

DEVELOPMENTAL CHANGES IN SOCIAL NEEDS ACROSS ADOLESCENCE:
EXAMINING ASSOCIATIONS BETWEEN SOCIAL RELATIONSHIPS AND
LONELINESS

by

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Developmental Changes in Social Needs Across Adolescence: Examining Associations
Between Social Relationships and Loneliness

A Thesis submitted in partial fulfillment of the requirements for the degree of Master of
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ABSTRACT

DEVELOPMENTAL CHANGES IN SOCIAL NEEDS ACROSS ADOLESCENCE: EXAMINING ASSOCIATIONS BETWEEN SOCIAL RELATIONSHIPS AND LONELINESS

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During adolescence, transformations in social relationships and needs have implications for loneliness. Developmental view on the adolescent social relationships and Qualter et al's (2015) life-span model of loneliness suggest that changes in self-awareness, desire to be liked by peers, and capacity for intimacy are associated with age-related differences in sources of loneliness. Early adolescents may report increased loneliness when they do not receive support from parents, lack a close friendship, and are not accepted into cliques or peer groups. For middle adolescents, their most proximal sources of loneliness stem from lacking an intimate friendship and not dating or having a romantic partner. To examine the age differences in the importance of different social relationships (parents, peers, and romantic partners) for adolescent loneliness, we used data from 714 middle and high schoolers (51% female, Mean age 13.73, 28% white, 7% African American, 50.8% Hispanic/Latino, 1.3% Asian, and 2% American Indian). Results indicated that family

and friend support were negatively associated with loneliness for all youth. As expected, family support was more beneficial in reducing loneliness among 6th graders than 9th graders; no age differences were documented for the associations between friendships and loneliness. These findings provide partial support for the tenets of the life-span model of loneliness and have implications for clinical practice, school settings, and developmental research. To more comprehensively understand loneliness in adolescence, future research should measure quality of adolescent romantic relationships and permission to engage in dating. Furthermore, future research should employ social network analyses to examine how quality and density of peers and peer networks are related to loneliness.

CHAPTER ONE

Feeling lonely is an experience shared by all people, and time spent alone can be constructive and meaningful. When loneliness is experienced in a temporary fashion, it does not have detrimental impacts on physical or mental health; however, when loneliness becomes chronic, mental and physical health can suffer. For adolescents, in particular, loneliness is a prominent concern for adaptive functioning, mental and physical health. In fact, around 80% of teenagers report feeling lonely sometimes (Hawkley & Cacioppo, 2010), more than 50% of adolescents experience recurrent loneliness, and 20% of adolescents are plagued by chronic loneliness that is debilitating (Heinrich & Gullone, 2006). As children transition into adolescence, their needs and capacities for social relationships increase in complexity. While young children meet social needs by being physically close to their playmates and sharing activities with them, adolescents begin to seek greater depth in their social relationships (Qualter et al., 2015). In a time when social needs are evolving, it is essential to understand the implications of social relationships for loneliness in various stages of adolescence to advance developmental theory and inform intervention and prevention efforts.

According to reviews from the literature on loneliness throughout the lifespan, loneliness has a cyclic nature; lonely individuals, including adolescents, are more likely

to withdrawal socially, have poorer quality of social interactions, have more caution and distrust towards others, and feel more negatively during social interactions (Heinrich & Gullone, 2006). These interpersonal consequences of loneliness may guarantee further perpetuation of loneliness. For example, adolescents may be less likely to seek out social experiences if they find their relationships to be of poor quality or their interactions to be negative (Hawkley & Cacioppo, 2010). Subsequently, when loneliness prompts caution and mistrust of others, individuals may perceive threat amid interactions with others, and be more likely to continue a pattern of withdrawal and social distance (Qualter et al., 2015). This “loneliness loop” contributes to chronic loneliness that has detrimental effects on functioning and health later on in life. Robust evidence indicates that loneliness is associated with mental and physical health risks including a 26% increase in mortality (Holt-Lunstad, Smith, Baker, Harris, & Stephenson, 2015).

Because adolescence is the time in development when loneliness is most frequent (Hawkley & Cacioppo, 2010), it is important to understand its psychosocial origins. Because of substantial transformation in social relationships during adolescence (Smetana, Campione-Barr, & Metzger, 2006), the different sources and impacts of loneliness need to be considered for younger and older adolescents. Much of the research on social relationships and loneliness in adolescence does not consider the developmental differences across adolescence that impact these constructs. Current research has demonstrated shifts from playmates in childhood to parental relationships, close friends, and romantic relationships in adolescence (Crosnoe, 2000); however, prior research often fails to address how 6th graders’ needs differ from 9th graders’, and instead, examines and

interprets social needs and loneliness as if they are the same across adolescence. This oversight is potentially problematic as it inaccurately represents early and middle adolescent social needs and sources of loneliness, and thus, incorrectly informs intervention and prevention efforts aimed at reducing loneliness in this population.

Qualter et al's (2015) Life-span Model of Loneliness

Developmental theory suggests that there are shifts in the composition and functionality of friendships and other social relationships from childhood to adolescence (Bagwell & Schmidt, 2013; McFarland, Moody, Diehl, Smith, & Reuben, 2014), but changes in social relationship needs and sources of loneliness across adolescence is less well understood. Qualter et al's (2015) life-span model of loneliness posits that from 6th to 9th grade, teenagers develop differential social desires and needs. Specifically, 6th graders are expected to acquire most of their social fulfillment from their parents, close friends, and belonging to groups or cliques, whereas 9th graders are assumed to derive the majority of their social fulfillment from close friends and romantic partners. For these reasons, Qualter and colleagues theorized that sources of loneliness would be different for 6th and 9th graders. Thus, the current study provides an empirical test of these ideas and fills the gap in research by considering a comprehensive look at adolescent social relationships across multiple systems (peers, parents, school) by examining differential needs in social relationships and subsequent impacts on loneliness in two stages of adolescence: early and middle. Through examination of social relationship and loneliness differences between 6th and 9th graders, the current study will contribute to the field's understanding

of the role that developmental differences, social relationships, and social needs play in predicting loneliness at different developmental stages.

Loneliness: Definition, Consequences, and Antecedents

Being socially isolated and being lonely can often be interpreted as the same construct; however, loneliness differs from social isolation in that loneliness is experienced when there is a discrepancy between desired social connection or fulfillment and actual social connection or fulfillment (Cacioppo, Grippo, London, Goossens, & Cacioppo, 2015). Social isolation occurs when an individual experiences absence of social interactions, contacts, or personal or communal relationships (Berg & Cassells, 1992). Transient feelings of loneliness have been conceptualized as signals to renew and restore social connections (Cacioppo, Fowler, Christakis, & 2009). Social relationships alleviate loneliness when they allow for shared intimacy, emotional and instrumental support, and belonging.

Chronic loneliness has substantial consequences for acute and long-term physical health. Lonely people suffer more somatic symptoms like headaches, fatigue, illness, lowered immunity to illness, poor sleep quality, and poor cardiovascular functioning than do non-lonely people (Heinrich & Gullone, 2006). For adolescents, specifically, research indicates that loneliness increases the likelihood of reporting headaches, stomach aches, back pain, and visits to the doctor (Sickley et al., 2016; Eccles, Qualter, Madsen, & Holstein, 2020; Qualter et al., 2013). Additionally, adolescents who are lonely are more likely to perceive their health quality as lower than adolescents who are not lonely (Eccles, Qualter, Madsen, & Holstein, 2020; Goosby, Bellatorre, Walsemann, & Cheadle,

2013; Mahon, Yarcheski, & Yarcheski, 1993). Lonely youth also report higher rates of sleep problems (Eccles, Qualter, Madsen, & Holstein, 2020; Harris, Qualter, & Robinson, 2013) and shorter sleep duration (Doane & Thurston, 2014). Adolescents who are lonely also suffer from worse mental health outcomes. Specifically, adolescent loneliness is associated with higher levels of depression (Goosby, Bellatorre, Walsemann, & Cheadle, 2013; Qualter et al., 2013) and anxiety (Sickley et al., 2016), lower levels of self-esteem (Brage, Meredith, & Woodward, 1993), and a higher likelihood of substance use (Stickley, Kusanagi, Okposo, Schwab-Stone, & Ruchkin, 2014).

Given these negative consequences, developmental scholars have sought to better understand antecedents of loneliness and to identify protective factors during adolescence. When adolescents are not chronically lonely, they are more engaged in their schoolwork and have increased self-worth, self-esteem, and self-efficacy (Hall-Lande, Eisenberg, Christenson, & Neumark-Sztainer, 2007). Additionally, high friendship quality, which is predictive of low loneliness (Heinrich & Gullone, 2006; Parker & Asher, 1993), aids youth in their communication skills, emotional self-regulation, and decision making (Cuadros & Berger, 2016). High friendship quality has also been linked to lower internalizing and externalizing symptoms and less social withdrawal (Collibee, LeTard, & Aikins, 2016). High quality friendships that protect against loneliness act as buffers against adversity. Not only through high friendship quality, but loneliness-reducing school belongingness also predicts lower levels of suicidal behavior, substance use, risky sexual behaviors, and other psychological problems (Hall-Lande, Eisenberg, Christenson, & Neumark-Sztainer, 2007).

Developmental Framing of the Role of Social Relationships for Loneliness

As children move into adolescence, they undergo numerous changes in the ways in which they relate to others, acquire social satiation, and experience loneliness. During this time of rapid change, adolescents begin to develop needs for social relationships that are quite different from their pre-pubescent needs. Specifically, as youth gain greater awareness of themselves and how they fit in with their social world, their perceptions of themselves and others, as well as what they need from others, changes. Qualter et al. (2015) posit that these developmental changes result in needs for close friendships, desires to belong to groups, and motivations to be well-liked and accepted by peers. Additionally, Qualter's life-span model of loneliness suggests that changes in social needs occur over the *course* of adolescence. In fact, even from the 6th to 9th grade, adolescents need different types of relationships and social experiences such as peer, familial, and romantic relationships to feel satiated. Specifically, 6th graders acquire most of their social support from parents (Cavanaugh & Buehler, 2016), and 9th graders desire social support from close friends and romantic partners (Laursen & Hartl, 2013; Vanhalst, Luyckx, & Goossens, 2013). As discussed, when youth and all people do not feel satisfied by their relationships, that discrepancy may cause loneliness, depression, and other psychological struggles. For adolescents specifically, because of the developmental changes in social, relationships, supports, and needs, loneliness increases dramatically during this period of life.

Changes in the Role and Impact of Social Relationships Across Adolescence

During adolescence, youth undergo substantial changes in identity development, cognitive skills, autonomy, and organization of social relationships (Sanders, 2013; Collins, Gleason, & Sesma, 1997). Achieving these developmental milestones is aided by social relationships, which also undergo a significant re-organization during this developmental period (McFarland, Moody, Diehl, Smith, & Reuben, 2014). Peers play a defining role in helping adolescents establish their interests and goals. Peer relationships and how adolescents are perceived by their peers becomes very focal during this time, and social relationships are often a primary source of information and guidance in establishing who oneself is in the world (Meeus & Dekovic, 1995). Additionally, relationships and interactions with peers allow for adolescents to exercise and grow in cognitive development tasks such as role taking, abstract thought, and long-term goal setting (Choudhury, Blakemore, & Charman, 2006; Urdan, 1997; Wang, Kiuru, Degol, & Salmelo-Aro, 2018). Negotiating and achieving autonomy and independence from parents, another adolescent-specific developmental task (Allen, Hauser, Bell, & O'Connor, 1994), is also implicated in social relationships. Friends and romantic partners aid adolescents both in establishing healthy separation from parents as well as providing support in situations where parental behaviors are counterproductive to the establishment of autonomy (Rabaglietti & Ciaran, 2008; Collibee, LeTard, & Aikins, 2016).

Associations between Social Relationship Types, Qualities, and Loneliness

Because adolescents develop and live within multiple contexts such as home, school, and their community, it is important to examine the relationships and social support they encounter among all of these contexts (Smetana, Campione-Barr, & Metzger, 2006).

Developmental differences result in varying needs in qualities and types of relationships, and thus, it is important to examine multiple forms of social support simultaneously or our understandings of how social support impact loneliness for early and middle adolescents may be undermined. Furthermore, Qualter et al's (2015) life-span model for loneliness acknowledges that there may be several sources of loneliness in each developmental period. The majority of prior research has examined loneliness relative to only one or two sources of social relationships and support at one time (Mahon, Yarcheski, Yarcheski, Cannella, & Hanks, 2006; Zhang, Gao, Fokkema, Alterman, & Liu, 2015), and the current study will extend the research on social support and loneliness by inclusion of feelings about support from parents, friends, romantic partners, and characteristics of peer networks in several models.

Relationships with Parents

For 6th graders, the most important source of support emanates from their relationships with their parents. Parental relationships are particularly salient in importance for 6th graders because at this stage in adolescence, youth have not yet established autonomy from their parents. Instead of depending upon friends for emotional and instrumental support, 6th graders seek comfort and guidance from their parental figures whom they perceive fulfill their socioemotional needs (Cavanaugh & Buehler, 2016; Hombrados-Mendieta, Gomez-Jacinto, Dominguez-Fuentes, Garcia-Leiva, & Catro-Trave, 2012). Support received from parents predicts lower levels of loneliness above and beyond support from peers, teachers, and interparental support (Cavanaugh & Buehler, 2016). 6th graders report enjoying time spent with their parents on evenings and

weekends (Laursen & Hartl, 2013), and it is likely that parents provide not only emotional support, but also instrumental support (Cavanaugh & Buehler, 2016). For example, parents are useful in protecting their 6th graders from loneliness by providing warmth and closeness (Chen, Liu, & Li, 2000), as well as scheduling time with and transporting them to their friends. Tian & colleagues (2012) found that adolescents with high parental support experienced an enhancing effect of their high friendship support in reducing loneliness.

Compared to 6th graders, 9th graders are not expected to gain as much protection from loneliness from parental support. Tian and colleagues (2012) found that high levels of parental support did not enhance the loneliness-reducing benefits of high friendship quality. This finding is likely due to the developmental changes that occur in middle adolescence. Specifically, during the 9th grade, youth are beginning to establish autonomy and independence from their parents (Qualter et al., 2015). As 9th graders are relying less on their parents for emotional and instrumental support, they begin seeking out peers and peer groups for social satiation. Furthermore, 9th graders exhibit an increase in peer-related loneliness and a decrease in parent-related loneliness, suggesting that this age group is more oriented towards their peers (Marcoen & Brumagne, 1985). Roedel & colleagues (2014) also observed a spillover effect of loneliness when 9th graders entered the company of family after being alone; this effect was opposite when they entered the company of peers. Additionally, as where 6th graders report feeling content spending weekends and evenings with their parents, 9th graders report high levels of loneliness (Laursen & Hartl, 2013). Furthermore, Qualter et al.'s (2015) lifespan model of

loneliness lends support for these empirical studies in that the primary source of loneliness for 6th graders is derived from a lack of parental support. Taken together, this evidence suggests that parental support may be most impactful for younger youth rather than older youth given their developmental differences in autonomy and independence.

Relationships with Peers

Friends

Friends become a primary source of support for adolescents as their increased capacity for intimacy allows them to transition away from simplistic playmate relationships to deeper friendships. Friends assist adolescents in forming their values and identifying who they are amid the contexts in which they live. Because, during this developmental period, awareness of the self and how it is perceived by others is especially relevant, friendship integration becomes fundamental to well-being and self-concept. Adolescents report increased desire close friends in which they can share their thoughts and feelings with, and Qualter et al's (2015) life-span model of loneliness indicates that the lack of a close friend is a prominent source of loneliness for both 6th and 9th graders. When 6th graders lack a close friend or reciprocal friends, they are at greater risk for experiencing loneliness (Lodder, Scholte, Goossens, & Verhagen, 2015). Even for socially anxious and victimized 6th graders, having more close friendships protects against the loneliness (Erath, Flanagan, Bierman, & Tu, 2010).

The developmental need for close friendships grows throughout adolescence. 9th graders also experience increased levels of loneliness when they lack a close friend (Vanhalst, Luyckx, & Goossens, 2013). As youth enter high school at about the age of

15, the desire to be validated and understood by a close friend develops rapidly and has implications if that need is not met (Qualter et al., 2015; Parker & Asher, 1993).

Interestingly, having a high-quality friendship can buffer against effects of low levels of autonomy in middle adolescents; when 9th graders have harsh parents that do not support or allow them to establish their autonomy effectively, having a communicative and empathetic close friend serves to protect against harsh parenting that may undercut autonomy development (Collibee, LeTard, & Aikins, 2016).

Having a close friend whom to share feelings with and be validated by is important in predicting loneliness for both age groups; however, because 9th graders are becoming autonomous from their parents and 6th graders are not quite at this stage, lacking a close friend is more detrimental for 9th graders than for 6th graders. In accordance with Qualter et al., (2015) although both 6th and 9th graders experience loneliness when they lack a close friend, the absence of a close friend is the primary source of loneliness for 9th graders. Given the shift from reliance on parental support to reliance on friendship support in middle adolescence, the research suggests that support from peers and friendship integration may be more beneficial in reducing loneliness for 9th graders than 6th graders.

Online Versus In-Person Friendships

As use of social media and social networking sites (SNS) has increased heavily in the last several years (Pew Research Center, 2018), it is useful to examine how online friends impact adolescent loneliness relative to in-person friends. Previous research has yielded mixed findings on the effects of online friendships and SNS on loneliness in

adolescence. In a study of adolescents and emerging adults, those who reported communication to be the most important reason for using of the internet also reported using emotion expression and social coping to mitigate loneliness (Seepersad, 2004). Furthermore, the variety of communication partners in SNS may also lead to a decrease in adolescent loneliness (Visser, Antheunis, & Schouten, 2013). Additionally, high levels of internet use have been associated with high levels of emotional loneliness and low levels of social loneliness, and high degrees of face-to-face friendship networking has been associated with low levels of both social and emotional loneliness (Moody, 2001). Because of the mixed findings on how online friends and social networking use may affect loneliness in adolescence, feelings about support from online friends will be investigated in an exploratory manner.

Peer Rejection

Early adolescence is a time where children are establishing their group identity, and an increase in self-awareness produces a need to be accepted and not rejected by peers (Gifford-Smith & Brownwell, 2003). 6th graders begin to acknowledge and worry about how they measure up amongst their peers, and if they will be accepted by them (Crone & Dahl, 2012). Furthermore, Qualter et al's (2015) life-span model for loneliness posits that acceptance by a peer group is a dominant need for belonging for 6th graders (Qualter et al., 2015; Cacioppo, Grippo, London, Goossens, & Cacioppo, 2015). Being accepted by peers confers to an adolescent their standing relative to other teens, and as a result, they are less likely to feel lonely if they are accepted by a group (Zhang et al., 2014).

Peer rejection is a prominent source of loneliness for 6th graders. Belonging to a peer group exposes adolescents to a greater number of interactions and friends, decreasing the likelihood of loneliness. Low acceptance into a peer group also affects adolescent satisfaction with adolescent close relationships. Even 6th graders who have best friendships suffer lower quality in those friendships if they have low peer acceptance (Gifford-Smith & Brownwell, 2003). Furthermore, 6th graders with low peer acceptance also have fewer reciprocal best friendships (Gifford-Smith & Brownell, 2003), which increases the likelihood of loneliness (Nangle, Erdley, Newman, Mason, & Carpenter 2003; Lodder, Scholte, Goossens, & Verhagen, 2015). Research has also documented that clique isolation produces loneliness, which subsequently increases depressive symptoms for early adolescents (Witvliet, Brendgen, van Lier, Koot, & Vitaro, 2010). Because entrance into middle school is the time when self-awareness increases and adolescents begin to consider how they fit in and compare to those around them, peer acceptance and rejection is more predictive of loneliness for 6th graders than 9th graders.

Romantic Relationships

As early adolescents transition to high school, their capacity for and interest in romantic partner relationships increases (Baumeister & Leary, 1995). Because of this newfound desire for a romantic partner and increased ability to engage in intimate partner relationships, not having a romantic partner is a prominent source of loneliness for 9th graders (Qualter et al., 2015). Furthermore, the life-span model for loneliness indicates that even the lack of being considered as a potential mate by peers is a prominent source of loneliness. Laursen & colleagues (2013) documented that single same-sex friends

spending time together may be perceived to them as social isolation in a time when dating is desired and expected. Although they are within a peer group and spending time with a peer group, this source of social interaction and relationship does not satiate social needs the way that a romantic partner would. 9th graders in romantic relationships also begin spending a significant amount of time with their opposite sex partner, and time spent without them can also be a source of loneliness (Laursen & Hartl, 2013).

Because the formation of romantic relationships in middle adolescence is a defining milestone in their trajectory toward reaching social maturity (Connolly, Furman, & Konarski, 2000; Connolly, Pepler, Craig, & Taradash, 2000), the implications of obtaining or maintaining a romantic relationship in the 9th grade has implications for loneliness and other forms of psychological adjustment (Smetana, Campione-Barr, & Metzger, 2006). This developmental change has not quite occurred for 6th graders, and thus, lacking a romantic companion is not a source of loneliness for them. Inversely, for high school students, simply being involved in a romantic relationship protects against loneliness (Woodhouse, Dykas, & Cassidy, 2011). Additionally, having romantic security or stability and commitment in a romantic relationship also results in lower levels of loneliness for 9th graders (Chow, Ruhl, & Buhrmester, 2015). Importantly, the authors of this study also found that friendship closeness moderated the relationships between both romantic involvement and romantic security and loneliness, highlighting the importance of both romantic and close friendship involvement in the 9th grade.

Romantic relationships and close friendships are so important for reducing loneliness levels in the 9th grade that even family ties and stressful family environments

do not significantly impact satisfaction with romantic relationships or loneliness (Degi & Faludi, 2014). 9th graders rely so much more heavily on friends and romantic relationships than do 6th graders, and thus do not experience the same extent of negative influence from family stress that middle schoolers would. Chen (2003) found that feelings of belongingness to family predicted lower levels of loneliness for 6th graders, but not for 9th graders. Additionally, in this same study, the author found that 9th graders who had romantic partners felt a sense of romantic belongingness that heavily decreased their levels of loneliness. Furthermore, having a past romantic partner did not predict loneliness; this suggests that current involvement in a romantic relationship, and not romantic relationship history, is necessary for this specific loneliness-reducing effect (Chen, 2003). Given the developmental differences in the 6th and 9th grade, the research posits that involvement in romantic relationships is much more effective in reducing loneliness for middle adolescents than early adolescents. Additionally, Qualter et al's (2015) life-span model for loneliness does not indicate a lack of a romantic partner or interest from a potential romantic partner to be a source of loneliness for 6th graders.

In the present study, participants are asked to indicate whether or not they are currently in a romantic relationship. Although this measure identifies that a participant may or may not be receiving support from a romantic partner, it does not elaborate on the quality of the support received. Additionally, the measure does not encompass the participants' desire to date, whether or not they have permission from their parents to date, or if they have religious or cultural orientations that prevent them from engaging in

dating. Since the present study's dating variable does not allow for inclusion of these confounds, results will be interpreted cautiously.

CHAPTER TWO

The Present Study

Because loneliness has detrimental effects on health and wellness and occurs most prevalently among the adolescent population, studying its correlates is imperative for promoting adolescent health and wellbeing. The present study conducted an empirical test of a Qualter et al.'s (2015) life-span model of loneliness suggesting that for early adolescents, family support, friendship support, and peer integration would be most predictive of loneliness, whereas for middle adolescents, friendship support and having a romantic partner would be most strongly associated with loneliness. Previous research has not comprehensively examined unique contributions of multiple types of social relationships in a same study, and the present study addresses this gap.

Prior to testing these age-related differences in predictors of loneliness, a baseline model examined the associations between multiple types of social relationships, peer network characteristics, and adolescent loneliness. The baseline model sought to test and replicate several hypotheses from the past research. It was hypothesized that perceived support from family would be negatively associated with loneliness (hypothesis 1). Next, it was hypothesized that feelings about support from friends would be negatively associated with loneliness (hypothesis 2). It was also expected that friendship network popularity and activity would be negatively associated with loneliness (hypotheses 3 and

4), and rejection network popularity and activity would be positively associated with loneliness (hypotheses 5 and 6). Because loneliness is conceptualized as a discrepancy between desired social connection and actual social connection (Cacioppo, Cacioppo, & Boomsma, 2013), it was expected that friendship network activity would be more strongly, negatively associated with loneliness than friendship network popularity (hypothesis 7). As research has demonstrated that loneliness is more strongly associated with being rejected by peers than disliking peers (Gorman, Schwartz, Nakamoto, & Mayeux, 2011; Demir & Tarhan, 1999), I hypothesized that the rejection network popularity would be more strongly, positively associated with loneliness than rejection network activity (hypothesis 8).

Next, we move to testing hypotheses derived from Qualter et al's (2015) model that 6th graders rely on parents for support more than 9th graders do, it was hypothesized that feelings about family support would be more negatively associated with loneliness for 6th graders compared to 9th graders (hypothesis 9). Subsequently, Qualter's model indicates that close friends are more effective in reducing loneliness for middle adolescents, so feelings about friend support were expected to be more negatively associated with loneliness for 9th graders compared to 6th graders (hypothesis 10). Next, we considered hypotheses derived from Qualter et al's (2015) model that indicated that peer acceptance and integration would be more relevant in predicting loneliness for early adolescents than middle adolescents. Thus, it was hypothesized that the associations between friendship and rejection network positions (i.e., friendship and rejection network popularity and activity) would be more pronounced for 6th graders compared to 9th

graders (hypotheses 11-14). Furthermore, using guidance from Qualter et al's (2015) model, it was hypothesized that early and middle adolescents would differ in the strength of the association between dating status and loneliness. Specifically, endorsement of dating (hypothesis 15) was expected to be more strongly and negatively associated with loneliness for 9th graders than 6th graders. Lastly, because of the mixed findings on the association between online friends and loneliness, perceived support from online friends will be approached in an exploratory manner (research question 16).

Methods

Participants

Participants consisted of 714 middle and high school students from a public school district in the Southwestern U.S. 279 6th graders and 435 9th graders participated in the study. Participants were 51% female and 49% male. Mean age was 13.73 (*SD* = 1.54, range: 10-16 years). Ethnic/racial composition was diverse: 28% white, 7% African American, and 50.8% Hispanic/Latino, 1.3% Asian, and 2% American Indian or Alaska Native. The study procedures were approved by the university's institutional review board.

Participants were recruited from two 6th grades from two middle schools and two 9th grades from two high schools from a large public school district located in a southwestern US metropolitan city. Middle school A was composed of 361 students, 50.14% boys and 49.86% girls; 4.16% American Indian/Alaska Native, 9.14% Black, 79.22% Hispanic, 5.54% White, 1.94% Two or More Races; 78.67% of students were eligible to receive free and reduced lunch. Middle school B was composed of 1,020

students, 50.69% boys and 49.31% girls; 2.94% American Indian/Alaska Native, 1.08% Asian, 6.18% Black, 71.47% Hispanic, 15.2% White, 3.14% Two or More Races; 55.98% of students were eligible to receive free and reduced lunch. High school A was composed of 929 students, 48.87% boys and 51.13% girls; 0.22% American Indian/Alaska Native, 1.51% Asian, 4.41% Black, 36.6% Hispanic, 0.32% Native Hawaiian/Pacific Islander, 51.02% White, 5.92% Two or More Races; 30.89% of students were eligible to receive free and reduced lunch. High school B was composed of 1,712 students, 50.64% boys and 49.36% girls; 0.76% American Indian/Alaska Native, 2.39% Asian, 7.59% Black, 43.11% Hispanic, 0.58% Native Hawaiian/Pacific Islander, 39.72% White, 5.84% Two or More Races; 38.9% of students were eligible to receive free and reduced lunch.

Procedure

Participants were 6th grade students from two public middle schools and 9th grade students from two public high schools in a metropolitan city in the Southwestern U.S. Students were sent home parental consent letters in both English and Spanish. Students received \$10 for returning their signed parental consents, regardless of parents' decision to participate or not participate in the study. School teachers reminded students to remind parents to return signed parental consent letters, regardless of decision, and were provided with \$50 and two movie tickets to express the researchers' appreciation for their efforts in reminding students to return consent forms. Participating students provided assent prior to completing their surveys.

Data collection took place in December 2019 and early January 2020. Participants completed self-reported questionnaires during their regular school hours over two class periods (approximately 90 minutes in total). School staff and research project assistants were available to answer any questions as participants completed their surveys.

Measures

Feelings About Support from Parents

Feelings about support from parents was measured with the Family subscale of Feelings About Support Scale was used (Ermis-Demirtas et al., 2018). This subscale assessed the extent to which participants feel supported by their parents and consisted of four questions measured on a seven-point scale, ranging from 1 = *strongly disagree* to 7 = *strongly agree*. The Cronbach's alpha internal consistency estimate for this scale was .901.

Feelings About Support from Friends

Feelings about support from friends was measured with the Friends subscale of Feelings About Support Scale was used (Ermis-Demirtas et al., 2018). This subscale assessed the extent to which participants feel supported by their friends and consisted of four questions measured on a seven-point scale, ranging from 1 = *strongly disagree* to 7 = *strongly agree*. The Cronbach's alpha internal consistency estimate for this scale was .904.

Feelings About Support from Online Friends

Feelings about support from online friends was measured with the Online Friends subscale of Feelings about Support Scale was used (Ermis-Demirtas et al., 2018). This

scale assessed the extent to which participants feel supported by their online friends and consisted of four questions measured on a seven-point scale, ranging from 1 = *strongly disagree* to 7 = *strongly agree*. The Cronbach's alpha internal consistency estimate for this scale was .952.

Characteristics of Peer Networks

Friendship network popularity was measured by the number of incoming friendship nominations (friendship indegree). *Friendship network activity or gregariousness* was measured by the number of outgoing friendship nominations (friendship outdegree). *Rejection network popularity* was measured by the number of incoming dislike nominations (rejection indegree). *Rejection network activity* was measured by the number of outgoing dislike nominations (rejection outdegree). These data were used to compute indices of network position.

Endorsement of Dating

To determine whether participants were actively involved in romantic relationships, participants were asked if they were currently dating and answered "yes" or "no."

Loneliness

Loneliness was measured with four questions from the 20-item original UCLA Loneliness Scale (Russell, Peplau, & Ferguson, 1978). These questions assessed the extent to which participants felt left out, a lack of companionship, isolation from others, and the absence of someone to turn to for support. Questions were assessed on a three-

point scale, ranging from 1 = *hardly ever* to 3 = *often*. The Cronbach alpha reliability estimate for this scale was .960.

Plan of Analysis

A series of multiple regressions were conducted to test this study's hypotheses. The individual predictors were centered to reduce multi-collinearity (Iacobucci, Schneider, Popovich, Bakamitsos, 2016). Interaction terms were computed between a social relationship construct and a dummy code for grade, which allowed comparison of the strength of social relationship-loneliness associations between early and middle adolescents. A baseline multiple regression model was run which included only the main effects – and not interactions – of all social relationship constructs, control variables, and dummy-coded variables for gender and grade. Then, to test the hypotheses, a series of regression models were conducted that included an interaction term between each social relationship construct and a dummy-code for grade (0= 6th grade and 1= 9th grade); these interactions were added one at a time to prevent overparameterization of the model. To examine how family support, friend support, dating, and peer network characteristics were associated with loneliness, we analyzed all relationship types and peer network characteristics in an initial baseline model. In the baseline model, we examined the associations between loneliness and family support, friend support, friendship network popularity and activity, and rejection network popularity and activity (hypotheses 1-6). The same model was used to examine hypotheses 7 and 8, that friendship network activity would be more strongly related to loneliness than friendship network popularity, and that rejection network popularity would be more strongly related to loneliness than

rejection network activity. The ninth hypothesis (i.e., family support was a stronger predictor of loneliness for 6th graders than 9th graders) was tested by running a regression model with the interaction term between family support and grade. Next, to test the tenth hypothesis, that friendship support would be a stronger predictor of loneliness for 9th graders than 6th graders, a regression model was conducted that included the interaction term between friends support and grade. To determine whether peer network characteristics were stronger predictors of loneliness for 6th graders than 9th graders (hypotheses 11-14), an interaction term for grade by each peer network characteristic (friendship network activity, friendship network popularity, rejection network activity, and rejection network popularity) were entered into separate regression models. The last hypothesis (hypothesis 15) that dating is more predictive of loneliness for 9th graders than 6th graders was tested in the same manner in that the new model included the hypothesis-specific interaction term. These models allowed examining differences between early and middle adolescents in how each social relationship construct was associated with loneliness levels. Significant interaction terms were followed up by interaction tests and plots to identify the direction and strength of the age-related differences.

CHAPTER THREE

Results

An initial linear regression model including all of the predictors and controls without interactions was performed and indicated that several variables significantly predicted loneliness. Perceived family support ($b = -.067, t(484) = -4.37, p < .001$), perceived friend support ($b = -.062, t(484) = -3.55, p < .001$), perceived support from online peers ($b = .037, t(484) = 3.13, p < .01$), friendship network popularity ($b = -.016, t(484) = -.217, p < .05$), and gender ($b = .220, t(484) = 4.76, p < .001$) significantly predicted loneliness. These results lent support for hypotheses 1-3. Aside from friendship network popularity, none of the remaining peer network characteristics significantly predicted loneliness, and therefore did not lend support for hypotheses 4, 5, and 6. Additionally, we found no support for hypotheses 7 and 8 that friendship network activity would be more predictive of loneliness than friendship network popularity, and rejection network popularity would be more predictive of loneliness than rejection network activity. The model explained a significant proportion of variance in loneliness levels, adjusted $R^2 = .14, F(10, 494) = 9.23, p < .001$. Subsequent models included all of the predictors in the first model and an additional interaction term.

Next, we performed a linear regression model that included an interaction term between grade (0= 6 grade and 1= 9 grade) by perceived family support to address

hypothesis #9, that family support would be a stronger predictor of loneliness for 6th graders than 9th graders. The model provided evidence for a significant moderation effect of grade in predicting loneliness ($b = .088, p < .01$). The model explained a significant proportion of variance in loneliness levels, adjusted $R^2 = .02, F(1, 483) = 8.97, p < .05$. The significance of the interaction lend support for our hypothesis that at high levels of family support, 6th graders reported less loneliness than 9th graders (see *Figure 1*).

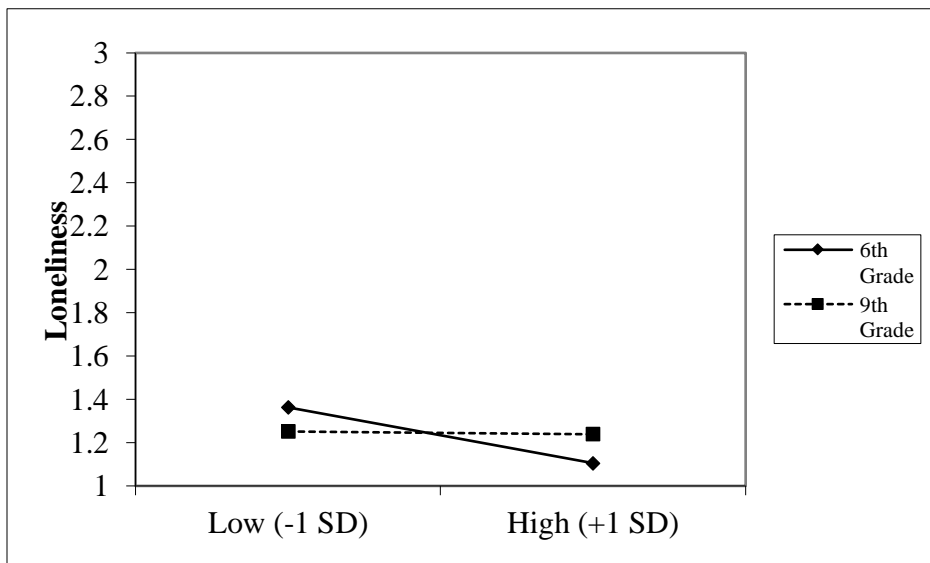


Figure 1. Perceived family support by grade in predicting loneliness.

To address hypothesis #10, that friend support would be a stronger predictor of loneliness for 9th graders than 6th graders, we performed a linear regression model that included an interaction term of grade by perceived friend support. The interaction was

nonsignificant ($b = .019, t(483) = .589, p = .556$) indicating that the effect of perceived friend support on loneliness did not differ by grade. The results did not support our hypothesis that friendship support would be more beneficial in reducing loneliness for 9th graders than 6th graders.

We continued with a linear regression model that included an interaction term of grade by friendship network popularity to address hypothesis #11, that friendship network popularity would be a stronger predictor of loneliness for 6th graders than 9th graders. The interaction was nonsignificant ($b = -.010, t(483) = -.686, p = .493$), indicating that the amount of friendship network popularity did not impact loneliness differently by grade. The next model performed included an interaction term of grade by friendship network activity to address hypothesis #12, that friendship network activity would be a stronger predictor of loneliness for 6th graders than 9th graders. The interaction was nonsignificant ($b = -.004, t(483) = -.210, p = .834$), indicating that friendship network activity did not impact loneliness differently by grade. Another model performed included an interaction term of grade by rejection network popularity to address hypothesis #13, that rejection network popularity would be more predictive of loneliness for 6th graders than 9th graders. The interaction was nonsignificant ($b = .028, t(483) = .985, p = .325$), indicating that rejection network popularity did not impact loneliness differently by grade. The results did not lend support for our hypothesis that rejection network popularity would impact loneliness more strongly for 6th graders than 9th graders. The final model performed included an interaction term of grade by rejection network activity to address hypothesis #14, that rejection network activity would be more

predictive of loneliness for 6th graders than 9th graders. The interaction was nonsignificant ($b = .037, t(483) = 1.651, p = .099$), indicating that rejection network activity did not impact loneliness differently by grade.

The next linear regression model performed included an interaction term of grade by dating to address hypothesis #15, that dating would be a stronger predictor of loneliness for 9th graders than 6th graders. The interaction was significant ($b = .282, t(483) = 2.00, p < .05$), indicating that the effect of currently dating on loneliness differed by grade. The model explained a significant proportion of variance in loneliness levels, adjusted $R^2 = .007, F(1, 483) = 4.01, p < .05$. The results indicated that dating in the 9th grade is associated with increased loneliness levels, and thus, did not lend support for our hypothesis that the endorsement of dating would be more beneficial for reducing loneliness in 9th graders than 6th graders (see *Figure 2*).



Figure 2. Endorsement of dating by grade in predicting loneliness.

Finally, we performed a linear regression model that included an interaction term of grade by perceived online peer support to investigate whether or not online peer support's effect on loneliness was moderated by grade. The interaction was nonsignificant ($b = -.010$, $t(483) = .414$ $p = .679$) indicating that the effect of perceived online peer support on loneliness did not differ by grade. Our investigation of the effects of online peer support was approached in an exploratory manner.

Table 1

Descriptive Statistics

Variable	M	SD	1	2	3	4	5	6	7	8	9
1. Loneliness	1.51	0.54	-								
2. Family Support	5.26	1.61	.265**	-							
3. Friend Support	5.58	1.44	.214**	.393**	-						
4. Online Peer Support	3.65	1.95	0.08	.030	.153**	-					
5. Friend Network Popularity	5.09	3.36	-.126*	.000	.160**	.007	-				
6. Friend Network Activity	5.09	2.65	-.102*	.011	.148**	.026	.365**	-			
7. Rejection Network Popularity	1.09	1.63	.102*	-.071	-.015	-.01	.123**	.020	-		
8. Rejection Network Activity	1.09	2.01	.029	-.014	.054	.032	.154**	.276**	.108**	-	
9. Dating	1.82		-.013	-.014	-.059	-.002	-.022	-.031	.072	-.059	-

Table 2

OLS Regression of Predictors of Loneliness and Interactions by Grade

Coefficients	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7		Model 8		Model 9			
	β (SE)	p	β (SE)	p	β (SE)	p	β (SE)	p	β (SE)	p	β (SE)	p	β (SE)	p	β (SE)	p	β (SE)	p		
Grade	.021 (.051)		.010 (.050)		.020 (.051)		(.020) (.051)		.026 (.051)		.024 (.053)		.017 (.051)		.009 (.051)				-.019 (.054)	
Gender	.220 (.046)	***	.213 (.046)	***	.219 (.046)	***	.219 (.046)	***	.220 (.046)	***	.220 (.046)	**	.219 (.046)	***	.221 (.046)	***			.217 (.046)	***
Family Support	-.067 (.015)	***	-.095 (.018)	***	-.068 (.015)	***	-.067 (.015)	***	-.068 (.015)	***	-.067 (.015)	**	-.067 (.015)	***	-.066 (.015)	***			-.066 (.015)	***
Friend Support	-.062 (.018)	***	-.069 (.018)	***	-.068 (.021)	**	-.062 (.018)	***	-.062 (.018)	***	-.062 (.018)	*	-.063 (.018)	***	-.062 (.017)	***			-.061 (.017)	***
Online Support	.037 (.012)	**	.037 (.009)	**	.037 (.012)	**	.040 (.014)	**	.037 (.012)	**	.037 (.012)	**	.037 (.012)	**	.037 (.012)	**			.037 (.012)	**
Friend Network Popularity	-.016 (.007)	*	-.014 (.007)		(-.016) (.007)	*	-.015 (.007)	*	-.012 (.009)		-.015 (.007)		-.015 (.007)	*	-.016 (.007)	*			-.016 (.007)	*
Friend Network Activity	-.009 (.010)		-.010 (.010)		-.009 (.010)		-.009 (.010)		-.009 (.010)		-.008 (.011)		-.009 (.010)		-.009 (.010)				-.008 (.010)	
Rejection Network Popularity	.022 (.014)		.022 (.014)		.022 (.014)		.022 (.014)		.022 (.014)		.022 (.014)		.012 (.017)		.021 (.014)				.021 (.014)	
Rejection Network Activity	.015 (.011)		.016 (.011)		.015 (.011)		.015 (.011)		.016 (.011)		.015 (.011)		.015 (.011)		.015 (.011)				.014 (.011)	
Dating	-.001 (.057)		(.056) (.068)		.001 (.057)		-.001 (.057)		.001 (.057)		-.001 (.057)		.000 (.057)		-.008 (.057)				-.056 (.063)	
Grade x Family Support			.088 (.029)	**																

Grade x Friend Support	.019 (.032)				
Grade x Online Support		-.010 (.025)			
Grade x Friend Network Popularity			-.010 (.014)		
Grade x Friend Network Activity				-.004 (.019)	
Grade x Rejection Network Popularity					.028 (.029)
Grade x Rejection Network Activity					.037 (.023)
Grade x Dating					.282 (.141) *

Note. * $p < .05$; ** $p < .01$, *** $p < .001$. ¹Grade is coded as 1 = 9th grade, 0 = 6th grade. Gender is coded as 1 = male, 0 = female.

CHAPTER 4

Discussion

Developmental research and Qualter et al's (2015) lifespan model of loneliness indicate that changes in social relationships and social needs during adolescence produce age-related differences in sources of loneliness. Specifically, early adolescents (6th graders) begin developing a greater capacity for intimate, close relationships; however, they rely more on their parents than close friends for support as they have not yet established autonomy from their parents (Cavanaugh & Buehler, 2016). Therefore, these relationships were expected to be more consequential for younger adolescents' subjective appraisal of their social connectedness, or loneliness. The present study's results supported this hypothesis. In contrast, middle adolescents (9th graders) have begun establishing autonomy from their parents, and thus, rely more on friends than parents for social support (Qualter et al., 2015); thus, it was expected that middle adolescents' social relationships with peers and friends would be most consequential for their loneliness levels. The present study results did not support this hypotheses of enhanced associations between friendship characteristics and loneliness among middle adolescents. Furthermore, because past research has shown that middle adolescents' greater capacity for intimacy and desire for a romantic partner (Vanhalst, Luyckx, & Goossens, 2013; Woodhouse, Dykas, & Cassidy, 2011), it was hypothesized that their primary sources of loneliness

stem from the lack of a close friend and the absence of a romantic partner. Contrary to expectations and previous research, our results indicated an opposite effect in that loneliness was higher for 9th graders that were dating than for 6th graders that were dating. Previous research on adolescent social relationships and loneliness often fails to address these developmental differences across adolescence, and rather, examines loneliness in adolescence regardless of a developmental period within adolescence. Taken together, the results lent partial support for Qualter et al's (2015) propositions that 6th graders depend more on their families for social support than 9th graders, for whom relationships with friends, peers, and romantic partners were hypothesized to be more strongly associated with loneliness. None of the other hypothesized age-related differences in sources of loneliness were detected. These results have implications for developmental theory and are discussed below.

Associations between Family, Friends, and Romantic Relationships Characteristics and Loneliness

Prior to considering age-related differences in sources of loneliness in detail, we consider the universal contributions of multiple indices of social relationships to loneliness for all adolescents. The baseline model showed that perceived family support, friend support, and friendship network popularity were negatively associated with loneliness for all adolescents. As expected, adolescents benefitted from family and friend support, as well as friendship network popularity in reducing loneliness. The results of the current study also indicated that friendship network activity and rejection network activity and popularity were not associated with loneliness. These findings do not align

with previous research that demonstrates that loneliness is negatively associated with the number of friends adolescents perceive themselves to have (Lodder, Scholte, Goossens, & Verhagen, 2015), and disliking other peers and being rejected by peers are both associated with increased levels of loneliness (Gorman, Schwartz, Nakamoto, & Mayeux, 2011; Demir & Tarhan, 1999).

In line with previous research (Cavanaugh & Buehler, 2016; Uruk & Demir, 2002), perceived support from family is effective in reducing loneliness for both early and middle adolescents. Despite the onset of autonomy from parents during middle adolescents (Marcoen & Brumagne, 1985; Qualter et al., 2015), 9th graders in our sample still benefitted from support from their families in reducing loneliness. The measure of family support in the current study did not differentiate between support received from parents or other family members. Future research may benefit from examining parents and sibling relationships discretely to more accurately discern which members of the family are reducing loneliness for middle adolescents. In addition, support from friends was also associated with lower levels of loneliness in both early and middle adolescents. Although early adolescents depend more on their parents for support than do middle adolescents, support from friends and friendship network popularity was still beneficial in reducing loneliness for the 6th graders in our sample. These findings are in line with previous research on early adolescent loneliness and friendship. Specifically, Lodder, Scholte, Goossens, and Verhagen (2015) found that early adolescents who lack a close friend are at increased risk for loneliness. Furthermore, Qualter et al.'s (2015) lifespan

model of loneliness indicates that being liked by peers is a central belonging need for early adolescents.

According to research on peer network characteristics and loneliness, friendship network activity (indicated by the number of outgoing friendship nominations) and friendship network popularity (indicated by the number of incoming friendship nominations) are both negatively related to loneliness (Lodder, Scholte, Goossens, & Verhagen, 2015). Furthermore, research indicates that rejection network popularity (indicated by the number of incoming nominations of dislike) is positively associated with loneliness (Gifford-Smith & Brownell, 2003). It was also expected that rejection network popularity would be more strongly, positively associated with loneliness than rejection network activity as research indicates that being rejected by peers is more strongly associated with loneliness than disliking peers (Gorman, Schwartz, Nakamoto, & Mayeux, 2011; Demir & Tarhan, 1999). The results of our study indicated a negative relationship between friendship network popularity and loneliness, but the remainder of peer network characteristics were not associated with loneliness. The peer network measures in the current study were only able to assess quantity of incoming and outgoing friendship ties, as well as incoming and outgoing peer dislike. Because loneliness is a subjective evaluation of the quantity *and* quality of social relationships, the measures of network characteristics in the current study were not able to assess the quality of friendship and rejection network activity and popularity. Future research should aim to include peer network measures that assess the quality of the nominated friendships.

Previous research yields mixed results on the efficacy of online friends in reducing loneliness, whereas the current study found that support from online peers was positively associated with loneliness. A study by Moody (2001) found that high levels of internet use have been associated with high levels of emotional loneliness and low levels of social loneliness, but face-to-face friendship networking has been associated with low levels of both social and emotional loneliness. The results of the current study indicate that online peer friendships are positively associated with loneliness, and there was no difference in this relationship among early and middle adolescents. Studies by Seepersad (2004) and Visser, Antheunis, & Schouten (2013) indicate that loneliness was effectively reduced by use of the internet if adolescents had a variety of communication partners and if communication was reported by adolescents to be the most important use of the internet. Based on these studies and that of Moody (2001) it is possible that adolescents may benefit from various, high communicative online friendships if they are in conjunction with face-to-face friendships. Future research should examine the efficacy of online friendships in the context of in-person friendships and the quality of those relationships.

Age-Related Differences in Sources of Loneliness: Test of Life-Span Model of Loneliness

Turning to the main goal of this study in testing the propositions of the Qualter's (2015) life-span model, the key findings of this study showed on age differences in family support and endorsement of dating. The results of moderation analysis indicated that early adolescents benefitted more from family support in reducing loneliness than 9th

graders. This finding partially supports Qualter et al's (2015) life-span model of loneliness in that when family support is high, early adolescents experience less loneliness than middle adolescents. The results of a second moderation analysis indicated that currently dating in the 9th grade was associated with higher levels of loneliness than currently dating in the 6th grade. These findings are contradictory to our hypotheses and Qualter et al's (2015) model.

Developmental literature and Qualter et al's (2015) lifespan model of loneliness suggest that middle adolescents typically benefit more from friendship support than early adolescents, but our findings did not support this notion. Although middle adolescents are more friend-oriented than peer-oriented than early adolescents, early adolescents still experience reduced levels of loneliness when they report having close, intimate friendships (Lodder, Scholte, Goossens, & Verhagen, 2015). It is possible that both early and middle adolescents experience similar loneliness levels when they lack a close friend. In other words, although early adolescents acquire most of their social support from parents, perhaps the salience of close friendships in predicting loneliness in early and middle adolescence is very similar. Future research should investigate how early and middle adolescents differentially prioritize or desire support from friends to better elucidate the age-related differences observed in Qualter et al's (2015) model.

Contrary to the suppositions of Qualter et al's (2015) lifespan model of loneliness and other developmental research on the salience of romantic relationships in predicting loneliness for high schoolers, our findings did not reveal significant associations between dating and loneliness. A major limitation of our study was that the measure of dating only

included the indication of whether or not participants were currently in a romantic relationship. Participant's dating status does not allow consideration for circumstances in which participants are not interested in having a romantic relationship or allowed to date. Theory and empirical evidence demonstrate that 9th graders typically desire a romantic partner and experience reduced loneliness from dating (Woodhouse, Dykas, & Cassidy, 2011), and our dating measure did not allow us to take into consideration how religious affiliations, parental permissions, or other values may prevent adolescents from engaging in dating relationships. Furthermore, our study did not gather data on the quality of participants' romantic relationships. Chow, Ruhl, & Buhrmester (2015) found that romantic security in adolescence is negatively associated with loneliness in adolescence. Even then, adolescents may be less able to accurately evaluate the quality of their relationship because this newfound desire is novel, exciting, and uncharted. Even then, middle adolescents' newfound interest and desire for romantic relationships and lack of experience with romantic relationships may inhibit their ability to accurately evaluate the quality of the relationship. For example, Rogers, Ha, Updegraff, & Iida (2018) found that conflict and feelings about the relationship was associated with daily negative affect in dating adolescents. Albeit middle adolescents are excited about and want romantic relationships, they may not be effective in reducing their loneliness if the quality of these romantic relationships is low. Much of the research on adolescent relationships does not include comprehensive measures of romantic or sexual behavior. Future research should strive to include these measures in order to acquire a better understanding of how dating is related to loneliness in early and middle adolescence

The current study was one of the first to examine the age-related differences in the associations between several kinds of social relationships and peer network characteristics and loneliness; they were simultaneously considered in the model. We found support for Qualter et al's (2015) life-span model of loneliness in that 6th graders benefit more from family support than 9th graders in reducing loneliness. Although our study did not find support for other age-related differences or associations between peer network characteristics and loneliness, limitations in our measures prevented us from seeing these relationships more comprehensively. Specifically, the current study collected data on friendship network popularity and activity, as well as rejection network popularity and activity. Although these indices of network position have been associated with loneliness in previous research, future research needs to consider how loneliness is associated with network structure and dynamics using social network analysis approaches (e.g., Kornienko et al., 2020). Another limitation of our study was that it is cross-sectional, preventing us from making casual inferences about the findings. Future research should aim to more comprehensively measure dating and romance in adolescence, include social network analyses to assess peer network structure and dynamics, measure online versus face-to-face friendships, and conduct longitudinal research to more accurately predict loneliness among this population.

The findings from the current study have implications for developmental research, clinical practice, and school settings. Our research indicates that the primary source of loneliness for 6th graders is family, and thus, early adolescents suffering from chronic or debilitating loneliness would benefit from family-oriented or family-systems therapeutic

approaches. Furthermore, in parent-child relationships where communication is strained, clinicians should recommend therapies targeted at helping parents better communicate with and spend time with their teens. Regarding the links between friendship characteristics and loneliness, early and middle adolescents could benefit from social skills training approaches in clinical settings to improve relationships with peers and close friends. Additionally, school counselors should assess their students' abilities to form and maintain friendships, and implement school-based treatments or interventions for those struggling with loneliness and friendship related struggles.

Limitations and Future Directions

Among strengths of this study was its simultaneous consideration of age-related differences in the associations between loneliness and multiple types of social relationships and peer network characteristics; however, the study had several limitations. Primarily the study was cross-sectional in design which did not allow us to make inferences about the direction of associations in these results. Longitudinal research is necessary in order to examine these associations prospectively. Additionally, the measure of family support did not distinguish between support received from various family members. Because family support was a significant predictor of loneliness for middle adolescents, future research could benefit from examining how sibling relationships may be contributing to this effect. For example, Ponzetti and James (1997) found that sibling bonds were a significant predictor of loneliness in adolescence. Furthermore, Uruk & Demir (2010) demonstrated that communication was the most predictive facet of family structure in predicting loneliness. Future research could benefit from including measures

of perceived family support that assess which members of the family and which facets of the family structure (trust, intimacy, warmth) are most predictive of loneliness in adolescence.

The current study lacked measurement of peer network indices that warrant inclusion. Specifically, the friendship network activity measure in the current study only accounted for quantity of friends and did not allow us to consider the quality of the friendships reported. As demonstrated by previous research (Qualter et al., 2015), quality of friendships in middle adolescence is more strongly related to loneliness than quantity of friends. Furthermore, our measures of friendship network activity and popularity did not allow us to examine whether or not the friendships reported by our sample were mutual or reciprocated. Lodder, Scholte, Goossens, and Verhagen (2015) found that reciprocated friendships are more effective in reducing loneliness than friendships in which an outgoing nomination was not returned. The use of social network analysis would allow future research to more accurately measure and understand how peer network characteristics are differentially associated with loneliness.

The current study also lacked comprehensiveness in its measurement of romantic relationships. The measure we used only allowed for participants to indicate whether or not they were currently dating, and did not include assessment of the quality of or the satisfaction with the relationship. There is very little research on adolescent romantic relationships, but evidence suggests that emerging adults in romantic relationships that lack warmth, understanding, and quality experience greater levels of loneliness (Segrin, Powell, Givertz, & Brackin, 2003). Assessing the quality of the partnership would likely

reveal more about the potential loneliness-reducing effect of romantic relationships. Although there is little research on satisfaction with romantic relationships in adolescence, satisfaction with friendships in adolescence is associated with lower levels of loneliness (Uruk & Demir, 2002). Inclusion of a romantic relationship satisfaction measure would allow researchers to examine these associations in a more comprehensive manner. Lastly, our study did not assess the circumstances in which or reasons why participants were not dating. For example, an adolescent not dating because they are not interested in doing so may have different loneliness experiences than those of an adolescent who is not dating because their parents, culture, or religion does not allow them to. Because there are very few studies on adolescent romantic relationships, future research should aim to comprehensively measure romantic relationship quality, satisfaction with romantic relationships, and desires to or permissions to engage in dating to better understand how middle adolescents may benefit from dating in high school.

Conclusion

Our research further elucidated the importance of family support, friend support, and friendship network popularity in predicting loneliness in early and middle adolescence. In addition, the current study contributes to the research on how online peer support is related to loneliness in adolescence. Furthermore, our findings provided support for the propositions of the life-span model of loneliness (Qualter et al., 2015) in that family support is a greater source of loneliness for 6th graders than 9th graders. The findings of the current study also indicated that dating in early and middle adolescence is positively associated with loneliness and this relationship is stronger for middle

adolescents. The current study provided directions and recommendations for future research, as well as considered implications for clinical and school settings.

Understanding how social relationships and peer network characteristics are related to loneliness across adolescence will allow for intervention efforts to accurately target the varying sources of loneliness amid this population. Because loneliness is the most prevalent in adolescence compared to any other developmental time period (Heinrich & Gullone, 2006; Hawkley & Cacioppo, 2010), understanding its correlates is imperative for promoting health and wellness during this developmental time period.

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