A META-ANALYSIS OF FRIENDSHIP QUALITIES AND ROMANTIC RELATIONSHIP
OUTCOMES IN ADOLESCENCE (54 pp.)

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Romantic relationships are one of the most important interpersonal ties in adolescence.

Understanding how the social environment contributes to the formation and quality of these relationships is important. The current meta-analysis focuses on links between friendship quality and romantic relationship outcomes for adolescents up to 18 years of age. Specifically, I examined: (a) the strength of the relationship between friendship quality and romantic relationship involvement and quality, and (b) differences in qualities of friendships and romantic relationships. In a series of meta-analyses ($k = 28$ studies, N 's ranged from 946 to 4040), positive and negative friendship qualities were not related to romantic involvement. However, I did find robust evidence for continuity between positive and negative qualities in friendships and romantic relationships. The only difference between friendships and romantic relationships was that adolescents experienced more negative quality in their romantic relationships than in their friendships. These findings suggest that friendships have implications for adolescents' romantic relationships, although more research is needed on specific quality associations, and on the moderators and mediators of these relations.

Keywords: friendship quality, romantic relationship involvement, romantic relationship quality, adolescence

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by

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Introduction

Romantic relationships are one of the most important interpersonal ties in adolescence as they may set the stage for adult romantic relationships and be associated with outcomes such as sense of self-worth, mental health status, and well-being (Collins, 2003; Zimmer-Gembeck, 2002; Connolly et al., 2014; Collins & van Dulmen, 2006). Thus, understanding the factors that may contribute to the formation and quality of these relationships is important. Friends may be a particularly important source of influence on involvement in and the quality of romantic relationships (Collins & Laursen, 2004; Connolly & McIsaac, 2011; Collins & van Dulmen, 2006). Exploration of differences between friendships and romantic relationships is also important given that these relationships could fulfill different social needs (Collins, 2003). Although narrative reviews of friendship quality and romantic relationship involvement and quality are available, to my knowledge, no meta-analytic review exists and thus I endeavor to pursue two aims. The first was to explore continuity across close peer relationships by determining the strength of the relations between friendship quality and romantic relationship involvement and quality. The second was to explore differences in qualities of friendships and romantic relationships. I focused on adolescents up to 18 years as this age period captures the experiences of adolescents in their first romantic relationships and romantic relationships at this age may be distinct from those occurring later in emerging adulthood. Additionally, the history of friendship relationships that precedes the new social enterprise of romantic relationships makes the exploration of their association uniquely interesting during this period as friendships may serve as a model for newly emerging romantic relationships (Furman, 1999).

Friendship Quality and Romantic Relationship Involvement

Friendships are often cited as one of the primary sources of influence on adolescent romantic relationship outcomes. Harry Stack Sullivan (1953) emphasized that a major task of adolescence is to establish intimate relationships with those outside the family context to avoid loneliness. Adolescents who successfully build and maintain high quality friendships may have a greater capacity to form close relationships with other agemates (Collins & Laursen, 2000). Additionally, friends can provide a model and source of support for initiating later romantic relationships (Collins & van Dulmen, 2006). Friendships are also the first voluntary relationships with an agemate and provide an important context in which adolescents can learn about and practice the social skills necessary for forming and maintaining high quality romantic relationships such as support, reciprocity, companionship and intimacy (Furman 1999; Collins & Laursen, 2000; Kobak, Rosenthal, Zajac, & Madsen, 2007). Adolescents who are competent enough to maintain friendships with these features may be better able to build the foundations for development of their later romantic relationships (Furman 1999; Collins & Laursen, 2000; Kobak et al., 2007). In addition, discussions with close friends may increase the confidence needed to initiate contact with potential romantic partners and thus lay the groundwork for expectations of romantic involvement (Parker, Rubin, Erath, Wojslawowicz, & Buskirk, 2006).

Alternatively, there may be a compensatory explanation for romantic relationship involvement in adolescence. In the literature on parent-child relationships, it has been found that family stress and separation are risk factors for early romantic involvement (Furman & Collins, 2008). A similar pattern might emerge between friendships and romantic relationship involvement, such that those who have had negative experiences with friends—and thus, unmet needs for intimacy and companionship—who are motivated to seek out romantic relationships in

the hopes that a romantic partner will provide the sought-after support and comfort missing from their friendships. To my knowledge there has not yet been much theoretical discussion of this idea, however, a meta-analytic review can evaluate the empirical support for these two alternative theoretical predictions, as well as distinguish the circumstances under which either of these perspectives are supported (e.g., depends on age of adolescent).

Continuity between Friendship Quality and Romantic Relationship Quality

Sullivan's theory has been commonly cited as an explanation for potential associations between friendship quality and romantic relationship quality (Collins & van Dulmen, 2006). Within close friendships, adolescents may develop the capacity for intimacy, which is later necessary for maintaining high quality romantic relationships (Sullivan, 1953). Humans also may be predisposed to affiliate with peers because these relationships provide an opportunity for learning lessons of cooperation, collaboration, reciprocal altruism, and social play, which are thought to carry over into romantic relationships (Furman, 1999).

Narrative reviews generally agree that friendships and romantic relationships share similar features in that they develop within the context of the larger peer group, are voluntary relationships with agemates, and are horizontal or non-hierarchical in terms of power dynamics (Collins & van Dulmen, 2006; Furman & Collins, 2008; Collins & Laursen, 2004; Collins & Laursen, 2000). Friendships provide adolescents with a context in which to practice interactions and emotion management that may later serve as a prototype for romantic relationships (Furman & Collins, 2008; Collins & Laursen, 2004; Collins & Laursen, 2000). They also serve as models of social support (Furman & Collins, 2008) and influence expectations for future romantic relationships (Parker et al., 2006; Furman, 2002). The evidence is consistent with the idea that those who form close friendships are more likely to experience higher quality romantic

relationships when they do become romantically involved (Collins & van Dulmen, 2006; Connolly & McIsaac, 2011; Collins, Welsh, Furman, 2009; Furman & Collins, 2008; Parker et al., 2006; Collins & Steinberg, 2006).

Narrative reviews provide further support for continuities between friendship and romantic relationship qualities by focusing on links between specific, rather than more global, friendship and romantic relationship qualities. For example, there is empirical evidence that adolescents' experiences of support, secure-base and safe-haven behaviors, closeness, conflict resolution, and trust and openness with friends is mirrored in their romantic relationships (Connolly & McIsaac, 2011; Collins & Steinberg, 2006; Collins & Sroufe, 1999; Kobak et al., 2007). Conversely, negative friendship qualities such as aggression, victimization, or control are also mirrored in romantic relationships (Collins & Steinberg, 2006; Furman & Rose, 2015). I therefore expected to find continuity between the quality of friendships and romantic relationships for both positive and negative qualities.

Differences in Quality between Adolescents' Friendships and Romantic Relationships

A complete examination of the significance of friendships and romantic relationships should include not only an analysis of continuity between these two types of relationships, but also an analysis of their differences. While romantic relationships certainly share many of the same features as friendships, they are also considered distinct contexts in their own right and are not necessarily redundant (Collins, 2003). For example, several narrative reviews of early adolescence (ages 11 – 14 years) conclude that adolescents experience more intimacy or support in their friendships than in their romantic relationships, with romantic relationships at this age functioning more as a source of companionship or as a means of gaining status within the peer group (Zimmer-Gembeck, 2002; Collins & Steinberg, 2006; Furman, 2002; Collins & Laursen,

2004; Collins & Sroufe, 1999).

Around ages 15-17 years a shift is thought to occur, with adolescents developing greater interdependence with their romantic partner (Connolly & McIsaac, 2011). Indeed, there is empirical evidence that adolescents involved in serious romantic relationships report relying more on their romantic partners than their friends for companionship, intimacy and emotional support (Kuttler & LaGreca, 2004). Particularly by late adolescence, when romantic relationships become more salient, adolescents are less likely to indicate that friends help to serve attachment functions compared to romantic partners (Kobak et al. 2007). Furthermore, perceptions of intimacy and conflict resolution in romantic relationships are thought to rise to a level equal to what adolescents' experience in their friendships (Laursen, 1996; Collins & Sroufe, 1999), though perhaps friendships serve to satisfy affiliative needs whereas romantic partners may be more important for mutual sharing and emotional support (Collins & Sroufe, 1999).

To my knowledge, there has not been much attention to explanations for differences in negative qualities between friendships and romantic relationships. An exception is that adolescents report more conflict in their romantic relationships than in their friendships, which was attributed to either a greater willingness to risk conflict with those whom they are most closely tied or an increased level of comfort in acknowledging conflicts with romantic partners (Laursen, 1996). Thus, as romantic relationships increase in salience, so too might adolescents' experiences of negative qualities in these relationships. I explored differences in friendships and romantic relationship qualities, when the same measures are used, and tested potential moderators of these effects such as age.

The Current Study

Seventeen published narrative reviews have addressed connections between friendships

and romantic relationships, with nine acknowledging that friendship quality could influence both romantic relationship involvement and quality (Collins & Laursen, 2000; Collins, 2003; Collins & van Dulmen, 2006; Furman, 1999; Furman 2002; Furman & Shaffer, 2003; Furman & Collins, 2008; Kobak et al., 2007; Parker et al. 2006) and the rest only discussing the connections between friendship quality and romantic relationship quality (Connolly & McIsaac, 2011; Collins & Sroufe, 1999; Collins & Laursen, 2004; Collins & Steinberg, 2006; Collins et al., 2009; Furman & Rose, 2015; Laursen, 1996; Zimmer-Gembeck, 2002). Some of the reviews were limited to continuities or differences between specific qualities such as closeness, trust and openness, conflict resolution, and control (see Collins & Sroufe, 1999, Kobak, et al., 2007; and Furman & Rose, 2015, respectively) whereas others only mention associations on a more global level (see Collins & van Dulmen 2006; Collins et al., 2009; Furman & Collins, 2008; and Parker et al., 2006). Only a few explored the question of differences between friendship and romantic relationship quality (see Collins, 2003; Furman, 2002; Laursen, 1996; and Zimmer-Gembeck, 2002) or mention the possibility of both continuities and differences between friendships and romantic relationships (Collins & Sroufe, 1999; Kobak et al., 2007, Collins & Laursen, 2004; Collins & Steinberg, 2006).

The purpose of this meta-analytic review was first, to examine the strength of associations between friendship quality and romantic relationship involvement and quality, and second, to explore the differences in the levels of positive and negative qualities in friendships and romantic relationships for adolescents up to 18 years of age. I also explored moderators of these effects. For all analyses of relationship quality (be it friendships or romantic relationships), two distinctions were made. First, consistent with other narrative reviews (e.g., Connolly & McIsaac, 2011), I distinguish between positive and negative qualities. Second, I distinguished

between more general or aggregated measures of positive and negative quality (referred to here as global measures of positive or negative quality) and measures of specific positive and negative quality (e.g., intimacy or conflict). By conducting meta-analyses for both positive and negative qualities, at not only the global but also the specific level, I hope to capture a more complete picture of relationships in adolescence. Although I provide hypotheses below only for the qualities most commonly mentioned in relevant narrative reviews, I included other qualities that have been studied (e.g., companionship, ability to resolve conflict).

Regarding hypotheses, I do not have any specific predictions about the association of positive or negative friendship qualities with adolescent romantic relationship involvement given the different hypotheses. For the continuity analyses between friendship quality and romantic relationship quality, I predicted that friendship quality would beget romantic relationship quality, for both positive and negative qualities (e.g., adolescents who experience intimacy or conflict in their friendships will also experience these qualities in their romantic relationships).

I also expected to find some differences in the qualities of friendships and romantic relationships, although I expected these differences to be moderated by the age of the samples. Specifically, I hypothesized that samples of younger adolescents would experience more global positive quality in their friendships than their romantic relationships but by later in adolescence when romantic relationships become more salient, they will experience equal or perhaps even greater positive qualities in their romantic relationships. I did not have predictions for differences in negative quality between friendships and romantic relationships except for conflict which I hypothesized might occur more in romantic relationships than in friendships for older adolescents when romantic relationships become more interdependent.

Method

Published and unpublished studies were located by using PsycINFO, ProQuest, and reviewing reference lists of articles, as recommended by PRISMA guidelines (Moher, Liberati, Tetzlaff, & Altman, 2009). The stems of the following keywords in the abstract were used in separate or combined searches: *friend* or peer** in conjunction with *romantic*. This search was restricted to studies available on or before July 2017 that were written in English. Dissertations were included to be as representative as possible of the relevant data (Card, 2012). The search yielded 614 abstracts from electronic searches and an additional 17 studies from reference lists of articles included in the meta-analyses. Reference lists of published review articles were also reviewed, and four additional studies were found (see Figure 1).

Inclusion and Exclusion Criteria

Studies were included if they met the following criteria:

1. The study sample had an average age of 18 years or less and was a non-college sample.
2. The study assessed adolescents' friendship qualities. Studies focused on peer group variables such as likeability, popularity, victimization, or rejection were excluded. studies that assessed physical aggression, violence, or abuse in friendship were also excluded as they did not fit with my interest in normative adolescent friendship qualities.
3. The study assessed adolescents' romantic relationship involvement and/or romantic relationship quality for a current relationship or one that occurred in the last 18 months. I excluded studies that: (a) defined romantic involvement only as hanging out in a mixed-sex peer

group, group dating, or uncommitted dating; (b) asked adolescents not involved in a romantic relationship to imagine what their relationships would be like; (c) asked about general beliefs about romantic relationships; or (d) assessed sexual health, sexual attitudes, timing of first sexual involvement, or sexual activities (e.g., behaviors such as kissing).

4. The study included statistics that were estimates of effect size or could be transformed into an effect size (e.g., correlations, means and standard deviations). For six studies there was not sufficient information for the calculation of an effect size and corresponding authors were contacted but none replied with the necessary statistics, so these studies were excluded.

5. Studies were excluded if they did not include a typical developmental sample (e.g., sample included adolescents with developmental disorders such as autism).

To ensure independence of effect sizes, a protocol was created for selecting non-overlapping samples. First, overlapping samples were identified by cross-referencing authorship across multiple publications. If multiple papers existed for the same authors, the methods were examined to determine if the same sample was used. If a sample was included in more than one paper, the study with the largest sample size was selected. Additionally, peer-reviewed publications were favored over book chapters or dissertations. In total, after removing duplicates, I screened 624 abstracts, reviewed 80 full text articles, and found 28 studies (35 samples) that met the final inclusion criteria and were included in at least one meta-analysis (see Figure 1). Characteristics of included studies are in Table 1.

Coding of Studies

A standard coding guide was used to rate each study on measurement and design characteristics as well as on sample and source characteristics (based partially on recommendations from Card, 2012). The coding guide can be found in the Appendix.

Friendship quality. Friendship quality was defined as the “essential character or nature” (Kerns, 1996, p. 139) of the bond between two close peers. Since it is likely that individuals who report higher levels of one positive friendship feature also report higher levels of other positive features, it has been argued that all positive features are linked to one overarching dimension of friendship quality (Berndt, 2002). A similar argument has been made for negative friendship characteristics (Berndt, 2002). Thus, friendship quality can include *global measures of positive quality* (e.g., all positive qualities on a friendship quality measure) or *negative quality* (e.g., all negative qualities on a friendship quality measure). After coding for global positive and negative qualities I decided to also code specifically whether a study used the support and negative interaction composites from the Network of Relationships Inventory (NRI) as this measure was the most commonly used.

Friendship quality can also include specific positive and negative qualities that may be more or less salient across the age period. Thus, I included studies assessing specific qualities in separate meta-analyses for every individual friendship quality available. Unique positive qualities included: *companionship* (e.g., affiliation, recreation); *intimacy* (e.g., disclosure, affective bond, closeness); *security* (e.g., attachment security, reliable alliance); *validation and caring* (e.g., compliments, friend says nice things about person); *help and guidance* (e.g., instrumental aid, nurturance); and *ability to resolve conflict* (e.g., communal conflict strategies). Negative qualities included: *conflict* (e.g., antagonism, harshness, aggressive behaviors); *power* (e.g., control, inequities in relationship); *jealousy*; and *rivalry* (e.g., competition).

For both global and specific positive qualities, I also coded the type of friendship quality measure(s) as a questionnaire (e.g., adolescent report, friend report), an interview (e.g., interview with the adolescent and/or their friend), or an observation (e.g., trained coder observed dyadic

interactions between adolescent and friend). I also coded for age in years at which adolescents completed the measure of friendship quality.

Romantic relationship involvement and quality. Each romantic relationship variable was categorized into one of two domains: (a) romantic relationship involvement or (b) romantic relationship quality.

Romantic relationship involvement was conceptualized as the adolescent having a special or close romantic relationship with another person. I coded for type of involvement measure: questionnaire (e.g., adolescent report, romantic partner report), or interview (e.g., adolescent answered interview questions about romantic involvement). I also coded for whether the adolescent was involved in the romantic relationship currently or in the past 18 months.

Romantic relationship quality was conceptualized as the nature or characteristics of a romantic bond. I coded for romantic relationship qualities that were parallel to those selected for friendship quality, as well as for passion and commitment, two qualities that are described as important qualities of romantic relationships (Connolly & McIsaac, 2011). Thus, for romantic relationship quality I coded for global positive and global negative quality, as well as for the specific qualities of: companionship; intimacy; security; passion; commitment; validation and caring; help and guidance; ability to resolve conflict; conflict; power; jealousy and rivalry. I also coded the following variables as potential moderators: type of romantic relationship quality measure (questionnaire, interview, observation); age (in years) at which the adolescent filled out the measure of romantic relationship quality; and whether adolescents reported on the quality of a current (or past) romantic relationship.

Additional Moderators. In addition to coding for age and type of measure in friendships and romantic relationships, I also coded several other moderators to evaluate the generalizability

of my findings. These included: (a) publication year, to assess whether associations have changed over time; (b) study adolescents' ethnicity (percent Caucasian in sample); (c) study adolescents' gender (percent boys in sample); (d) socioeconomic status (SES; analyzed categorically as either low SES or not low SES); (e) study design (e.g., cross-sectional or longitudinal); (f) family status (percent intact families) and (g) region (United States/Canada/Europe; Mexico/Central America/South America; Australia; Asia; Africa). Due to sample sizes for the different analyses some moderators could only be evaluated in certain analyses.

Coding of Studies. The first author coded all studies; a random sample of 30% of included and excluded studies was double coded by an undergraduate research assistant to calculate reliability. Agreement was calculated using percentages, because kappa is not reliable with fewer than fifty studies (Card, 2012). Agreement between coders was 100% for all categories, except for percent intact families, percent Caucasian, and type of romantic quality for which there was 85% agreement, and type of friendship quality, for which there was 71% agreement. All discrepancies were resolved between coders (see Appendix for codebook).

Effect Size Calculation

Effect sizes were calculated and analyzed using Comprehensive Meta-Analysis (Version 2.0) software (Borenstein, Rothstein, & Cohen, 2005). Calculations were based on a random effects model, rather than a fixed effects model, as the random effects model acknowledges there may be variance in the true effect size from study to study (Hedges, & Olkin, 1985). The studies in the meta-analyses are assumed to be a random sample of the distribution of these true effect sizes and the overall effect for each meta-analysis is an estimate of the mean effect of this distribution (Borenstein, Hedges, Higgins, & Rothstein, 2009). Heterogeneity of effect sizes was formally assessed using Q-statistics (Borenstein, et al., 2009) and evaluating the significance of

moderators when significant heterogeneity was found.

For continuity analyses, Pearson's r 's were analyzed; if other statistical effect sizes were reported (e.g., t -tests) they were converted to r using the Comprehensive Meta-Analysis program. For differences analyses, I calculated a within-study standardized mean difference, otherwise known as g -change scores. This was done to account for the dependence in friendship and romantic relationship quality means that occurs because the same group of adolescents completed the friendship and romantic relationship measures in each study (N. A. Card, personal communication, December 7th, 2017). The tests of mean difference for within-subjects data reflected the standardized difference in means between quality in friendships (mean 1) and quality in romantic relationships (mean 2); thus, the effect size (mean 2 – mean 1) will be positive if adolescents report more of a particular quality in their romantic relationships, and negative if adolescents report more of a particular quality in their friendships. Significantly, because of the need to use this method of effect size calculation, I was only able to include studies in the differences analyses that also provided a correlation (and means and standard deviations) for friendship quality and romantic relationship quality since the correlation is needed for the standard error calculation.

Multiple analyses were conducted to distinguish among the relationship constructs, and therefore it was possible for a study to contribute to more than one meta-analysis (e.g., studies that measured both positive and negative qualities were included in both of those analyses). In cases where a study generated more than one effect size for a given analysis, several rules were applied to ensure the inclusion of a single effect size for each study in the relevant meta-analysis:

1. If a study included more than one measure of friendship quality or romantic relationship quality that were not aggregated for analysis (e.g., two different self-report questionnaires),

effect sizes were aggregated across measures.

2. If a study involved multiple measures of friendship or romantic relationship quality, but not the same type of measure (e.g., one questionnaire measure and one interview measure), non-questionnaire measures were given preference as they were less commonly used.
3. When effect size data were available from multiple waves of longitudinal studies, friendship data were taken from the first available wave, whereas romantic relationship data was taken from the second available wave. This was done to analyze study design as a moderator (cross-sectional or longitudinal).
4. When studies provided separate data for boys and girls (e.g., Keener, 2010), or different ethnic groups (e.g., Ha, Overbeek, de Greef, Scholte, & Engels, 2010) or separate results for various groups within a study (e.g., health status; Seiffge-Krenke, 2000), effect sizes were calculated for each group and entered into the relevant meta-analyses separately rather than aggregated.
5. If a study grouped adolescents by duration of romantic relationship (e.g., Connolly & Johnson, 1996), or by seriousness of the relationship (e.g., Kuttler & LaGreca, 2004) only effect size information for the longest lasting, and most serious relationships was used.
6. When effect sizes were aggregated for the friendship quality and romantic involvement analyses and for the analyses of friendship and romantic relationship quality, a Fischer's r -to- z transformation was applied to each effect size, effects were averaged, and then converted back to a correlation prior to analysis.
7. For the difference analyses, means and standard deviations, as well as the necessary correlations, were aggregated according to rules 1-5 above prior to calculating a Hedges's g for the difference between friendship and romantic relationship quality.

Data Analysis

The first series of meta-analyses were conducted to examine the relations between friendship quality and romantic relationship involvement. Second, I examined continuity between friendship quality and romantic relationship quality. Third, I explored differences in friendship quality and romantic relationship quality. Moderator analyses were conducted when significant heterogeneity of effect sizes was found. In addition, consistent with recommendations by Card (2012), I only tested a specific moderator if there were four or more samples available. The continuous moderators that could be tested for every analysis included percent Caucasian, gender (percent boy), percent intact families, and age at friendship measure and age at romantic relationship measure; these were tested with a meta-regression technique. Study design was the only categorical moderator that could be tested for every analysis, and this was done using a grouped analysis. I note if I could not test one of these moderators for a particular analysis in the results section below. Due to a lack of variability, the following coded moderators could not be analyzed: type of friendship measure, type of romantic relationship measure, SES, region of the world, and whether the adolescent was currently involved in a romantic relationship.

To test and correct for publication bias, I used the Duval and Tweedie (2000) trim-and-fill procedure which derives a funnel plot to show the association between sample size and effect size. When publication bias is not present, the plot is shaped as an inverted funnel, with effect sizes distributed symmetrically around the combined effect sizes. When publication bias is present, and the expected effect size is positive, fewer studies than expected are found in the bottom left side of the mean effect size (Borenstein et al., 2009). If more studies with smaller samples are located to the right of the mean, the funnel plot is considered symmetrically unmatched. The trim-and-fill procedure then enters symmetrical extreme values to balance the plot and the observed and computed effect sizes are then used to derive an adjusted effect size.

Results

Associations of Friendship Quality and Romantic Relationship Involvement

Positive friendship quality and romantic relationship involvement. I first tested whether higher levels of positive friendship quality are related to greater romantic relationship involvement. The meta-analysis ($k = 9$ samples, $N = 1898$) yielded a non-significant overall effect size of $r = .04$ (see Table 2). The trim-and-fill approach indicated publication bias was unlikely. There was significant heterogeneity in effect sizes, but no significant moderators were found to explain this heterogeneity. Study design was not able to be tested as a moderator as all but two samples used cross-sectional data.

A similar meta-analysis was conducted to test whether higher levels of positive quality measured by the NRI – Support composite are related to greater romantic relationship involvement. The meta-analysis ($k = 4$ samples, $N = 1154$) yielded a non-significant overall effect size of $r = .04$ (see Table 2). The trim-and-fill approach indicated publication was unlikely. There was significant heterogeneity in effect sizes, but no significant moderators (I was unable to test study design, percent intact, or percent Caucasian as moderators).

Negative friendship quality and romantic relationship involvement. I also tested whether higher levels of negative friendship quality are related to greater romantic relationship involvement. The meta-analysis ($k = 5$ samples, $N = 946$) yielded a non-significant overall effect size of $r = -.004$ (see Table 2). The trim-and-fill approach indicated publication bias was unlikely. No significant heterogeneity in effect sizes was found.

Associations of Friendship Quality and Romantic Relationship Quality

Global positive quality. Next, I tested whether there is continuity in global positive quality between adolescents' friendships and romantic relationships. The meta-analysis ($k = 23$ samples; $N = 4040$) yielded a significant overall effect size of $r = .16$ (see Table 3). The classic fail-safe N indicated that 498 additional non-significant studies would be needed to bring the p -value to greater than the alpha. The trim-and-fill approach indicated publication bias was likely. After imputing the missing studies, the effect size was $r = .14$. There was significant heterogeneity of effect sizes, but no significant moderators were found.

I also tested the hypothesis of continuity in global positive quality in a meta-analysis that included only samples that used the NRI - Support composite. The meta-analysis ($k = 9$ samples; $N = 1099$) yielded a significant overall effect size of $r = .21$ (see Table 3). The classic fail-safe N indicated 131 additional non-significant studies would be needed. The trim-and-fill approach indicated publication bias was unlikely. The test of homogeneity was not significant.

Specific positive qualities. I then tested whether there is continuity in specific positive qualities between friendships and romantic relationships. For intimacy, the meta-analysis ($k = 9$ samples, $N = 1933$), yielded a significant overall effect size of $r = .21$ (see Table 3). The classic fail-safe N indicated that 142 additional non-significant studies would be needed, and the trim-and-fill approach indicated that publication bias was unlikely. The test of homogeneity was significant. I tested all moderators, but only study design was significant ($Q_{within} = 4.35$, $p = .04$; 95% CI .08 to .28), such that longitudinal designs ($k = 4$; $Q_{between} = 10.70$, $p < .05$) had stronger effect sizes than cross-sectional designs ($k = 5$; $Q_{between} = 16.28$, $p < .01$).

Following a similar pattern, the meta-analysis for security ($k = 4$ samples, $N = 1218$) yielded a significant overall effect size of $r = .14$ (see Table 3). The classic fail-safe N indicated 16 non-significant studies would be needed, and the trim-and-fill approach indicated that

publication bias was likely. After imputing the missing studies, the effect size was $r = .12$. The test of homogeneity was not significant.

Global negative quality. Subsequently, I tested the hypothesis that there is continuity in global negative quality between adolescents' friendships and romantic relationships. This meta-analysis ($k = 18$ samples, $N = 2944$) yielded a significant overall effect size of $r = .32$ (see Table 3). The classic fail-safe N indicated that 1198 additional non-significant studies would be needed. The trim-and-fill approach indicated publication bias was unlikely. The test of homogeneity was significant. I examined all moderators and found that more recently published samples had smaller effect sizes than samples that were published longer ago (slope point estimate = $-.02$, $p = .04$). Age at friendship measure was also significant, such that samples with older adolescents had larger effect sizes (slope point estimate = $.05$, $p = .02$).

I also tested the hypothesis of continuity in global negative quality in a meta-analysis that included only samples using the NRI – Negative Interactions composite. The meta-analysis ($k = 7$ samples; $N = 971$), yielded a significant overall effect size of $r = .39$ (see Table 3). The classic fail-safe N indicated 225 additional non-significant studies would be needed. The trim-and-fill approach indicated publication bias was unlikely. The test of homogeneity was not significant.

Specific negative qualities. Next, I tested the hypothesis that specific negative qualities in friendship are associated with those same specific qualities in romantic relationships. The meta-analysis on conflict ($k = 10$, $N = 1548$) yielded a significant overall effect size of $r = .28$ (see Table 3). The classic fail-safe N indicated an additional 223 non-significant studies would be needed. The trim-and-fill approach indicated that publication bias was unlikely. The test of homogeneity was significant. I tested all moderators, except study design (all but two samples used cross-sectional data) and percent intact (all but three samples did not provide data), but

none were significant.

Perusal of the continuity analysis effect sizes and associated nonoverlapping confidence intervals revealed that correlations appeared to be stronger for the negative quality meta-analyses than for the positive quality analyses. Thus, using the Fisher *r*-to-*z* transformation for comparing independent correlations I calculated a value of *z* to assess the significance of the difference between the correlation for global negative quality and the correlation for global positive quality.¹ This analysis was significant indicating the effect for negative quality was indeed larger than the effect for global positive quality ($z = -7.02, p < .001$).²

Differences between Friendship Quality and Romantic Relationship Quality

Global positive quality differences. I next conducted a meta-analysis to test the hypothesis that adolescents experience more global positive quality in their friendships in early adolescence, but by late adolescence, when romantic relationships become more salient, they

¹ I was unable to conduct the Steiger test of correlated correlations as data were not available for all necessary relations (e.g., data were not provided for the association between positive friendship quality and negative romantic relationship quality).

² I also conducted a Fisher's *r*-to-*z* comparison using only studies that provided effect sizes for both the relation between positive ($r = .21$) and negative ($r = .35$) friendship and romantic relationship quality ($k = 13$ samples, $N = 2159$). This was done to clarify whether the apparent difference in effect sizes was due to something about the nature of positive versus negative qualities or due to the nature of the samples included in the analyses. This analysis yielded a $z = -5.02, p < .001$ indicating that the effect for global negative quality was still significantly larger than the effect for global positive quality.

experience equal, or perhaps even greater, amounts of global positive quality in their romantic relationships. This meta-analysis ($k = 15$ samples, $N = 3281$) yielded a non-significant overall effect size of Hedges's $g = -.15$ (which was equivalent to a correlation of $r = -.07$; see Table 4). The trim-and-fill approach indicated that publication bias was unlikely. The test of homogeneity was significant. I examined all moderators and found that year and study design were significant. More recently published samples had smaller effect sizes than samples that were published longer ago (slope point estimate = $-.08$, $p = .007$). Cross-sectional designs ($k = 10$; $Q_{between} = 1119.46$, $p < .001$) had stronger effect sizes than longitudinal designs ($k = 5$; $Q_{between} = 33.71$, $p < .001$). Contrary to hypotheses, age at friendship measure was not significant (slope point estimate = $-.12$, $p = .53$), and age at romantic relationship measure was not significant (slope point estimate = $.05$, $p = .88$).

The meta-analysis conducted to test differences in positive qualities between adolescent romantic relationships and friendships using only samples that used the NRI – Support composite ($k = 10$ samples, $N = 1993$) also yielded a non-significant overall effect size of Hedges's $g = .01$ (which was equivalent to a correlation of $r = .006$; see Table 4). The trim-and-fill approach indicated that publication bias was unlikely. The test of homogeneity was significant. I examined all moderators, except study design (all but 3 samples used cross-sectional data), and found that year was significant, such that more recently published samples had smaller effect sizes than samples that were published longer ago (slope point estimate = $-.03$, $p = .001$). Neither age at friendship measure (slope point estimate = $-.09$, $p = .50$) nor age at romantic relationship measure was significant (slope point estimate = $-.06$, $p = .81$).

Specific positive quality differences. Although I was interested in exploring specific positive quality differences between adolescents' friendships and romantic relationships, I could

not do so because less than four samples provided data relevant to these analyses (see Table 4).

Global negative quality differences. I next conducted a meta-analysis to test whether adolescents report more global negative quality in their romantic relationships or their friendships. This meta-analysis ($k = 14$ samples, $N = 2675$) yielded a significant overall effect size of Hedges's $g = .15$ ($r = .07$; see Table 4) indicating that adolescents report experiencing more global negative quality in their romantic relationships than their friendships. The classic fail-safe N indicated that 61 additional non-significant studies would be needed to bring the p -value to greater than the alpha. The trim-and-fill approach indicated that publication bias was unlikely. The test of homogeneity was significant. I tested all moderators, including age at friendship measure (slope point estimate = $.03$, $p = .67$) and age at romantic relationship measure (slope point estimate = $.06$, $p = .61$), but none were significant.

I also conducted a meta-analysis to test whether adolescents report more negative qualities in their romantic relationships or in their friendships using only samples that used the NRI – Negative Interactions composite. This meta-analysis ($k = 8$ samples, $N = 1382$) yielded a non-significant overall effect size of Hedges's $g = .14$ (which was equivalent to a correlation of $r = .07$; see Table 4). The trim-and-fill approach indicated publication bias was unlikely. The test of homogeneity was significant. I examined all moderators, except for percent intact (only three samples provided data) and study design (all but three samples used cross-sectional data). However, none of the moderators, including age at friendship measure (slope point estimate = $.04$, $p = .43$) and age at romantic relationship measure (slope point estimate = $.06$, $p = .52$), were significant.

Specific negative quality differences. To test the hypothesis that adolescents report more conflict in their romantic relationships than their friendships over the course of

adolescence, I conducted a meta-analysis on *conflict differences*. This meta-analysis ($k = 7$ samples, $N = 1206$) yielded a non-significant overall effect size of Hedges's $g = .04$ (which was equivalent to a correlation of $r = .02$; see Table 4). The trim-and-fill approach indicated that publication bias was unlikely. The test of homogeneity was significant. I examined all moderators, except for percent intact (only one sample provided data), study design (all samples used cross-sectional data), and found that year was significant, such that more recently published samples had smaller effect sizes than samples that were published longer ago (slope point estimate = $-.03$, $p = .03$). Gender (percent boy) was also significant, such that samples with a greater percentage of boys had smaller effect sizes than samples with smaller percentages of boys (slope point estimate = $-.002$, $p = .03$). Age at friendship measure (slope point estimate = $.01$, $p = .97$), and age at romantic relationship measure (slope point estimate = $.01$, $p = .97$) were not significant.

Discussion

The purpose of this meta-analytic review was, first, to determine the strength of the relation between friendship quality and romantic relationship involvement and quality, and second, to explore differences in friendships and romantic relationship qualities in adolescence. I did not find an association between positive or negative friendship quality and romantic relationship involvement. However, there was substantial evidence of an association between friendship quality and romantic relationship quality. I found no significant differences in positive quality between friendships and romantic relationships; however, adolescents did report experiencing more negative quality in their romantic relationships than in their friendships. Although I planned to examine both global and specific measures of relationship quality, for some analyses this paper was limited to the study of global qualities due to a small number of studies with data on specific qualities. Moderator analyses showed that age at friendship measure, study design, gender (percent boy), and year explained some of the heterogeneity of the effects, though interpretations should be made with caution given there were 11 meta-analyses with significant heterogeneity for which I tested moderators and relatively few significant moderators were found.

Friendship Quality and Romantic Relationship Involvement

None of the meta-analyses on friendship quality and romantic relationship involvement were significant. Furthermore, although there was significant heterogeneity in the meta-analyses for global positive friendship quality (all studies; NRI-Support only) and romantic involvement, none of the moderators I tested could explain this heterogeneity. These findings do not provide

support for either of the two predominant predictions from narrative reviews that: (1) friendships are a model and source of support for initiating subsequent romantic relationships (Collins & van Dulmen, 2006) and a context that allows adolescents to learn about and practice social skills necessary for developing subsequent romantic relationships (Furman, 1999; Collins & Laursen, 2000; Kobak et al., 2007), and therefore adolescents in higher quality friendships will be more likely to be involved in romantic relationships; or (2) adolescents with negative experiences in friendships may be motivated to seek out romantic relationships in order to fulfill unmet needs for intimacy and companionship, just as those with low quality parent-child relationships also seek early romantic involvement (Furman & Collins, 2008).

It is possible that it is not global, but rather specific positive or negative friendship qualities that would relate more strongly to romantic involvement. Narrative reviews indicate that friendships, as the first *intimate* and voluntary relationships, can provide a template for subsequent close relationships (Collins & Laursen, 2000). Additionally, Sullivan's theory highlights the importance of establishing intimate relationships to overcome loneliness. As for the negative domain, the most common qualities included in the global negative friendship quality and romantic involvement meta-analysis were conflict, antagonism, criticism, pressure, dominance, exclusion and relative power. As shown in Table 2, there are some studies of specific positive qualities including intimacy, as well as some studies of conflict, but currently there are too few studies to draw conclusions.

Alternatively, other aspects of the adolescents' peer world may be more strongly related to their romantic relationship involvement than friendship quality. Popular adolescents are more likely to be involved in romantic relationships (e.g., Carlson & Rose, 2007). Additionally, early involvement in romantic relationships is often predicted by early pubertal development,

particularly for adolescent girls (e.g., Kochendorfer & Kerns, 2017), and adolescents' associations with older peers, who often are involved romantically themselves (Friedlander, Connolly, Pepler, & Craig, 2007). Thus, further exploration into the contexts in which adolescents' friendships and romantic relationships develop may be a key area for future research. Although I did not find age as a moderator of the relation between friendship quality and romantic involvement, it is possible that it would moderate the relation between popularity and involvement (Connolly & McIsaac, 2011).

Continuity in Friendship Quality and Romantic Relationship Quality

The meta-analyses for continuity supported my hypotheses, with significant effect sizes for all positive and negative qualities tested (Global Positive Quality; NRI-Support only; Intimacy; Security; Global Negative Quality; NRI – Negative Interactions; Conflict). These results provide robust, quantitative evidence for continuity between friendship quality and romantic relationship quality. These findings also support narrative reviews which emphasize that adolescents who competently navigate the peer world to form lasting, high quality friendships who are more likely to experience higher quality romantic relationships when they do become romantically involved (Collins & van Dulmen, 2006; Connolly & McIsaac, 2011; Collins et al., 2009; Furman & Collins, 2009; Parker et al., 2006; Collins & Steinberg, 2006).

Narrative reviews have proposed various mechanisms that might account for why these associations occur. One such mechanism is the adolescent's internal working model, or their expectations of self and other in close relationships (Collins & Sroufe, 1999). The similar features of friendships and romantic relationships may lead to a carryover of expectations for relationships from one to the other (Collins & Sroufe, 1999, Furman, 1999, Collins & van Dulmen, 2006). Another proposed mechanism is the adolescent's social competence. Given that

the social skills necessary for achieving high quality friendships are similar to those needed for high quality romantic relationships (e.g., emotion regulation; conflict resolution), adolescents' competence with these skills may account for the association between friendship and romantic relationship quality (Collins & Sroufe, 1999; Connolly, Furman, & Konarski, 2000, Kobak, et al., 2007). It has also been proposed that close friendships help support social- and self-identity development, which in turn might support later romantic relationships (Zimmer-Gembeck, 2002). Additionally, genetically influenced traits, such as temperament, may also influence both friendship and romantic relationship quality. Coplan & Bullock (2012) proposed that temperament may influence a variety of relevant peer group processes including the adolescent's: (1) desire to approach or avoid peers, (2) affective experiences (e.g., anger), and (3) the social cognitions regarding relationships, such as rejection sensitivity or attribution biases. Adolescents who are happy and approach and enjoy social interactions may be better able to navigate social exchanges and initiate and maintain social interactions with both friends and romantic partners (see Coplan & Bullock, 2012 for a review of these relations).

Interestingly, negative qualities in friendships and romantic relationships were more strongly associated than were positive qualities. Perhaps this indicates that adolescents more selectively store and retrieve memories of negative relationship experiences than positive experiences and therefore negative interaction patterns with friends may be more likely to carry over to and influence later relationships (Bower & Cohen, 1982). Additionally, drawing on Gottman's idea of a five-to-one ratio of positive to negative experiences as necessary for satisfying marital relationships (e.g., Gottman, 2014), perhaps negative experiences are simply more salient and thus have more of an impact on future relationships.

Differences between Friendship Quality and Romantic Relationship Quality

No significant differences were found between friendships and romantic relationships for global positive quality or for NRI – Support. Unfortunately, due to the small number of studies with available data on specific positive qualities, I did not have enough power to interpret findings for specific positive qualities. Narrative reviews posit that adolescents experience more intimacy or support in their friendships in early adolescence (ages 11-14 years), but around ages 15-17 years this shifts such that levels of intimacy or support in friendships and romantic relationships are equivalent, or perhaps even greater in romantic relationships (Collins & Steinberg, 2006; Furman, 2002; Collins & Laursen, 2004; Collins & Sroufe, 1999). Yet surprisingly I did not find age to be a significant moderator. This may indicate that adolescents' friendships and romantic relationships are more similar than different in terms of what they qualitatively provide, at least for adolescents below age 18 years. This idea is particularly supported by the finding that romantic relationships were not less utilized for these qualities than friendships. The lack of age moderation may also indicate a need to include emerging adulthood samples to see whether the hypothesized reversal from experiencing various qualities more in friendships than in romantic relationships emerges in older ages.

Interestingly, adolescents did report experiencing more global negative quality in their romantic relationships than in their friendships. It is possible that the features of romantic relationships that separate them from friendships would explain this difference. For example, romantic relationships are distinct from friendships in that they are defined by “intense love, attraction and longing for another person” (Connolly & McIsaac, 2011, p. 188). It is possible this unique intensity leads to higher levels of negative quality because adolescents are more invested in the relationship, and thus feel they have more to lose. Additionally, it would be interesting to explore whether adolescents report experiencing higher levels of negative interactions in their

romantic relationships because they have higher standards for those relationships than their friendships. Perhaps adolescents compare their romantic relationships to the marital relationships modeled by their parents, or to those relationships (real or otherwise) modeled in popular culture and develop unrealistic expectations of their current romantic relationship.

Although Laursen (1996) predicted adolescents would experience a decline in conflict in their friendships and an increase in conflict in their romantic relationships, I did not find differences for conflict. Laursen (1996) did make the point that across the adolescent years, “greater costs – more frequent conflicts – are associated with involuntary than with voluntary communal relationships” (Laursen, 1996, p. 194) indicating that perhaps age moderation for conflict would only occur for adolescents who are in longer term (and thus, less voluntary and more interdependent) romantic relationships (Laursen, Hartup & Koplas, 1996). Future work will need to explore this possibility. The significant difference in global negative quality points to other negative qualities that may be more important. It is possible that adolescents experience more negative interactions from qualities other than conflict such as jealousy or power dynamics. I was interested in exploring other specific negative quality variables besides conflict but was unable to do so due to a lack of studies. Future work should endeavor to compare friendships and romantic relationships in terms of other specific negative qualities.

Limitations and Future Directions

Initially, I had intended to also examine the connection between sibling relationship quality and romantic relationship outcomes. Sibling relationships are the longest-lasting agemate relationship, and the first peer context in which individuals can practice the social skills necessary for forming and maintaining romantic relationships (Doughty, McHale, & Feinberg, 2015). Thus, I felt it would be beneficial for our understanding of the connections between close

peer relationships to include sibling relationship quality. The literature search yielded only two studies with relevant data, both of which examined continuity in negative quality (one also examined continuity in positive quality) between sibling and romantic relationships. Empirical work is needed to explore how sibling quality might relate to romantic relationship involvement and quality, particularly given arguments that sibling relationships and romantic relationships should be related (e.g., Updegraff, McHale, & Crouter, 2002; Doughty et al., 2015).

Additionally, it is unfortunate that the conclusions I am able to draw from this meta-analytic review center primarily around aggregated measures of positive or negative friendship quality and romantic relationship quality. With the exception of intimacy, security, and conflict in the continuity analyses, and conflict in the differences analyses, the analyses of other specific qualities of interest were too underpowered to draw reliable conclusions. Given evidence from narrative reviews that underscore the importance of exploring specific qualities (Connolly et al., 2014; Collins & Steinberg, 2006; Collins & Sroufe, 1999), it is imperative future work pursue this endeavor. Furthermore, conclusions are limited to friendship quality and romantic relationship outcomes that were measured primarily with self-report questionnaires. The use of interview or observational measures was relatively rare, and as such, I was unable to analyze type of friendship measure or type of romantic relationship measure as a moderator. Measurement of quality using observational methods would be an addition as these measures could capture the perspective of both members of the dyad.

Studies used in the current meta-analysis focused on the direct relation and moderators of friendship quality and romantic relationship outcomes. I did not explore the influence of potential mediating variables. One example of such a mediating mechanism could include shyness. Empirical work in emerging adulthood shows that individuals who are shy experience

lower quality relationships with friends and romantic partners (Nelson, Padilla-Walker, Badger, Barry, Carroll, & Madsen, 2008) and are more likely to stay in low quality relationships rather than seek another new partner (Nelson et al., 2008). Future work could test whether shyness, or other variables, mediates any of the other positive or negative quality associations. In addition, future work could explore how these findings may differ across different ecological contexts. The majority of included studies were conducted in the United States, Canada, or Europe; thus, I was unable to explore region of the world as a moderator or draw any conclusions about the influence of culture. It is possible that different qualities of friendships and romantic relationships would be more or less associated in different regions due to differing cultural expectations. For example, instrumental aid has been highlighted as an important quality in the friendships of individuals from group-oriented cultures whereas intimacy has been less emphasized (Chen, Chung, Hsiao, 2009). Additionally, work is needed in the area of non-heterosexual romantic relationships. These data were included in the present meta-analysis but could not be separately analyzed due to a lack of studies.

In conclusion, this meta-analysis revealed that: (a) friendship quality is not associated with romantic involvement; (b) friendship quality is associated with romantic relationship quality; and (c) adolescents report experiencing more negative qualities in their romantic relationships than in their friendships. This meta-analysis also highlighted the need for more studies examining specific friendship qualities and romantic relationship outcomes. This work could be extended by considering peer group variables (e.g., popularity) and romantic involvement, mechanisms of the associations between friendship and romantic relationship quality, explanations for why negative quality associations are stronger than positive quality associations, and how these findings may vary across different measures and ecological contexts.

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Table 1

Studies included in the meta-analyses

Study Authors	Sample <i>N</i>	Age at Friend/ Romantic Measure	Name of Friendship Measure ^a	Type/Source of Friendship/ Romantic Measure ^b	Relationship Construct	Question Assessed ^c	Study Design ^d
Ames & Leadbeater (2017)	80 Boys 93 Girls	<i>M</i> =12.5 years; <i>M</i> =12.5 years	9-item PSS-Fr	Q/Q; Adolescent/Adolescent	Global Pos.	Involv.	CS
Blais et al. (2008)	884	<i>M</i> =15 years; <i>M</i> =15 years	NRI; IPPA	Q/Q; Adolescent/Adolescent	Global Pos.; Intimacy; Security; Global Neg.; Conflict	C; Specific C; D; Specific D	CS
Chow et al. (2015)	110	<i>M</i> =17.6 years; <i>M</i> =17.6 years	NRI	Q/Q; Adolescent/Adolescent	Global Pos.; Security	C; Specific C	CS
Connolly et al. (2000)	52	<i>M</i> =14.82 years; <i>M</i> =15.82 years	NRI	Q/Q; Adolescent/Adolescent	Global Pos.; NRI – Support; Global Neg.; NRI – Negative	C; D	L
Connolly & Johnson (1996)	730	<i>M</i> =16.28 years; <i>M</i> =16.28 years	NRI	Q/Q; Adolescent/Adolescent	Global Pos.; NRI – Support	Involv.; D	CS
Doyle et al. (2009)	156	<i>M</i> =15.77 years; <i>M</i> =17.77 years	RQ	Q/Q; Adolescent/Adolescent	Global Pos.; Security; Global Neg.; Insecurity	C; Specific C; D; Specific D	L
Furman & Shomaker (2008)	32	<i>M</i> =15.45 years; <i>M</i> =15.45 years	IDCS; NRI	Q, O/Q, O; Adolescent/Adolescent	Global Pos.; Global Neg.; NRI– Negative;	C; Specific C; D; Specific D	CS

Furman et al. (2002)	68	16-19 years; 16-19 years	BSQ	Q/Q; Adolescent/Adolescent	Conflict NRI– Negative; Security	C; Specific C	CS
Ha et al. (2010)	444 Indigenous 269 Ethnic	<i>M</i> =14.94 years; <i>M</i> =14.94 years	Investment Model Scale	Q/Q; Adolescent/Adolescent	Global Pos.; Intimacy; Commitment	C; Specific C	CS
Hebert et al. (2013)	314	<i>M</i> =16.25 years; <i>M</i> =16.25 years	NRI	Q/Q; Adolescent/Adolescent	Global Pos.; NRI – Support	C; D	CS
Jimenez (2001)	212	<i>M</i> =16.11 years; <i>M</i> =16.11 years	IAA	Q/Q; Adolescent/Adolescent	Global Neg.; Insecurity	C; D; Specific D	CS
Joo (2005)	94	<i>M</i> =17.15 years; <i>M</i> =15.15 years	IPPA;	Q/Q; Adolescent/Adolescent	Global Pos.; Global Neg.	Involv.; Specific Involv.	CS
Kansky (2016)	184	<i>M</i> =14.27 years; <i>M</i> =14.27 years	IPPA	Q/Q; Friend/ Adolescent	Global Neg.; Conflict	C; Specific C	CS
Keener (2010)	49 Boys 59 Girls	<i>M</i> =15.79 years; <i>M</i> =15.79 years	Peer Conflict Questionnaire	Q/Q; Adolescent/Adolescent	Global Pos.; Global Neg.; Ability to Resolve Conflict; Conflict	C; Specific C; D; Specific D	CS
Kochendorfer & Kerns (2017)	110 Boys 68 Girls	<i>M</i> =10 years; <i>M</i> =12 years	FQQ	Q/Q; Adolescent/Adolescent	Global Pos.; Intimacy; Global Neg.; Conflict	Involv.; Specific Involv.; C; Specific C	L
Kuttler & LaGreca (2004)	185	<i>M</i> =16.79 years; <i>M</i> =16.79 years	NRI-R	Q/Q; Adolescent/Adolescent	Global Pos.; Global Neg.	Involv.; Specific Involv.	CS
LaGreca & Mackey (2007)	433	<i>M</i> =16.6 years; <i>M</i> =16.6 years	NRI-R	Q/Q; Adolescent/Adolescent	Global Pos.; NRI – Support; Global Neg.; NRI – Negative	C; D	CS
Laursen et al.	141	<i>M</i> =15.3 years;	NRI – BSV	Q/Q;	Global Pos.;	C; D	L

(2006) Miller (2001)	34 Data Set A 26 Data Set B	<i>M</i> =17.3 years <i>M</i> =15.99 years; <i>M</i> =15.99 years	NRI; ASBS	Adolescent/Adolescent Q/Q; Adolescent/Adolescent	NRI – Support Global Pos.; NRI – Support; Global Neg.; NRI – Negative; Conflict	C; Specific C; D; Specific D	CS
Moretti (2006)	49 Boys 63 Girls	<i>M</i> =15.4 years; <i>M</i> =15.4 years	CTS	Q/Q; Adolescent/Adolescent	Global Neg.; Conflict	C; Specific C	CS
Murphy (2008)	93	<i>M</i> =16.04 years; <i>M</i> =16.04 years	NRI	Q/Q; Adolescent/Adolescent	Global Pos.; NRI – Support; Global Neg.; NRI – Negative	Involv.; C; D	CS
Mylecraine (2012)	39	<i>M</i> =16 years; <i>M</i> =16 years	FJQ	Q/Q; Adolescent/Adolescent	Global Neg.	C	CS
Pagano & Hirsch (2007)	102	<i>M</i> =16 years; <i>M</i> =16 years	Interpersonal Characteristics Interview	I	Global Pos.; Intimacy; Global Neg.; Conflict	C; Specific C; D; Specific D	CS
Puckett (2009)	317	<i>M</i> =13.95 years; <i>M</i> =14.95 years	NRI	Q/Q; Adolescent/Adolescent	Global Neg.; NRI – Negative	C; D	L
Seiffge- Krenke (2000)	91 Diabetic 107 Healthy	<i>M</i> =13.9 years; <i>M</i> =14.9 years	NRI	Q/Q; Adolescent/Adolescent	Global Pos.; Intimacy	C; Specific C; D; Specific D	L
Seiffge- Krenke (2003)	58	<i>M</i> =13 years; <i>M</i> =15 years	NRI	Q/Q; Adolescent/Adolescent	Global Pos.; NRI – Support	Involv.; D	L
Theran (2003)	108	<i>M</i> =14.16 years; <i>M</i> =14.16 years	FQS	Q/Q; Adolescent/Adolescent	Global Pos.	C	CS
Williams et al. (2001)	72	<i>M</i> =17.7 years; <i>M</i> =17.7 years	NRI	Q/Q; Adolescent/Adolescent	Global Pos.; Intimacy	C; Specific C	CS

Note. ^a*Name of Friendship Measure Abbreviations:* PSS-Fr = Perceived Social Support – Friend Scale; NRI = Network of Relationships Inventory; IPPA = Inventory of Parent and Peer relationships; PRRI = Peer and Romantic Relationships Interview; RQ = Relationship Questionnaire; IDCS = Interactional Dimensions Coding System; BSQ = Behavioral Systems Questionnaire; IAA = Inventory of Adolescent Attachment; FQQ = Friendship Quality Questionnaire; ASBS = Adapted Social Behavior Scale; NRI-R = Network of Relationships Inventory-Revised; NRI-BSV = Network of Relationships Inventory – Behavioral Systems Version; CTS = Conflict Tactics Scale; FJQ = Friendship Jealousy Questionnaire; FQS = Friendship Qualities Scale.

^b*Type/Source of Measure Abbreviations:* Q = Questionnaire; I = Interview; O = Observation; Adolescent = Self-Report Measure; Friend = Friend-Report Measure.

^c*Question Assessed Abbreviations:* Involv. = Involvement Analysis; Specific Involv. = Specific Involvement Analysis; C = Global Quality Continuity Analysis; Specific C = Specific Quality Continuity Analysis; D = Differences Analysis; Specific D = Specific Quality Differences Analysis.

^d*Study Design:* CS = Cross-Sectional; L = Longitudinal.

Table 2

Results of Meta-Analyses of the Relations between Friendship Quality and Romantic Relationship Involvement

	k	N	r	95% CI	Q within	Moderators ^a
Global Positive Quality						
All Studies	9	1898	.04	-.03 to .12	17.46*	None
NRI – Support	4	1154	.04	-.10 to .18	12.23**	None
Specific Positive Qualities						
Companionship	3	664	-.03	-.13 to .08	4.02	N/A
Intimacy	3	664	.08	-.01 to .16	2.51	N/A
Security	2	279	.03	-.09 to .14	.41	N/A
Global Negative Quality						
All Studies	5	946	-.004	-.10 to .09	7.77	N/A
NRI – Negative Interactions	2	373	-.05	-.15 to .05	3.11	N/A
Specific Negative Qualities						
Conflict	3	664	.03	-.07 to .12	3.29	N/A

Note. ^a*Moderators:* None = No Significant Moderators; N/A = Could Not Run Moderators.

* $p < .05$, ** $p < .01$.

Table 3

*Results of Meta-Analyses of the Relations between Friendship Quality and Romantic Relationship**Quality*

	k	N	r	95% CI	Q within	Moderators ^a
Global Positive Quality						
All Studies	23	4040	.16***	.09 to .23	91.27***	None
NRI – Support	9	1099	.21***	.16 to .26	9.10	N/A
Specific Positive Qualities						
Intimacy	9	1933	.21***	.09 to .31	37.24***	SD
Security	4	1218	.14**	.05 to .22	4.31	N/A
Commitment	2	499	.20***	.11 to .28	0.00	N/A
Ability to Resolve Conflict	2	108	.17	-.06 to .38	1.38	N/A
Global Negative Quality						
All Studies	18	2944	.32***	.25 to .40	65.93***	Y; AFM
NRI – Negative Interactions	7	971	.39***	.31 to .46	8.96	N/A
Specific Negative Qualities						
Conflict	10	1548	.28***	.14 to .42	51.11***	None
Insecurity	2	368	.27*	.06 to .45	4.10*	N/A

Note. ^aModerators: Y = Year of Publication; AFM = Age at Friendship Measure; SD = Study Design;

N/A = Could Not Run Moderators; None = No Significant Moderators.

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

Table 4

Results of Meta-Analyses of the Differences between Friendship Quality and Romantic Relationship Quality

	k	N	Hedges's g^a	95% CI	Q within	Moderators ^b
Global Positive Quality						
All Studies	15	3281	-.15	-.54 to .24	1610.56***	Y; SD
NRI - Support	10	1993	.01	-.26 to .28	167.41***	Y
Specific Positive Qualities						
Intimacy	3	1082	.02	-.05 to .09	1.19	N/A
Security	2	1043	-.07	-.36 to .23	7.36***	N/A
Ability to Resolve Conflict	2	108	-1.18***	-1.39 to -.97	.79	N/A
Global Negative Quality						
All Studies	14	2675	.15*	.01 to .29	105.37***	None
NRI – Negative Interactions	8	1382	.14**	.003 to .04	15.71*	None
Specific Negative Qualities						
Conflict	7	1206	.04	-.14 to .22	47.97***	Y; G
Insecurity	2	193	.15	-.04 to .33	.12	N/A

Note. ^aHedges's g : a positive Hedges's g indicates adolescents' report experiencing more of a quality in their romantic relationships than in their friendships.

^b*Moderators*: SD = Study Design; Y = Year of Publication; G = Gender (Percent Boy); None = No Significant Moderators; N/A = Could Not Run Moderators.

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

Figure 1

PRISMA Flow Diagram for Included Studies

Appendix

Codebook

Background Information:

This document serves as a Codebook to use in conjunction with the Excel Spreadsheet for the meta-analyses.

Section 1:

In the first section of the Excel Spreadsheet, you will find preliminary information describing the studies that will be used in the analyses. Below is the list of variables and an explanation of the variables in the Preliminary Information Section:

Section 1a: Preliminary Information

Variable Name	Description	Code
1. Coder Initials	Initials of person coding	1 = LK 2 = ME
2. Code Date	Date study was coded	xx/xx/xxxx
3. Study Authors	APA format, list all authors	
4. Year	Publication Year	
5. Journal/Book	Title of Journal/Book	
6. Volume/Chapter	Number of Volume/chapter	
7. Page	Page Numbers of article	
8. Source		0 = Book Chapter 1 = Journal 2 = Dissertation
9. Inclusion		0 = Exclusion 1 = Inclusion

9b. Reason for Exclusion:

0 = Lack of friendship or sibling relationship quality measure (e.g., studies of peer group variables such as likeability, popularity, victimization or rejection excluded; number or gender of siblings)

1 = Lack of romantic relationship involvement or quality measure of adolescents' romantic relationship (e.g., studies of sexual health, sexual attitudes, sexual involvement, perceptions/ideas of romantic relationships, studies of group dating, or hanging out in mixed-sex peer group)

2 = no effect size information available (e.g., not an empirical study, effect size information unavailable for connections between sibling friendship quality and romantic involvement or quality)

3 = Not a typical developmental sample (e.g., sample includes developmental disorders such as autism)

4 = Mean age of sample over 18 years (e.g., college excluded, high school included)

5 = Study asked about past relationships (relationship ended over 18 months ago)

Section 2:

In the second section of the Excel Spreadsheet, you will find information describing the sample and the design used in the studies included in the analyses. Below is the list of variables and an explanation of the variables of the Sample and Design section.

Section 2a: Sample Characteristics

10. SES	Socioeconomic status of sample (80% of sample must be in a category to consider it that SES; e.g., 80% middle class is coded 1, 40% middle class, 60% lower class is considered mixed). If vague, but says “majority” or “most” of sample was in one category, it can be coded as that category (e.g., majority middle class sample = 1)	0 = High 1 = Middle 2 = Low 3 = Mixed 4 = Not specified
11. % Intact Family	% of sample with intact family % of sample with single parents % sample with step parent/blended	Indicate %
12. Ethnicity	Percent Caucasian Percent Black Percent Hispanic Percent Asian Percent Middle Eastern Percent other (specific) Not specified	Indicate %
13. Minority	Minority status of sample (80% or more of sample is minority)	0 = not a minority sample 1 = yes, minority sample
14. Country (Global)	Region study was conducted	0 = US/Canada/Europe 1 = Mexico/Central/South America 2 = Australia 3 = Asia 4 = Africa

15. Total N	Total included participants	(# of participants included in analyses – check method/ results)
Section 2b: Study design information		
16. Design	Type of study design (cross-sectional: all data collected over less than one month)	0 = Cross-sectional 1 = Longitudinal
17. Resource/Study	What, if any, study is this study drawn from?	
18. Notes	Additional Information regarding the study design	
Section 2c: Adolescents' Characteristics		
19. Sample Gender	% boys	
20. Age at relational measure	Age of sample in years when relational quality was assessed	
21. Age at romantic measure	Age of sample in years when romantic relationship outcome was assessed	
22. Notes	Other information regarding the adolescents' characteristics	

Section 3:

1.	Does the study include sibling quality data	0 = no
1 = yes
2.	Does the study include friendship quality data	0 = no
1 = yes

Measure	measure	
3. Type of quality measured	*If there are multiple qualities, list each on a separate line in excel file*	<p>0 = global positive (e.g., measure of romantic quality didn't distinguish distinct qualities, or it did, but results were aggregated and cannot be separated)</p> <p>1 = global negative (e.g., measure of romantic quality didn't distinguish distinct qualities, or it did, but results were aggregated and cannot be separated)</p> <p>2 = Specific positive qualities:</p> <ul style="list-style-type: none"> a. Companionship/recreation/affiliation b. Intimacy/disclosure/closeness (e.g., affective bond, reflected appraisal) c. Security (e.g., attachment security, reliable alliance) d. Validation/caring/admiration (e.g., compliments, friend says nice things about person) e. Help/ guidance/ instrumental aid/ protection/ nurturance (e.g., asking for advice, loaning things to each other) f. Able to resolve conflict <p>3 = Specific negative qualities:</p> <ul style="list-style-type: none"> a. Conflict (e.g., antagonism, harshness) b. Power (e.g., control) c. Jealousy d. Rivalry/competition <p>4 = Other specific quality (list quality)</p>

If the article includes information on friendship quality:

1. Type of Measure		<p>0 = child questionnaire</p> <p>1 = other (specific) reported questionnaire</p> <p>2 = child interview</p> <p>3 = other (specific) reported interview</p> <p>4 = observation</p> <p>5 = task</p> <p>6 = other (specify)</p>
2. Name of Measure	Enter the name of the measure	

3. Type of quality measured ***If there are multiple qualities, list each on a separate line in excel file***
- 0 = global positive (e.g., measure of romantic quality didn't distinguish distinct qualities, or it did, but results were aggregated and cannot be separated)
- 1 = global negative (e.g., measure of romantic quality didn't distinguish distinct qualities, or it did, but results were aggregated and cannot be separated)
- 2 = Specific positive qualities:
- Companionship/recreation/affiliation
 - Intimacy/disclosure/closeness (e.g., affective bond, reflected appraisal)
 - Security (e.g., attachment security; reliable alliance)
 - Validation/caring/admiration (e.g., compliments, friend says nice things about person)
 - Help/ guidance/ instrumental aid/ protection/ nurturance (e.g., asking for advice, loaning things to each other)
 - Able to resolve conflict
- 3 = Specific negative qualities:
- Conflict (e.g., antagonism, harshness)
 - Power (e.g., control)
 - Jealousy
 - Rivalry/competition
- 4 = Other specific quality (list quality)

Romantic variables

1. Does the study include romantic involvement data	0 = no 1 = yes
2. Does the study include romantic quality data	0 = no 1 = yes

****The excel spreadsheet should have at least two rows for each study. The first row should contain the coding information for romantic relationship involvement. The second row should contain the coding information for romantic relationship quality.**

If the article includes information on romantic relationship involvement:

- Type of Measure 0 = child questionnaire

1 = other (specific) reported questionnaire
 2 = child interview
 3 = other (specific) reported interview
 4 = observation
 5 = task
 6 = other (specify)
 7 = no romantic involvement measure (skip to quality measure coding if 7 is selected)

2. Name of Measure Enter the name of the measure

3. Time frame of romantic involvement

0 = current
 1 = past (specify in months how long ago the relationship occurred; up to 18 months ago)
 2 = mixed (if study included both adolescents who were currently involved, and those who were involved in the past 18 months)

If the article includes information on romantic relationship quality:

1. Type of Measure

0 = child questionnaire
 1 = other (specific) reported questionnaire
 2 = child interview
 3 = other (specific) reported interview
 4 = observation
 5 = task
 6 = other (specify)
 7 = no romantic quality measure

2. Name of Measure Enter the name of the measure

3. Type of quality measured

0 = global positive (e.g., measure of romantic quality didn't distinguish distinct qualities, or it did, but results were aggregated and cannot be separated)
 1 = global negative (e.g., measure of romantic quality didn't distinguish distinct qualities, or it did, but results were aggregated and cannot be separated)
 2 = Specific positive qualities:
 a. Companionship/recreation/affiliation
 b. Intimacy/disclosure/closeness (e.g., affective bond, reflected appraisal)
 c. Security (e.g., attachment security;

- reliable alliance)
- d. Passion (e.g., feelings of intense love)
- e. Commitment
- f. Validation/caring/admiration (e.g., compliments, friend says nice things about person)
- g. Help/ guidance/ instrumental aid/ protection/ nurturance (e.g., asking for advice, loaning things to each other)
- h. Conflict resolution
- 3 = Specific negative qualities:
 - a. Conflict (e.g., antagonism, harshness)
 - b. Power (e.g., control)
 - c. Jealousy
 - d. Rivalry/competition
- 4 = Other specific quality (list quality)

Section 4:

In the fourth section of the Excel Spreadsheet, insert relevant effect size. Include relevant statistical analyses, and notes.

If there is more than one outcome variable for which there is effect size information, create a new line in the excel file and fill each line out according to the columns below (so one study may have three lines with different correlation/effect size information depending on the particular variable of interest):

N used in calculation	Correlation	Non-correlation effect size information (means, standard deviations, <i>F</i> values, <i>t</i> values, chi square's)	<i>p</i> -value	Adjusted effect size? Yes/No