scale (Barnes & Olson, 2003) was used to measure open (e.g., “My mother/father is always a good listener”) and problem (e.g., “I am careful about what I say to my mother/father”) communication between adolescents and both their mother and father. Response options ranged from 1 (Strongly Disagree) to 5 (Strongly Agree). Each subscale contained 10-items. The open and problem communication subscales were combined into a single measure of total adolescent-mother ($\alpha = .91$) and adolescent-father communication ($\alpha = .91$). Adolescent-mother and adolescent-father communication were examined separately in this study. Greater scores indicated greater open and less problematic communication with mothers and with fathers. This scale has demonstrated acceptable reliability and validity in past samples (Barnes & Olson, 2003; Rosnati, Iafrate, & Scabini, 2007). Adolescent-parent communication was assessed at Time 1.

Close friend support

The 6-item Close Friend subscale of the Self-Perception Profile for Adolescents (Harter, 1988) was used to assess adolescents’ perceptions of support from a close friend. Using a structured alternative format, adolescents were asked to evaluate a series of 6-items ($\alpha = .88$) on a scale ranging from 1 (Really not true for me) to 4 (Really true for me). A representative item is “Some kids have a close friend who they can tell problems to but other kids don’t have a close friend who they can tell problems to.” Other studies have found this scale to demonstrate acceptable

reliability and validity (Wichstorm, 1995). Close friend support was assessed at Time 1.

Sibling warmth and hostility

The Sibling Relationship Questionnaire (Slomkowski, Rende, Conger, Simons, & Conger, 2001) was used to assess adolescents' perceptions of warmth (e.g., "Act supportive and understanding toward you?") and hostility (e.g., "Criticize you or your ideas?") from their brother or sister in the last month. Only those who reported having one sibling (sister or brother) were included in the current study. The warmth ($\alpha = .89$) and hostility ($\alpha = .87$) subscales each included 6-items and response options ranged from 0 (Never) to 7 (Always). Sum scores were generated such that greater scores indicated greater perceptions of warmth or hostility from their sibling. This questionnaire has demonstrated acceptable reliability in past studies with adolescent samples (Howe, Karos, Aquan-Assee, 2011; Slomkowski et al., 2001). Sibling warmth and hostility were assessed at Time 1.

Sibling control variables

There were three sibling or adolescent-sibling-dyad control variables included in this study: sibling gender, age gap between siblings, and birth order. Sibling gender was dummy coded for female (0 = sibling was male; 1 = sibling was female). The age gap between siblings was calculated by subtracting the siblings age from the target adolescents age. Absolute values of the sibling age gap were used. Finally, a control was included to account for birth order of adolescents. Birth order was dummy coded for having a younger sibling (0 = adolescent has an older sibling; 1= adolescent has an older sibling).

Analytic Strategy

Growth curve modeling was used to address the study research aims (Raudenbush & Bryk, 2002). This analysis was selected as it allows for the exploration of the expected levels of depressive symptoms in adolescence (i.e., intercepts) and the trajectories of these symptoms (i.e., slopes) into emerging adulthood by gender. Further, both depressive symptoms intercepts and slopes can be predicted by gender and the various relationship factors (i.e., perceptions of adolescent-parent communication, close friend support, sibling warmth, and sibling hostility). Importantly, growth curve analyses allow for the exploration of the variability of depressive symptoms both within and between individuals.

To address the first study aim of examining depressive symptoms trajectories from adolescence to emerging adulthood for girls and boys, the following steps were completed. First, an unconditional means or intercepts only model (Raudenbush & Bryk, 2002; Singer & Willett, 2003) was examined. This model does not describe change in depressive symptoms over time but, rather, partitions variance in outcome to within (level 1) and between (level 2) components. In other words, this model illustrates the variability around the person-specific means and the grand mean. This model is useful as it allows for the assessment of how much variability at each level can be explained. Further, the interclass correlation coefficient (ICC) can be calculated from this model which signifies the proportion of variability in depressive symptoms that occurs between individuals ($ICC = \text{between-person variance} / (\text{between-person variance} + \text{within-person variance})$).

Second, an unconditional growth model with random intercepts and random slopes was examined. Preliminary data exploration suggested that a quadratic form of time should be tested given the non-linear trajectories of depressive symptoms over

time (see Figure 1). Therefore, in addition to linear time, quadratic time was included in the model. An unconditional growth model allows for the modeling of both *a*) individuals' depressive symptom trajectories over time and *b*) the variation in rates of change across individuals. The variance components of this model illustrate the deviation between individuals' actual and predicted trajectory as well as the variation in initial depressive symptoms and rates of change in depressive symptoms between-individuals. Examination of these variance components will determine if there is enough variability for the individual and social relationship factors variables to predict.

Finally, a conditional growth model with gender as a predictor of intercepts and slopes was examined. This model explored differences in girls and boys depressive symptoms at the start of the study (Time 1 or baseline) and if girls and boys have different slopes of depressive symptoms over time into emerging adulthood.

Equations for the unconditional means (Equation 1), unconditional growth (Equation 2), and conditional growth (Equation 3) models are displayed below. The equations are split into two levels to illustrate the within and between parts of the model. The level 1 part of the equation represents that within-person part of the model. In other words, this level signifies the change in depressive symptoms from adolescence to emerging adulthood for each individual *i* across *j* occasions. At level 1, the outcome (i.e., depressive symptoms) was predicted by the intercept (π_{0j}), linear (π_{1j}) and quadratic (π_{2j}) indices of time, and error (e_{ij}). The level 2 equation represents the between-person part of the model or signifies the variability in depressive symptoms between individuals. At level 2, differences in the level 1 parameters were explored across individuals. The addition of covariates, such as adolescent gender in

Equation 3, allowed for examination of potential causes of variability in depressive symptom trajectories between individuals. Further, random intercepts (r_{0j}) and slopes (r_{1j} and r_{2j}) were included to model potential differences in levels of depressive symptoms at the start of the study as well as differences in trajectories of depressive symptoms over time between individuals, respectively.

Equation 1: Unconditional means model

$$\text{Level 1: Depressive Symptoms}_{ij} = \pi_{0j} + e_{ij}$$

$$\text{Level 2: } \pi_{0j} = \beta_{00} + r_{0j}$$

Equation 2: Unconditional growth model

$$\text{Level 1: Depressive Symptoms}_{ij} = \pi_{0j} + \pi_{1j}(\text{Age}_{\text{Linear}}) + \pi_{2j}(\text{Age}_{\text{Quadratic}}) + e_{ij}$$

$$\text{Level 2: } \pi_{0j} = \beta_{00} + r_{0j}$$

$$\pi_{1j} = \beta_{10} + r_{1j}$$

$$\pi_{2j} = \beta_{20} + r_{2j}$$

Equation 3: Gender Conditional growth model

$$\text{Level 1: Depressive Symptoms}_{ij} = \pi_{0j} + \pi_{1j}(\text{Age}_{\text{Linear}}) + \pi_{2j}(\text{Age}_{\text{Quadratic}}) + e_{ij}$$

$$\text{Level 2: } \pi_{0j} = \beta_{00} + \beta_{01}(\text{Gender}) + r_{0j}$$

$$\pi_{1j} = \beta_{10} + \beta_{11}(\text{Gender}) + r_{1j}$$

$$\pi_{2j} = \beta_{20} + \beta_{21}(\text{Gender}) + r_{2j}$$

This study also aimed to examine the simultaneous influence of parent, peer, and sibling relationship factors on depressive symptom trajectories for girls and boys. To address this aim, adolescent perceptions of communication with mothers and fathers, close friend support, sibling warmth, and sibling hostility were included in the model as predictors of depressive symptoms intercepts and slopes. To assess whether these social relationship factors differentially influenced depressive symptoms intercepts and slopes for girls and boys, two-way interactions between each social relationship factor and gender were included in the model. As predictors of slopes,

these interactions represent the effect of social relationship factors on depressive symptom slopes over time for girls and boys (see Equation 4). Additionally, the sibling relationship structural control variables (i.e., sibling gender, age gap, and birth order) were included in these models.

Equation 4: Full Conditional model with gender and social relationship factors

$$\text{Level 1: Depressive Symptoms}_{ij} = \pi_{0j} + \pi_{1j}(\text{Age}_{\text{Linear}}) + \pi_{2j}(\text{Age}_{\text{Quadratic}}) + e_{ij}$$

$$\begin{aligned} \text{Level 2: } \pi_{0j} = & \beta_{00} + \beta_{01}(\text{Gender}) + \beta_{02}(\text{Adolescent-Mother} \\ & \text{Communication}) + \beta_{03}(\text{Adolescent-Father Communication}) + \beta_{04}(\text{Close} \\ & \text{Friend Support}) + \beta_{05}(\text{Sibling Warmth}) + \beta_{06}(\text{Sibling Hostility}) + \\ & [\beta_{07}(\text{Gender*Adolescent-Mother Communication})] + \\ & [\beta_{08}(\text{Gender*Adolescent-Father Communication})] + [\beta_{09}(\text{Gender*Close} \\ & \text{Friend Support})] + [\beta_{0-10}(\text{Gender*Sibling Warmth})] + [\beta_{0-} \\ & 11(\text{Gender*Sibling Hostility})] + \beta_{0-12}(\text{Sibling Gender}) + \beta_{0-13}(\text{Sibling} \\ & \text{Age Gap}) + \beta_{0-14}(\text{Birth Order}) + r_{0j} \end{aligned}$$

$$\begin{aligned} \text{Level 2: } \pi_{1j} = & \beta_{10} + \beta_{11}(\text{Gender}) + \beta_{12}(\text{Adolescent-Mother Communication}) + \\ & \beta_{13}(\text{Adolescent-Father Communication}) + \beta_{14}(\text{Close Friend Support}) + \\ & \beta_{15}(\text{Sibling Warmth}) + \beta_{16}(\text{Sibling Hostility}) + \\ & [\beta_{17}(\text{Gender*Adolescent-Mother Communication})] + \\ & [\beta_{18}(\text{Gender*Adolescent-Father Communication})] + [\beta_{19}(\text{Gender*Close} \\ & \text{Friend Support})] + [\beta_{1-10}(\text{Gender*Sibling Warmth})] + [\beta_{1-} \\ & 11(\text{Gender*Sibling Hostility})] + \beta_{1-12}(\text{Sibling Gender}) + \beta_{1-13}(\text{Sibling} \\ & \text{Age Gap}) + \beta_{1-14}(\text{Birth Order}) + r_{1j} \end{aligned}$$

$$\begin{aligned} \pi_{2j} = & \beta_{20} + \beta_{21}(\text{Gender}) + \beta_{22}(\text{Adolescent-Mother Communication}) + \\ & \beta_{23}(\text{Adolescent-Father Communication}) + \beta_{24}(\text{Close Friend Support}) + \\ & \beta_{25}(\text{Sibling Warmth}) + \beta_{26}(\text{Sibling Hostility}) + \\ & [\beta_{27}(\text{Gender*Adolescent-Mother Communication})] + \\ & [\beta_{28}(\text{Gender*Adolescent-Father Communication})] + [\beta_{29}(\text{Gender*Close} \\ & \text{Friend Support})] + [\beta_{2-10}(\text{Gender*Sibling Warmth})] + [\beta_{2-} \\ & 11(\text{Gender*Sibling Hostility})] + \beta_{2-12}(\text{Sibling Gender}) + \beta_{2-13}(\text{Sibling} \\ & \text{Age Gap}) + \beta_{2-14}(\text{Birth Order}) + r_{2j} \end{aligned}$$

In all models, time was centered around the average age at the start of the study or 16 years of age. All level 2 predictors were time-invariant as they were only assessed at one time point (Singer & Willett, 2003). In conditional models (see Equation 3 and 4), predictors of adolescent gender and social relationship factors were entered into models grand mean centered. This centering approach allowed for the model intercepts to be interpreted as the expected level of depressive symptoms for the average adolescent at the start of the study. In addition, across models, deviance chi-square tests were used to compare models with and without random effects to determine which model was the best fit to the data.

Data were assumed to be missing at random (MAR) or missing completely at random (MCAR) based on data collection procedures within and across the study time points. To address the issue of missing data, full information maximum likelihood estimation (FIML) was used. This estimation technique calculates parameters for individuals with and without complete data, therefore maximizing the number of cases that can be included in the analyses. FIML is not a data imputation method but rather uses all available observed data, therefore increasing the available data that can be used compared to listwise or pairwise missing data deletion. All analyses were completed in HLM (version 6) and Stata (version 12).

Chapter 4

RESULTS

Preliminary Analyses

Descriptive statistics and correlations among study variables are displayed in Table 1 and 2, respectively. Results suggest that although the average level of depressive symptoms decreased from adolescence into emerging adulthood for both genders, the declines were greater among girls. Generally, girls and boys reported similar levels of open and less problematic communication with mothers. However, boys reported slightly greater levels of open and less problematic communication with fathers than did girls. Levels of support from close friends were similar across gender. Finally, girls reported more warmth and less hostility with siblings than did boys. Bivariate correlations suggested that, broadly, associations among depressive symptoms across waves were stronger for girls than boys. Similarly, depressive symptoms across waves were more strongly related to parent, peer, and sibling relationship factors for girls than for boys. Moreover, for girls, there were stronger and more statistically significant correlations among the social relationship factors than for boys.

Table 1 Descriptive Statistics of Study Variables by Adolescent Gender

	Girls			Boys		
	<i>M(SD)</i>	<i>Min</i>	<i>Max</i>	<i>M(SD)</i>	<i>Min</i>	<i>Max</i>
Depressive Symptoms (T1)	37.23(11.17)	20	72	34.90(11.28)	20	73
Depressive Symptoms (T2)	36.76(11.59)	20	71	33.47(9.39)	20	57
Depressive Symptoms (T3)	36.31(10.22)	20	61	34.10(11.23)	20	70
Depressive Symptoms (T4)	30.33(9.35)	20	59	31.00(8.91)	20	55
Adolescent-Mother Communication	66.63(16.70)	28	100	66.86(15.00)	32	98
Adolescent-Father Communication	61.73(17.23)	20	99	64.78(16.09)	24	100
Close Friend Support	22.16(2.98)	6	24	20.28(3.78)	9	24
Sibling Warmth	25.19(8.74)	6	42	22.53(8.47)	6	42
Sibling Hostility	22.48(8.71)	6	42	23.46(8.43)	6	42

Note. "*Max*" = maximum reported score and "*Min*" = minimum reported score.

Table 2 Correlations among Study Variables by Adolescent Gender

	1	2	3	4	5	6	7	8	9
1. Depressive Symptoms (T1)	--	0.47***	0.21	-0.02	-0.16	-0.30***	-0.28***	-0.13	0.11
2. Depressive Symptoms (T2)	0.42***	--	0.36*	-0.01	-0.23*	-0.18	-0.12	-0.20	-0.07
3. Depressive Symptoms (T3)	0.21	0.24*	--	0.28	-0.03	-0.22	-0.32*	-0.33*	0.06
4. Depressive Symptoms (T4)	0.38**	0.51***	0.32*	--	-0.24	-0.19	-0.21	0.11	-0.33
5. Adolescent-Mother Comm.	-0.57***	-0.37***	-0.20	-0.41**	--	0.29***	0.22*	0.17*	-0.16
6. Adolescent-Father Comm.	-0.30***	-0.17	-0.06	-0.03	0.18*	--	0.22*	0.27**	-0.05
7. Close Friend Support	-0.15	-0.03	-0.37***	-0.20	-0.03	0.17*	--	0.11	0.03
8. Sibling Warmth	-0.12	-0.18*	-0.15	-0.14	0.35***	0.12	0.05	--	-0.13
9. Sibling Hostility	0.20**	0.09	-0.11	0.43**	-0.27***	-0.14	-0.01	-0.47***	--

Note. Correlations for girls are on the bottom panel and boys are on the top panel. The adolescent-parent communication, close friend support, and sibling relationship characteristics variables were measured at Time 1. Adolescent-mother and adolescent-father communication are abbreviated as “comm.” in this table.

* $p < .05$; ** $p < .01$; *** $p < .001$.

Examination of individuals' depressive symptom scores over time through spaghetti plots highlighted the immense variability in trajectory patterns within and across gender (see Figure 1). Generally, there appears to be a decrease of depressive symptoms over time for both genders. Box plots (see Figure 2) illustrate greater median depressive symptoms for adolescent girls, compared to boys. However, in emerging adulthood, these plots suggest that women and men have more similar levels of depressive symptoms, though women reported a wider range of symptoms.

Figure 1 Spaghetti Plots of Depressive Symptoms Over Time for Adolescent and Emerging Adult Males and Females

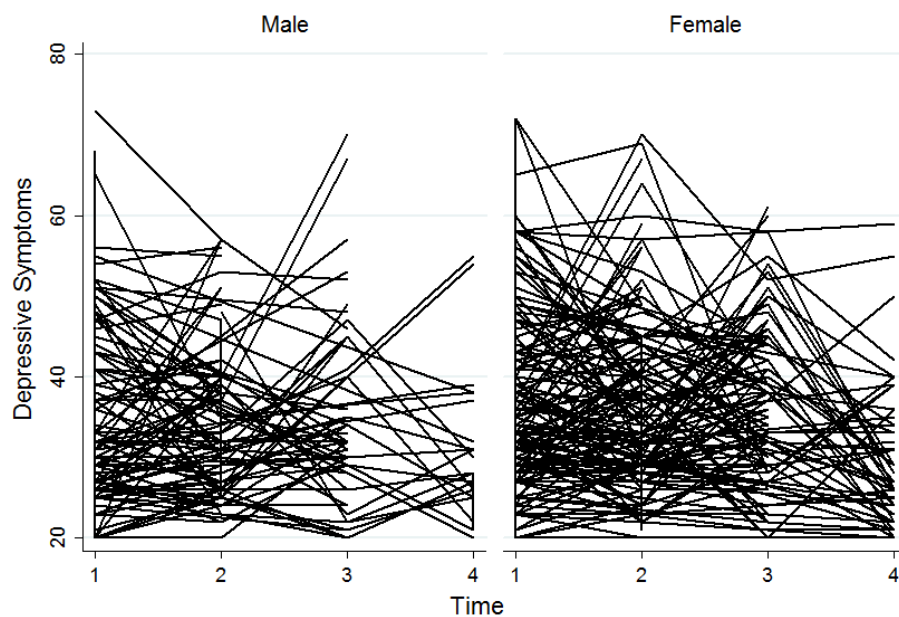
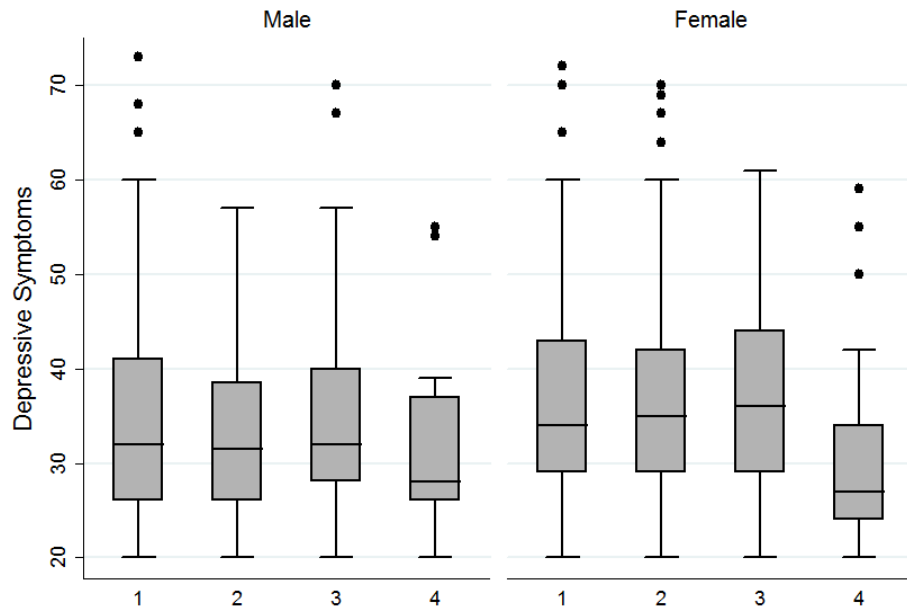


Figure 2 Box Plots of Depressive Symptoms Over Time for Adolescent and Emerging Adult Males and Females.



Primary Analyses

Unconditional means model

Growth curve modeling was used to explore depressive symptoms trajectories from adolescence to emerging adulthood by gender. First, an unconditional means model was conducted to examine variability around person-specific means and the grand mean (see Equation 1). Further, this model was used to calculate the interclass correlation coefficient (ICC) which signifies the proportion of variability in depressive symptoms that occurs between individuals. Results are displayed in Table 3 under Model A. Examination of variance components suggested that there was considerable variability in depressive symptoms within individuals over time ($r_0 = 40.91; p < .001$) and that individuals differ from one another in levels of depressive symptoms ($e =$

74.20). Calculation of the ICC indicated that 34% of the variability in depressive symptoms can be attributed to differences between individuals.

Unconditional growth model

Next, an unconditional growth model was conducted to assess the variability in intercepts and slopes of depressive symptoms across individuals through examination of the variance components (see Equation 2). Results are displayed in Table 3 under Model B. Deviance tests were used to compare models with random intercepts and random slopes to determine the best fitting model to the data. Results suggested that an unconditional growth model with random intercepts ($r_0 = 54.66, p < .001$) and random linear slopes ($r_1 = .36, p > .05$) was a better fit to the data than a model with only random intercepts ($\chi^2 = 6.97(2), p < .05$). Further, a model with random intercepts, linear slopes, and quadratic slopes was determined to not be a better fit to the data ($\chi^2 = 6.41(3), p > .05$). These variance components suggest that there is important variation in intercepts and linear slopes between individuals that still remains to be explained by level-2 predictors (e.g., gender or social relationship factors). The fixed effects indicated that the expected level of depressive symptoms when adolescents were approximately 16 years old (i.e., Time 1) was 35.62 ($p < .001$). Depressive symptoms were not significantly predicted by linear time ($b = .65, p > .05$) but were predicted by quadratic time ($b = -.21, p < .05$). In other words, depressive symptoms did not significantly increase with one unit shifts in age but increases in age does capture the curvature or acceleration in the growth trajectory. Specifically, the quadratic slope suggests that depressive symptoms accelerate in a negative direction. Approximately 10% of the variance in individual depressive symptoms was explained by linear and quadratic time.

Gender conditional model

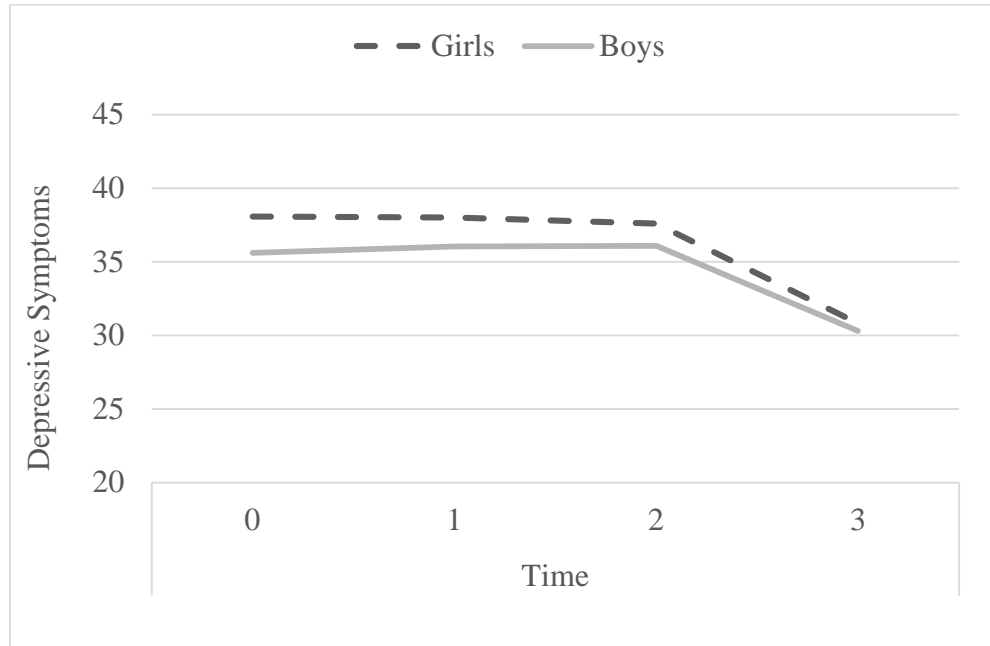
Next, a conditional growth curve model was conducted to explore differences in growth trajectories for girls and boys (see Equation 3). Again, deviance tests were used to determine the best fitting model to the data. Like the unconditional growth model, data suggested that a model with random intercepts ($r_0 = 53.26, p < .001$) and linear slopes ($r_1 = .35, p > .05$) was the best fit the data, compared to a model with only random intercepts ($\chi^2 = 6.71(2), p < .05$) and a model with random intercepts and both linear and quadratic slopes ($\chi^2 = 6.43(3), p > .05$). Examination of the fixed effects indicated that gender was not a significant predictor of depressive symptom intercepts ($b = 2.47, p = .07$), although this effect approached statistical significance. Further, gender was not a significant predictor of the linear slopes ($b = -.56, p > .05$) or quadratic slopes ($b = .04, p > .05$), suggesting gender did not significantly influence the trajectory or change in depressive symptoms over time and across developmental periods. Results from this model are displayed in Table 3 under Model C. A plotted depressive symptom growth trajectory for girls and boys highlighted the similarity in change over time by gender (see Figure 3). Although girls had higher levels of depressive symptoms at all time points, the gap between genders narrowed over time. This model only explained approximately 10% of the variance in individual depressive symptoms.

Table 3 Unconditional Means, Unconditional Growth, and Conditional Growth Curve Models

	Model A: Unconditional Means Model	Model B: Unconditional Growth Model	Model C: Conditional Gender Growth Model
Fixed Effects		<i>b(SE)</i>	
Intercept	35.16***	35.62***	35.61(.68)***
Gender			2.47(1.38) ^t
Linear Slope		.65(.67)	.64(.67)
Gender			-.56(1.38)
Quadratic Time		-.21(.09)*	-.20(.10)*
Gender			.04(.20)
Variance Components		<i>b(SD)</i>	
Level 1			
Within-person residual	74.20(8.61)	67.09(8.19)	67.11(8.19)
Level 2			
Random Intercepts	40.91(6.40)***	54.66(7.39)***	53.26(7.30)***
Random Linear Slopes		.36(.60)	.35(.59)
Deviance	4289.65	4029.44	4025.94

Note. ^t*p* = .07; **p* < .05; ***p* < .01; ****p* < .001

Figure 3 Estimated Growth Trajectory of Depressive Symptoms from the Conditional Gender Model



Full conditional model

Next, a full conditional growth model with gender and social relationship factors as predictors of intercepts and slopes was conducted for the entire sample (see Equation 4). Results of this model are displayed in Table 4 under Model D. Deviance tests suggested that a model with random intercepts ($r_0 = 42.19, p < .01$), random linear slopes ($r_1 = 27.37, p < .05$), and random quadratic slopes ($r_0 = .45, p < .05$) was the best fit to the data ($\chi^2 = 11.59(5), p < .05$). This full conditional model explained approximately 37% of variance in individuals’ depressive symptoms. Examination of the fixed effects suggested that gender predicted differences in depressive symptoms intercepts and interacted with multiple social relationship factors to predict depressive symptoms intercepts and slopes. Therefore, to explore these relationships and

interactions, full conditional models were examined separately for girls and boys (see Model E in Table 5).

Table 4 Full Conditional Growth Curve Model

Fixed Effects	Model D: Full Conditional Growth Model		
	<i>b</i> (<i>SE</i>)		
	Intercept	Linear Slope	Quadratic Slope
Growth Parameter	35.61(.59)***	0.29(.72)	-0.14(.12)
Gender	21.90(10.86)*	-9.51(13.48)	1.05(1.87)
A-M Comm.	0.03(.07)	-0.11(.09)	0.02(.01)
A-F Comm.	-0.09(.06)	0.09(.08)	-0.02(.01) ^t
Peer Support	-0.82(.26)**	0.51(.33) ^t	-0.08(.06)
Sibling Warmth	-0.24(.12)	-0.14(.15)	0.03(.02)
Sibling Hostility	0.28(.12)*	-0.44(.16)**	0.08(.03)**
Sibling Age-gap	0.80(.54)	-0.88(.72)	0.13(.10)
Birth order	-2.91(1.37)*	0.93(1.70)	-0.19(.24)
Sibling Gender	-1.26(1.24)	1.37(1.52)	-0.14(.21)
A-M Comm.* Gender	-0.42(.09)***	0.30(.12)**	-0.04(.02)**
A-M Comm.* Gender	0.01(.07)	-0.06(.09)	0.02(.01)
Peer Support * Gender	0.30(.37)	-0.35(.46)	0.05(.08)
Sibling Warmth *			
Gender	0.39(.16)*	-0.19(.19)	0.01(.03)
Sibling Hostility *			
Gender	-0.23(.16) ^t	0.16(.20)	-0.03(.03)
Variance Components	<i>VC</i> (<i>SD</i>)		
Level 1			
Within-person residual		46.96(6.85)	
Level 2			
Random Intercepts		42.19(6.50)**	
Random Linear Slopes		27.37(5.23)*	
Random Quadratic Slopes		0.45(.67)*	
Deviance	3893.60		

Note. The model included in this table represents results from the full sample.

“**” signifies an interaction.

^t*p* < .10; **p* < .05; ***p* < .01; ****p* < .001.

Table 5 Full Conditional Growth Curve Model by Gender

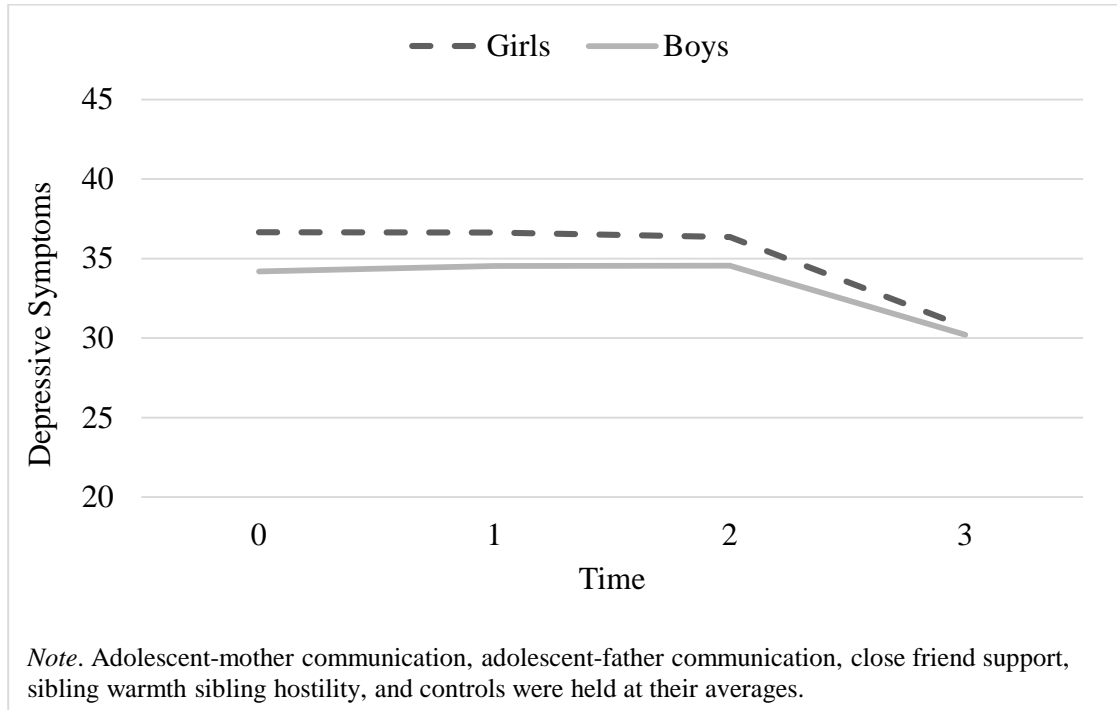
Model E: Full Conditional Growth Model by Gender		
	Girls	Boys
Fixed Effects	<i>b(SE)</i>	
Intercept	36.65(.72)***	34.20(.99)***
A-M Communication	-0.38(.05)***	0.05(.08)
A-F Communication	-0.09(.04)*	-0.10(.07)
Peer Support	-0.51(.24)*	-0.82(.28)**
Sibling Warmth	0.15(.10)	-0.25(.14) ^t
Sibling Hostility	0.05(.09)	0.31(.13)*
Sibling Age-gap	0.44(.64)	1.28(.96)
Birth order	-1.79(1.73)	-4.64(2.23)*
Sibling Gender	-0.56(1.56)	-2.07(1.99)
Linear Slope	0.13(.88)	0.48(1.21)
A-M Communication	0.19(.06)**	-0.13(.09)
A-F Communication	0.03(.05)	0.12(.08)
Peer Support	0.12(.30)	0.57(.35)
Sibling Warmth	-0.36(.12)**	-0.14(.16)
Sibling Hostility	-0.26(.12)*	-0.53(.17)**
Sibling Age-gap	-1.02(.86)	-0.21(1.23)
Birth order	-1.04(2.17)	3.88(2.68)
Sibling Gender	2.10(1.93)	0.70(2.42)
Quadratic Slope	-0.14(.12)	-0.15(.25)
A-M Communication	-0.02(.01)*	0.02(.01) ^t
A-F Communication	-0.00(.01)	-0.02(.01)*
Peer Support	-0.02(.04)	-0.09(.07)
Sibling Warmth	0.05(.02)**	0.03(.02)
Sibling Hostility	0.04(.02)**	0.09(.03)**
Sibling Age-gap	0.14(.12)	0.07(.17)
Birth order	0.07(.30)	-0.54(.39)
Sibling Gender	-0.25(.27)	-0.06(.39)
Variance Components	<i>VC(SD)</i>	
Level 1: Within-person residual	52.04(7.21)	34.30(5.86)
Level 2: Random Intercepts	24.43(4.94)*	71.16(8.44)***
Random Linear Slopes	10.91(3.30)	55.67(7.46)*
Random Quadratic Slopes	.20(.45) ^t	.92(0.96)**
Deviance	2315.30	1563.29

Note .^t*p* < .10; **p* < .05; ***p* < .01; ****p* < .001.

Full conditional model by gender

A full conditional model with all social relationship factors and controls was conducted separately for girls and boys. Results from this model are displayed in Table 5 under Model E. An estimation plot was used to examine expected depressive symptom trajectories from adolescence to emerging adulthood for the average girl and boy. In other words, this plot illustrated the expected trajectory of depressive symptoms for girls and boys with average levels of adolescent-parent communication, close friend support, sibling warmth, sibling hostility, and control variables. Generally, this plot suggested that girls and boys had similar trajectories throughout adolescence and into emerging adulthood (see Figure 4). Although girls had higher levels of depressive symptoms at all time points, the gap between genders narrowed with age, such that girls and boys had similar levels in emerging adulthood. Relative to the gender conditional model (see Model C in Table 3 and Figure 3), both girls and boys with average levels of social relationship factors and sibling controls had lower initial levels of depressive symptoms and less steep declines in depressive symptoms into emerging adulthood.

Figure 4 Estimated Depressive Symptom Trajectories for the Average Girl and Boy

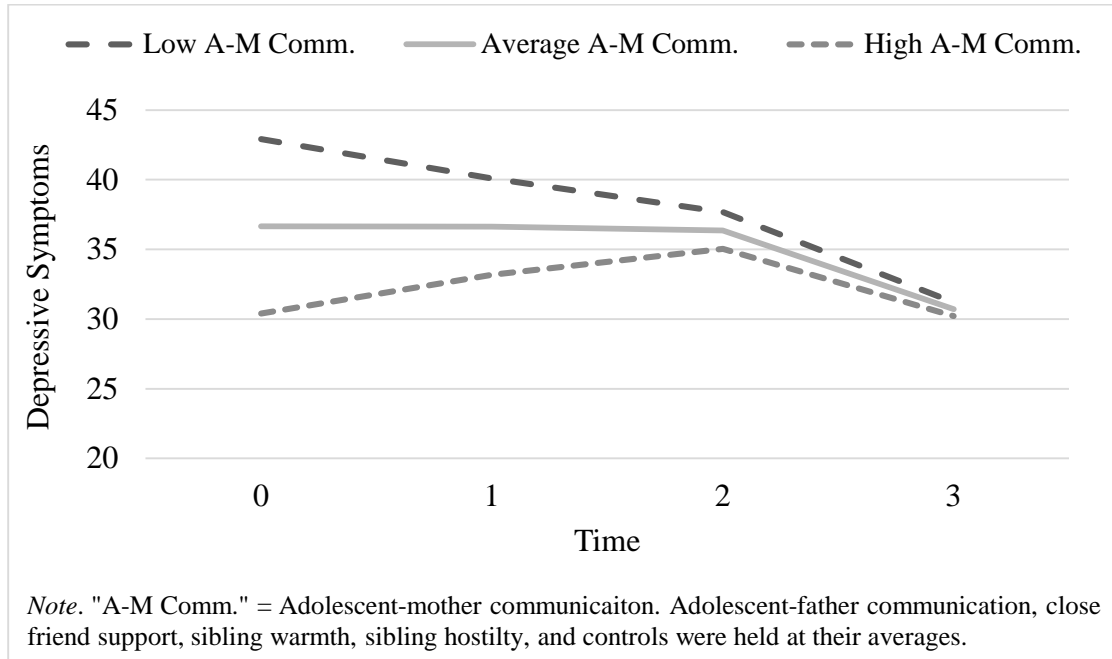


Girls

The predicted depressive symptoms score for the average girl at 16 years old was 36.65 ($p < .001$). Adolescent-mother communication ($b = -.38, p < .001$), adolescent-father communication ($b = -.09, p < .05$), and peer support ($b = -.51, p < .05$) negatively predicted depressive symptoms at Time 1 for girls (see Table 5). In other words, girls with more open and less problematic communication with their parents and more support from their peers had lower levels of initial depressive symptoms. The sibling relationship characteristics and the sibling control variables did not predict depressive symptoms intercepts.

Both linear and quadratic depressive symptom slopes were predicted by adolescent-mother communication, sibling warmth, and sibling hostility, although in different directions. Adolescent-mother communication was a positive predictor of the linear slopes ($b = .19, p < .01$) and negative predictor of the quadratic slope ($b = -.02, p < .05$). To explore this effect, depressive symptom trajectories for girls with low (-1 standard deviation [SD]), average, and high (+1 SD) levels of adolescent-mother communication were estimated, holding all other model variables at their averages (see Figure 5). This plot highlights the downward curvature of depressive symptoms into emerging adulthood for those with low, average, and high levels of adolescent-mother communication. Further, this plot suggests that the greatest difference in depressive symptoms between those with low (i.e., less open and more problematic communication) and high (i.e., more open and less problematic communication) levels of adolescent-mother communication was at age 16. However, over time, these two trajectories converged in emerging adulthood.

Figure 5 Estimated Depressive Symptom Trajectories for Girls' with Low, Average, and High Levels of Adolescent-Mother Communication



Results also suggested that both sibling warmth and sibling hostility were negative predictors of girls' linear slopes ($b = -.36, p < .01$; $b = -.26, p < .05$, respectively) and positive predictors of quadratic slopes ($b = .05, p < .01$; $b = .04, p < .01$, respectively). To examine this effect, trajectories for girls with low (-1 SD), average, and high (+1 SD) levels of sibling warmth (see Figure 6) and sibling hostility (see Figure 7) were estimated, holding all other model variables at their averages. Plots suggested similar patterns for both sibling relationship characteristics. Specifically, low levels of sibling warmth and low levels of sibling hostility predicted girls' gradual increases in depressive symptoms throughout adolescence and steep declines into emerging adulthood. Conversely, trajectories for those with high levels

of sibling warmth and high levels of sibling hostility predicted more gradual declines in depressive symptoms across developmental periods for girls.

Figure 6 Estimated Depressive Symptom Trajectories for Girls' with Low, Average, and High Levels of Sibling Warmth

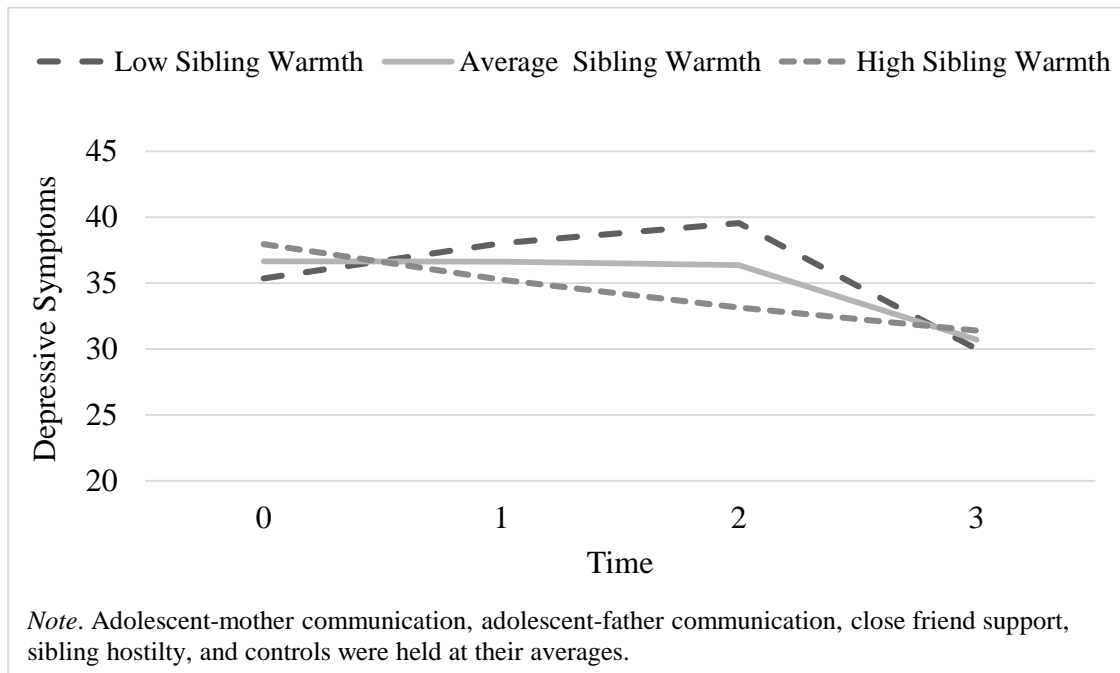
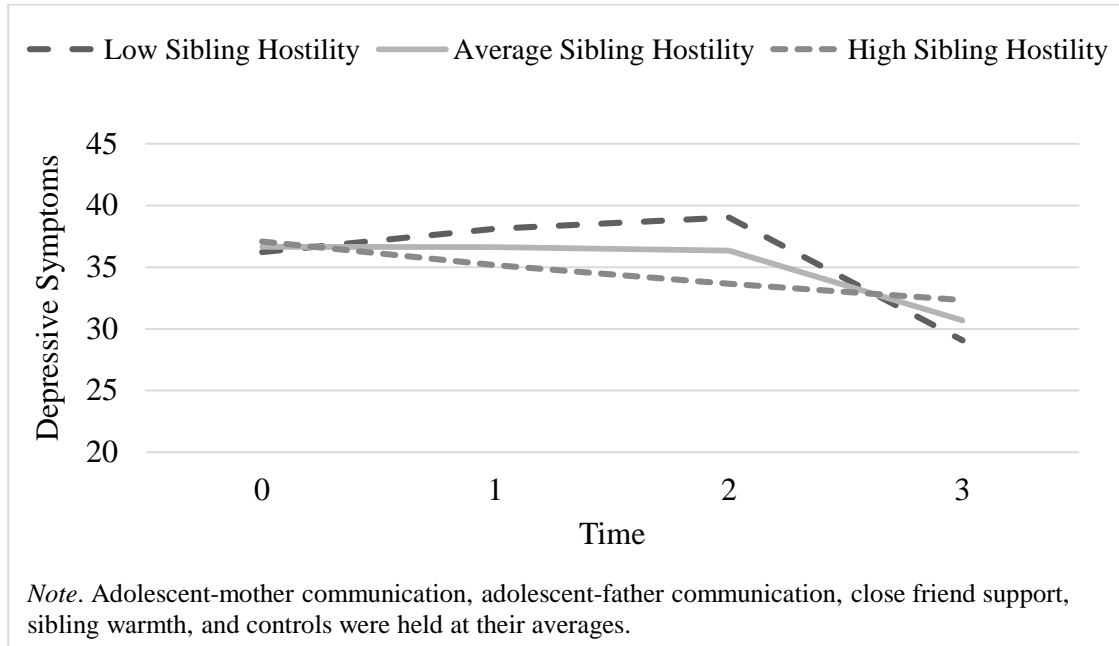


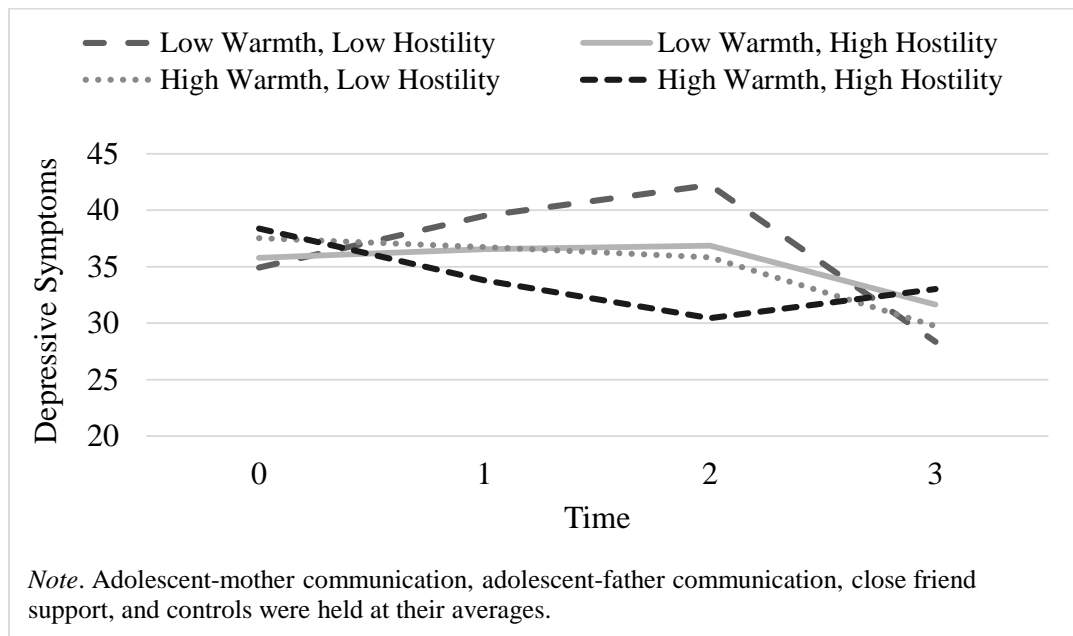
Figure 7 Estimated Depressive Symptom Trajectories for Girls' with Low, Average, and High Levels of Sibling Hostility



Given that sibling warmth and hostility predicted girls' depressive symptom trajectories in the same direction and research suggests that sibling relationships are characterized by simultaneous warmth and conflict (Brody, 2004), it is possible that these relationship characteristics work together to influence depressive symptoms. Therefore, an additional plot was estimated which modeled depressive symptom trajectories for four combinations of warmth and hostility: 1) low warmth and low hostility, 2) low warmth and high hostility, 3) high warmth and high hostility, and 4) high warmth and high hostility (see Figure 8). As in previous plots, all other model variables were held at their averages. This plot demonstrated that girls who experienced low levels of warmth and hostility had both the greatest increases in depressive symptoms throughout adolescence and the greatest declines into emerging

adulthood. Those with low warmth and high hostility and high warmth and low hostility showed similar and relatively flat trajectories of depressive symptoms throughout adolescence and declines into emerging adulthood. Finally, those with high warmth and high hostility showed relatively steep declines in depressive symptoms throughout adolescence and modest increases in emerging adulthood. Adolescent-father communication, peer support, and the sibling control variables did not predict trajectories of depressive symptoms into emerging adulthood for girls.

Figure 8 Estimated Depressive Symptom Trajectories for Girls' with Varying Levels of Sibling Warmth and Sibling Hostility

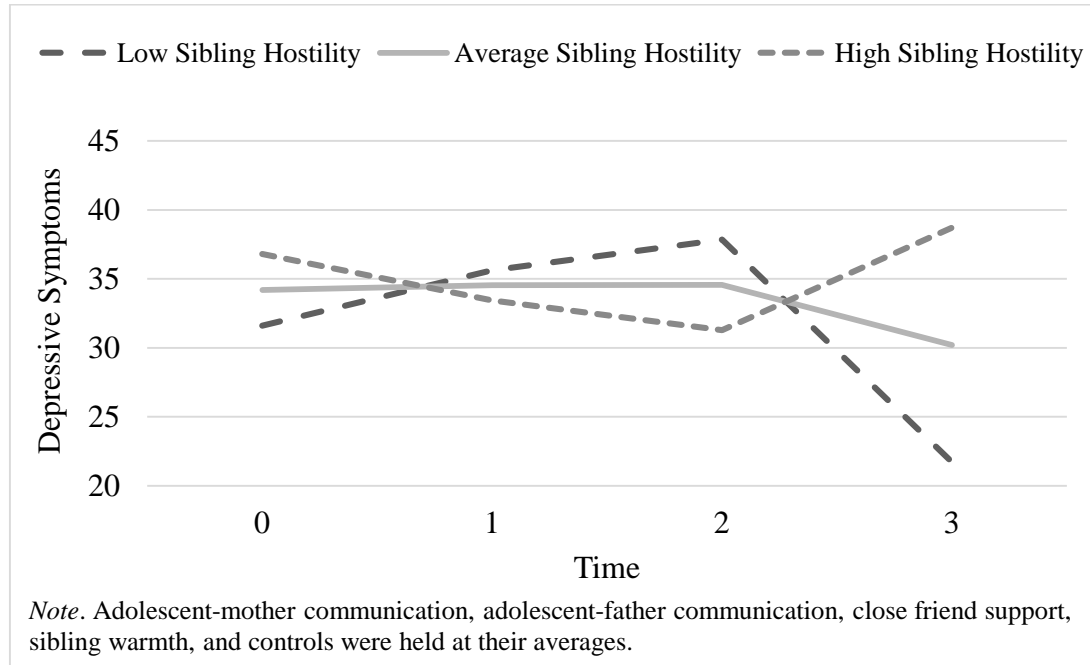


Boys

The predicted depressive symptoms score for the average boy at 16 years old was 34.20 ($p < .001$). Findings suggested that boys with higher levels of peers support had lower levels of initial depression ($b = -.82, p < .01$). Conversely, boys who perceived greater hostility from their sibling had higher levels of depressive symptoms at the start of the study ($b = .31, p < .05$). Further, adolescents with an older sibling had higher initial levels of depressive symptoms ($b = -4.64, p < .05$). The adolescent-parent communication variables, sibling warmth, and the remaining controls did not predict depressive symptoms intercepts.

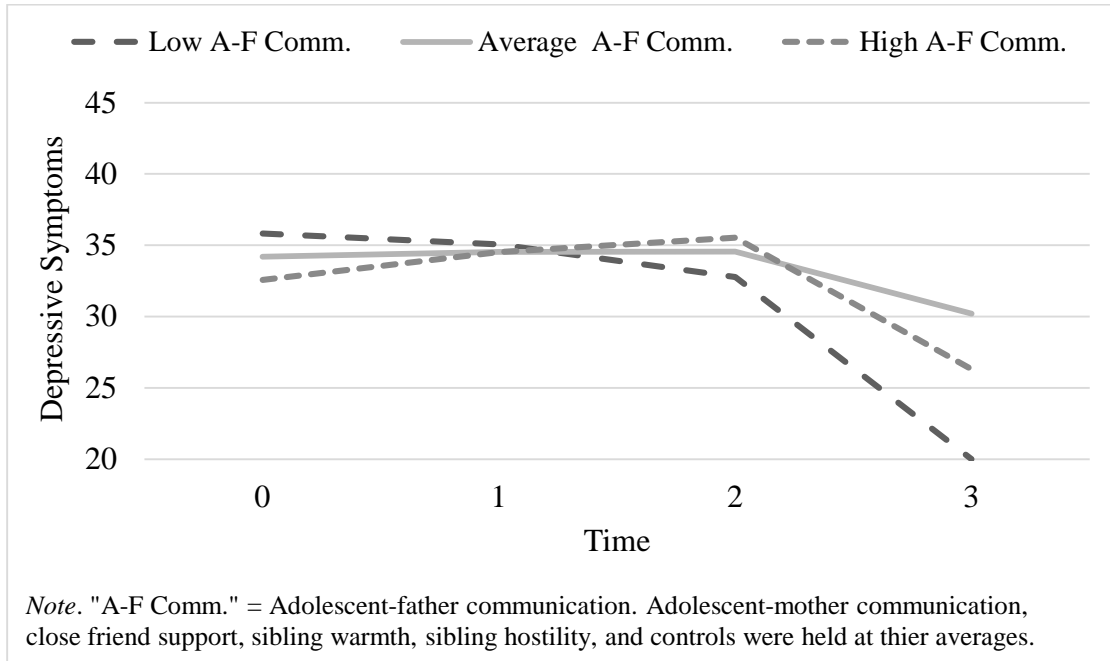
Like for girls, linear and quadratic changes in depressive symptoms over time were predicted by sibling hostility. Sibling hostility was a negative predictor of the linear slope ($b = -.53, p < .01$) and a positive predictor of the quadratic slope ($b = .09, p < .01$). Trajectories for boys with low (-1 SD), average, and high (+1 SD) levels of sibling hostility were estimated, holding all other model variables at their averages (see Figure 9). This plot suggests that boys' with low levels of sibling hostility showed increases in depressive symptoms over time and sharp declines into emerging adulthood. Conversely, although boys with high levels of sibling hostility initially had the highest levels of depressive symptoms, over time, depressive symptoms declined through adolescence and increased into emerging adulthood.

Figure 9 Estimated Depressive Symptom Trajectories for Boys' with Low, Average, and High Levels of Sibling Hostility



Lastly, adolescent-father communication was found to be a significant negative predictor of the quadratic slope ($b = -.02, p < .05$). To explore this effect, trajectories for boys with low (-1 SD), average, and high (+1 SD) levels of adolescent-father communication were estimated, holding all other model variables at their averages (see Figure 10). This plot highlighted the downward curvature of depressive symptoms into emerging adulthood for those with all three levels of adolescent-father communication. The other social relationship factors and sibling control variables were not significant predictors of depressive symptoms slopes for boys.

Figure 10 Estimated Depressive Symptom Trajectories for Boys' with Low, Average, and High Levels of Adolescent-Father Communication



Chapter 5

DISCUSSION

The literature on depressive symptoms suggests it is a psychological disorder that is particularly prevalent among adolescents and young adults (SAMHSA, 2014). Further, evidence suggests that this disorder differentially affects females (Nolen-Hoeksema, 2001; Wesselhoeft et al., 2013) and is related to experiences in familial and extrafamilial relationships (Harper et al., 2014). However, extant research often is limited by cross-sectional samples, within developmental period examinations, and/or ignores important social influences (e.g., Kim et al., 2007; van Lang et al., 2006). Therefore, the purpose of the current study was twofold. First, this study aimed to explore the trajectories of depressive symptoms from adolescence to emerging adulthood by gender. Second, this study simultaneously examined how social relationship factors with parents, peers, and siblings influenced depressive symptoms trajectories for girls and boys.

Following the recommendations outlined by Singer and Willett (2003), multiple steps were taken prior to addressing the study aims of modeling and predicting trajectories of depressive symptoms across developmental periods. These preliminary analyses indicated that there was considerable variability in depressive symptoms within and between individuals on their levels of depressive symptoms. Further, results suggested there was significant variability in depressive symptom trajectories over time which could possibly be explained by both individual and social relationship factors.

Based on these findings, a conditional growth curve model was conducted to examine differences in depressive symptom trajectories by gender. Contrary to hypotheses, in this initial model, results suggested that alone, gender was not a significant predictor of depressive symptom intercepts or slopes. In other words, depressive symptoms in adolescence and the changes that occur over time into emerging adulthood were similar for girls and boys. A wealth of past studies have shown that girls have both greater levels of depressive symptoms in adolescence (Thapar et al., 2012) and gender plays a role in understanding how depressive symptoms change over time (Angold et al., 2002; Meadows et al., 2006). However, it should be noted that not all studies find differences in experiences with depressive symptoms between girls and boys (see Wesselhoeft et al., 2013 for a review). Further, similar to the current study (discussed below), research often shows that the differences in girls and boys experiences with depression are confounded by other factors. For example, research has shown that girls and boys depressive symptom trajectories differ as a function of their relationships with siblings (e.g., Kim et al., 2007). As such, perhaps this simplistic conditional growth curve model does not fully capture the complexity of the gender differences in depressive symptom trajectories.

The second and primary aim of the current study was to explore how elements of social relationship factors with parents, peers, and siblings simultaneously predict trajectories of depressive symptoms from adolescence to emerging adulthood for girls and boys. Overall, results suggested that both gender and various social relationship factors predicted initial levels of depressive symptoms in adolescence as well as change in depressive symptoms over time. Further, findings indicated significant two-way interactions between gender and multiple social relationship factors and three-

way interactions among gender, social relationship factors, and time. To help explore these relationships and draw meaningful conclusions, separate models were conducted for girls and boys. Generally, results from models conducted separately by gender suggested that girls and boys with average levels of social relationship factors and sibling controls had similar depressive symptom trajectories across developmental periods. Specifically, depressive symptoms were relatively stable throughout adolescence and showed declines into emerging adulthood. Further, although girls' depressive symptoms were higher at all time points in the study, the gap between girls and boys narrowed over time. This is in line with previous research which has shown that depressive symptoms tend to decrease in emerging adulthood (Galambos & Krahn, 2008) and that girls and boys levels of depressive symptoms become more similar with age (Meadows et al., 2006).

Parents

Results from the current study suggested that adolescent-parent communication differentially predicted initial levels of depressive symptoms for girls and boys. For girls, communication between daughters and both mothers and fathers was negatively related to initial levels of depressive symptoms during adolescence. In other words more open and less problematic communication with mothers and fathers was related to lower levels of depressive symptoms at the start of the study for girls. These findings are in line with past research that suggests close relationships with parents during adolescence are related to a range of adjustment outcomes (Brown & Bakken, 2011; Smetana et al., 2006), including depressive symptoms (Yu et al., 2006). However, adolescent-parent communication with mothers or fathers did not predict boys initial levels of depressive symptoms. Although this was contrary to hypotheses

for boys, the developmental changes that occur during adolescence may explain current study findings. Research and theory suggests that throughout adolescence and emerging adulthood parents play an important role in boys' lives (Heath, 2009; Arnett, 2016b). However, studies also have shown that, compared to girls, boys rely less on intimacy in relationships and are less socially expressive (Ruble, Martin, & Berenbaum, 2006). Further, research has shown that boys are less likely than girls to self-disclose information about emotional topics or concerns (Papini & Farmer, 1990) and that societal or macro-level influences socialize children and adolescent girls and boys to interact with others differently (Ruble et al., 2006). Therefore, it is possible that communication with mothers and fathers does not influence boys' depressive symptoms in the same way it does girls. Alternatively, perhaps other aspects of adolescent-parent communication may be important for understanding boys' depressive symptoms. The current study explored total levels of open and problematic communication between adolescents and their parents. However, research has suggested that girls and boys differ on a variety of communication elements, such as frequency of communication or discussions about problems in relationships with others (Cernkovich & Giordano, 1987). Future research should explore associations among other elements of boys' adolescent-parent communication and depressive symptoms to better understand this association.

Findings also suggested that adolescent-parent communication influenced changes in depressive symptom trajectories differently for girls and boys. For girls, adolescent-mother communication, but not adolescent-father communication, predicted change in depressive symptoms. Specifically, findings suggested that adolescent-mother communication positively predicted linear change and negatively

predicted quadratic change in depressive symptoms over time. Taken together, these findings suggested that more open and less problematic communication between adolescent girls and their mothers predicted the overall downward curvature or decline of depressive symptoms from adolescence into emerging adulthood. As shown by estimation plots, despite vast differences during adolescence, trajectories of depressive symptoms became more similar over time for girls among both positive and negative communication styles with mothers. For boys, however, only adolescent-father communication predicted change in depressive symptoms over time. Similarly, more open and less problematic communication between boys and their fathers predicted the negative acceleration or decline in depressive symptoms into emerging adulthood. Exploring this relationship through estimation plots revealed that boys showed similar levels of depressive symptoms in adolescence, across positive and negative communication styles with fathers. However, in emerging adulthood, boys who reported less open and more problematic communication with their father had the lowest levels of depressive symptoms in emerging adulthood. Perhaps this decline is associated with the positive impact that distance and autonomy have been shown to have on the emerging adult-parent relationship (Seiffge-Krenke, 2016).

Taken together, findings for both girls and boys are in line with past research which has shown that communication is an important element of the adolescent-parent relationship to consider when examining longitudinal associations with depression. For example, Allen et al. (2006) found that adolescents with high relationship quality (i.e., good communication and trust in the relationship) reported low levels of concurrent and future depression. Similarly, these findings are supported by a family systems perspective which emphasizes the central role parents play in organizing and

maintaining the family system (Cox & Paley, 1997). Further, the observed differences in the association between communication and depressive symptoms based on the gender composition of the adolescent-parent dyad are consistent with past literature. Studies have shown that communication with mothers is particularly important for girls' depressive symptoms in adverse family contexts (Ohannessian, 2012). Similarly, relationship quality with fathers, but not mothers, has been shown to predict later depression for boys (Harper et al., 2014). These gendered findings also are in line with research that suggests girls and boys tend to emulate same-sex models (Bussey & Bandura, 1984), particularly in the context of close relationships (Gaunt & Bassi, 2012). Based on this literature, perhaps same-sex parent models are more influential sources of support for depressive symptoms.

Peers

Peers also were found to play an important role in predicting elements of depressive symptom trajectories. Specifically, results suggested that support from a close friend was negatively related to initial levels of depressive symptoms during adolescence for both girls and boys. This finding supports past research that suggests social support from peers is protective from depressive symptoms in adolescence (Burton et al., 2004; Nilsen et al., 2013), especially for girls (Rose & Rudolph, 2006). In addition, this finding is in line with bioecological systems theory which emphasizes the importance of microsystem relationships, or relationships in immediate contexts that have the most direct impact on individual's development (Bronfenbrenner & Morris, 2006). However, research also has indicated that peers are salient sources of support and guidance throughout adolescence and emerging adulthood (Barry et al., 2016; Chu, 2005). Yet, in the current study, social support from peers did not predict

depressive symptoms trajectories into emerging adulthood for either gender. In other words, the effects of social support from a close friend in adolescence did not have a lasting or long-term impact on changes in individuals' depressive symptoms over time. Although research suggests that peers are particularly prominent sources of influence in individuals' lives (Berndt, 2002; Brown & Bakken, 2011), the nature of the adolescent-peer relationship may explain why close friend support in adolescence does not influence depressive symptoms trajectories across developmental periods. Unlike family relationships which tend to be long-lasting and stable (Bengtson, 2001; Cox & Paley, 1997), peers may be more transient sources of influence and may therefore be less influential long term. Research and theory on adolescent-peer relationships suggests that as individuals explore their identity and move through adolescence, friendships fluctuate and dissipate (Bowker, 2011; Brown, 1990). With the number of transitions and changes that occur within adolescence, it is conceivable that friendships may frequently change over time, therefore reducing the strength of their positive effect on adjustment outcomes.

Siblings

Lastly, results from the current study suggested that relationships with siblings played a significant role in predicting depressive symptoms trajectories for both genders, although in partially dissimilar ways. Contrary to study hypotheses, sibling warmth and hostility did not predict girls' initial level of depressive symptoms in adolescence. This finding is surprising given that research suggests girls report greater intimacy, affection, and care (Cole & Kerns, 2001) and less hostility (Feinberg et al., 2012) in relationships with siblings than boys. Further, studies show that girls are more reactive to interpersonal stress than boys (e.g., in stress within family

relationships) and this stress is related to experiences with depression (Shih et al., 2006). However, sibling hostility, but not sibling warmth, was found to be a significant predictor of boys' initial levels of depressive symptoms. Specifically, greater levels of hostility between boys and their sibling was related to higher levels of depressive symptoms at the start of the study. Given that research suggests that sibling dyads that contain boys are more likely to experience conflict and report lower levels of intimacy than girls (Cole & Kerns, 2001; Feinberg et al., 2012), it may be that boys are therefore more susceptible to the influence of conflict, rather than warmth, as it particularly prevalent in their sibling experience.

Boys' initial levels of depressive symptoms were also predicted by the birth order control variable. Specifically, boys with an older sibling had higher initial levels of depressive symptoms. This finding may be explained in light of research which suggests that younger siblings are susceptible to the influence of their older sibling counterpart (e.g., Samek et al., 2015; Windle, 2000). For example, research has shown that support from an older sibling was negatively related to depressive symptoms and positively related with school success. Importantly, this association only occurred when younger siblings had a positive image of their older sibling. Therefore, perhaps the relationship between birth order and depressive symptoms in the current study was driven by underlying perceptions adolescents' had of their older sibling or levels of support within the sibling dyad. Future research should explore potential sibling relationship elements in the context of various sibling structural characteristics to further understand these effects.

Results also suggested that sibling relationship factors predicted changes in depressive symptoms over time differently by gender. For boys, only sibling hostility

predicted depressive symptom slopes. Estimation plots were used to explore how different levels of sibling hostility predicted depressive symptom trajectories over time. For boys with low levels of sibling hostility, depressive symptoms gradually increased throughout adolescence and then sharply declined into emerging adulthood. Conversely, for boys with high levels of sibling hostility, depressive symptoms gradually declined throughout adolescence and then sharply increased into emerging adulthood. Results for those with high levels of hostility in the sibling dyad support past research which has shown positive longitudinal associations between sibling hostility or conflict and depressive symptoms for both girls and boys (Harper et al., 2014; Padilla-Walker et al., 2010; Stocker et al., 2002).

For girls, exploration of estimation plots suggested that, independently, level of warmth and hostility within the sibling relationship predicted different depressive symptom trajectories. Specifically, girls with low levels of warmth and low levels of hostility showed slight increases in depressive symptoms throughout adolescence and then sharp declines into emerging adulthood. Alternatively, girls with high levels of warmth and hostility showed gradual declines in depressive symptoms over time. Overall, these findings suggest that sibling warmth and sibling hostility are influencing depressive symptoms in similar ways across developmental periods. This is not surprising given research suggests that sibling relationships are characterized by simultaneous warmth and conflict (Brody, 2004) and that warmth and hostility between siblings have both a unique and a shared influence on a range of adjustment outcomes (Brody, 1988). Therefore, it is possible that because adolescents' experiences with warmth often coexist with hostility, these effects may be tied together. To explore this connection, depressive symptom trajectories for those with

varying levels of warmth and conflict were examined in this study. Generally, findings suggested girls who reported having minimal positive or negative sibling interactions (i.e., low levels of warmth and low levels of hostility) and volatile sibling interactions (i.e., high levels of warmth and high levels of hostility) were estimated to have the greatest changes in depressive symptoms from adolescence and emerging adulthood. These results draw attention to the importance of simultaneously considering multiple sibling relationship characteristics.

Taken together, results from this study support bioecological and family systems perspectives which highlight siblings as important members of individuals' immediate contexts (Bronfenbrenner & Morris, 2006; Cox & Paley, 1993). Further, these findings strengthen the limited body of research on sibling relationship experiences and depressive symptoms. Although some research has not observed longitudinal associations between sibling affection and depressive symptoms girls or boys (e.g., Harper et al., 2014), other research has found an inverse relationship. For example, Kim and colleagues (2007) observed a negative relationship between changes in sibling intimacy and changes in depressive symptoms over time for girls. However, it should be noted that Kim et al. explored sibling intimacy as a time-varying covariate (i.e., covariate measured and assessed at each wave of the study; Singer & Willett, 2003). In other words, these authors were able to examine the changing association between sibling intimacy and depressive symptoms from one point to the next. Therefore, perhaps the current study's exploration of sibling warmth at a single time point, or as a time-invariant predictor, may explain why the inverse relationship between sibling warmth and depressive symptoms was not observed for those with high levels of warmth. Given the relatively limited research exploring

multiple sibling relationships characteristics and the simultaneous influence of parents, peers, and siblings, future work is needed to develop the understanding how social relationships influence depressive symptom trajectories from adolescence to emerging adulthood.

Limitations

Although this study makes important contributions to the depressive symptoms literature, it has several limitations. First, the current study solely examined adolescents who reported having one sibling during the first time of measurement. As families become increasingly complex with divorce, remarriage, and multiple-partner fertility (Cherlin, 2010), research that accounts for changing and diverse family structures is warranted. Although some work has begun to explore more diverse family arrangements (e.g., Padilla-Walker et al., 2010), more research is needed. For example, it may be fruitful to explore the current study relationships in families with multiple sibling dyads or families with step-siblings. Relatedly, future studies should explore associations among the various structural characteristics of sibling dyads, relationship characteristics, and depressive symptoms. It is possible that relationships between sibling hostility and depressive symptoms may vary depending on the gender of the older or younger sibling, for example. A more complete examination of the various sibling structural characteristics is needed to develop the understanding of how siblings influence depressive symptom trajectories.

Second, this current study is limited in that it does not explore the potentially interacting family subsystems. Family systems theory suggests that the multiple family subsystems are constantly interacting and influencing one another (Cox & Paley, 2003). Therefore, it is possible that sibling and parent relationship factors work

together to influence adolescent depressive symptoms. As such, future research should explore how parent and sibling relationship factors interact to predict depressive symptom trajectories over time. Third, the current study was limited because of the treatment of the social relationship factors as time-invariant. It is possible and likely (e.g., Kim et al., 2007) that in addition to depressive symptoms, parent, peer, and sibling relationship factors change over time. Future research should explore these relationship factors as time-varying covariates to see how they change over time and explore their influence on the trajectories of depressive symptoms from adolescence to emerging adulthood. Relatedly, studies should attempt to examine the causal mechanisms driving associations between social relationship factors and depressive symptoms for girls and boys. For example, it is conceivable that hostility from a sibling can cause adolescents to experience depressive symptoms *and* that experiences with depression symptoms can result in hostility from a sibling. In the future, studies should attempt to tease apart these relationships to understand underlying causal mechanisms (e.g., with cross-lagged panel models). Fourth, this study is limited in that there may be other factors that are important for understanding adolescent and emerging adult depressive symptoms. For example, studies suggest that childhood adversity (Gladstone & Beardslee, 2009), poverty (Najman et al., 2010), and race and ethnicity (Nilsen et al., 2013) are related to individuals experiences with depression. Similarly, studies suggest that depressive symptoms may be comorbid with anxiety (van Lang, et al., 2006). Future research should attempt to explore these factors, as well as others, in combination with social relationship experiences. Finally, this study is limited as it relies on self-report data from adolescents. Utilization of multiple methods of data collection, such as observational techniques or in depth interviews,

may result in greater insights into how relationships with parents, peers, and siblings influence depressive symptom trajectories.

Conclusion

Despite the aforementioned limitations, the current study provides several important contributions to the literature examining associations between social relationship factors and trajectories of depressive symptoms for girls and boys. Results from this study suggest that adolescent-parent communication, peer support, and sibling warmth and hostility play significant and unique roles in understanding the diverse trajectories of depressive symptoms from adolescence to emerging adulthood. Notably, findings highlighted how these relationship factors differentially influenced depressive symptoms trajectories for girls and boys. This study extended past literature by using a longitudinal design which allowed for the exploration of the simultaneous influence of multiple important social forces on depressive symptoms across developmental periods.

Given that depression is a particularly prevalent adjustment disorder among adolescents and emerging adults, understanding the factors that influence this outcome has implications for individuals interested in supporting youth and their families experiencing depressive symptoms through prevention and intervention programs. For example, given that results from this study suggest that both familial and extrafamilial relationships influence experiences with depressive symptoms, perhaps programs should consider including both groups in treatment plans. Relatedly, based on these findings, prevention programs may find it advantageous to strengthen and promote positive relationships with the parents, peers, and siblings in adolescents' lives as these relationships are influential in understanding trajectories of depression

into later developmental stages. Finally, given that results from this study emphasize the unique experiences of girls and boys, it may be beneficial for programs to tailor efforts to meet the specific needs of girls and boys.

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Appendix

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DATE: February 3, 2016

TO: Laura Finan
FROM: University of Delaware IRB

STUDY TITLE: [862629-1] PARENT, PEER, AND SIBLING RELATIONSHIP FACTORS AND DEPRESSION IN ADOLESCENCE AND EMERGING ADULTHOOD: A GROWTH CURVE ANALYSIS

SUBMISSION TYPE: New Project

ACTION: DETERMINATION OF EXEMPT STATUS
DECISION DATE: February 3, 2016

REVIEW CATEGORY: Exemption category # (4)

Thank you for your submission of New Project materials for this research study. The University of Delaware IRB has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

We will put a copy of this correspondence on file in our office. Please remember to notify us if you make any substantial changes to the project.

If you have any questions, please contact Nicole Farnese-McFarlane at (302) 831-1119 or nicolefm@udel.edu. Please include your study title and reference number in all correspondence with this office.