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Adolescent Partnership Quality and Emotional Health: Insights from an Intensive Longitudinal Study

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Abstract

Prior research has documented an association between adolescents' romantic experiences and poor emotional health. However, lack of intensive longitudinal measurement and an emphasis on negative affect have limited understanding about the extent to which adolescent relationship quality influences the emotional health of adolescents in partnerships, including the potential benefits of high-quality partnerships. Previous research has also been limited in its ability to account for factors that select adolescents into lower or higher quality partnerships. Using biweekly intensive longitudinal data from the mDiary Study of Adolescent Relationships linked to six waves of birth cohort data from the Fragile Families and Child Wellbeing Study, this paper uses multilevel mixed-effects models to address three questions: (1) How are changes in partnership quality (defined as validation, frequency of disagreements, and global quality) associated with changes in both positive and negative affect; (2) Do observed associations persist net of factors that potentially select adolescents into lower or higher quality partnerships (e.g., childhood family experiences); and (3) Do associations between partnership quality and affect differ by gender? Results show that higher quality partnerships are associated with both decreases in negative affect and increases in positive affect. There were no significant gender differences on average. The study's findings highlight the importance of partnership quality as a key source of temporal variation in adolescents' emotional states.

Introduction

Before the turn of the millennium, studies about adolescent development often characterized adolescent romantic relationships as frivolous, partly because they were deemed transitory (Furman, Brown, and Feiring 1999). More recent scholarship considers partnership formation a central developmental task of adolescence (Furman and Shaffer 2003). A

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growing body of empirical work shows associations between romantic involvement and poor adolescent emotional health (e.g., Joyner and Udry 2000; Davila 2008; Furman and Collibee 2014; Olson and Crosnoe 2017). Although the consequences of adolescent partnerships partly depend on their quality (Collins 2003), the potential benefits of involvement in high-quality relationships have been examined less frequently than the negative emotional and behavioral consequences, leading to an incomplete picture of the ramifications of adolescent romantic partnerships (Harden 2014; Gómez-López, Viejo, and Ortega-Ruiz 2019).

Because most studies that assess links between partnership quality and adolescent outcomes rely on cross-sectional surveys or longitudinal surveys with long interwave intervals, prior research has also been limited in its ability to observe changes in the functioning of adolescent relationships over time along with fluctuations in emotional health (Karney et al. 2007; Collins, Welsh, and Furman 2009; Goldberg and Tienda 2017). Without frequent measurement, it is difficult to assess the specific aspects of romantic involvement that influence adolescent emotional health, as well as to disentangle potential reverse and bidirectional causal links between relationship experiences and emotional health (e.g., depressive symptoms may both increase and be increased by romantic dysfunction) (Davila 2008; Furman et al. 2019).

This study uses novel biweekly diary data collected over the course of a year to examine time-varying associations between adolescents' relationship quality and their emotional health. Using intensive longitudinal data from the mDiary Study of Adolescent Relationships (mDiary) linked to six waves of birth cohort data from the Fragile Families and Child Wellbeing Study (FFCWS), we address: (1) whether and how changes in adolescent partnership quality are associated with changes in negative and positive affect; (2) whether these associations persist net of factors that potentially select adolescents into lower or higher quality partnerships (e.g., childhood exposure to poor-quality parental relationships, harsh parenting during childhood); and (3) whether associations between adolescent partnership quality and emotional health differ by gender. Following Hassebrauck and Fehr (2002), we use several measures to capture positive and negative partnership quality, including validation, frequency of disagreements, and a global report of quality.

This study advances understanding of the consequences of adolescent relationships in three main ways. First, we assess both potential detrimental and salutary influences on emotional health. Second, we capitalize on biweekly prospective measurement precision to capture fluctuations in partnership quality over time and to sequence events occurring close together in time. Finally, by linking intensive longitudinal data with data from a six-wave birth cohort study, we are able to more fully adjust for potential selection into lower and higher quality partnerships.

Following a review of past literature about links between adolescent partnerships and emotional health, we describe our data, measures, and analytic methods. After reporting key findings, we discuss the study's contributions to the literature on adolescent romantic experiences and emotional health, with attention to study limitations and implications for future research and practice.

Prior Literature

Adolescent Romantic Involvement and Poor Emotional Health

A substantial body of empirical research finds cross-sectional associations between involvement in relationships and depressive symptoms (e.g., Doyle et al. 2003; Furman and Collibee 2014). For instance, Steinberg and Davila (2008) found that a greater number of past romantic experiences was positively correlated with current depressive symptoms among adolescent girls. Doyle et al. (2003) observed a positive cross-sectional association between steady dating and symptoms of depression among girls but not boys.

Longitudinal studies with interwave intervals of 6 months or longer have also observed associations between adolescent romantic involvement and later depression (e.g., Joyner and Udry 2000; Davila et al. 2009; Olson and Crosnoe 2017). In a landmark study using data from the National Longitudinal Study of Adolescent to Adult Health (Add Health), Joyner and Udry (2000) found that girls and boys who became romantically involved between interviews experienced a larger increase in depression 1 year after their baseline assessment than their peers who did not, partly because their romantic experiences diverted attention from other important areas of socioemotional functioning, including family relationships and school performance.

Collectively, studies based on cross-sectional and periodic longitudinal designs have generated a solid evidence base linking adolescents' romantic experiences with poor psychosocial outcomes; however, most lacked the data needed to clarify what aspects of romantic relationships produce the observed outcomes. Moreover, lack of intensive prospective measurement further limited investigation of the causal ordering of changes occurring in close temporal proximity. Recently, Furman et al. (2019) called for moving beyond snapshots of adolescent romantic experiences by more intensely measuring changes in relationships across more than two time points; their call stresses the need for intensive longitudinal research designs to assess both the content and consequences of adolescent partnerships.

Adolescent Relationship Quality and Poor Emotional Health

Although less frequently the subject of empirical study, relationship quality is considered essential to understanding the consequences of adolescent romance. Collins (2003) argued that quality differences likely explain many of the differences among relationships that have been attributed to measures of involvement. Relationship quality in adolescence has been positively associated with romantic self-concept, global self-esteem, and even general competence (Collins 2003; Furman and Shaffer 2003), as well as with increased likelihood of relationship commitment in early adulthood (Seiffge-Krenke 2003).

Several studies link adolescent relationship quality and poor emotional health outcomes. For instance, Soller (2014) used Add Health data to associate incongruence between actual romantic experiences and idealized relationship scripts with severe depression among girls. Based on a meta-analysis of 21 studies linking adolescent relationship quality and/or relationship dissolution with several mental health outcomes (depression, suicide ideation,

deliberate self-harm, and suicide), Mirsu-Paun and Oliver (2017) concluded that relationship quality was more strongly associated with these outcomes than was dissolution.

Recently, Rogers et al. (2018) used an ecological momentary assessment design with daily measurement over a 3-month period to assess links between relationship quality and negative affect among 98 adolescent couples in exclusive relationships. They observed that on days when adolescents reported higher levels of relationship conflict and/or negative romantic feelings than their typical (cross-time) average, they also reported higher levels of negative affect. Although unique in its measurement precision, the study's focus on a single exclusive relationship per respondent limited generalization to other partnership types and precluded assessment of within-person changes across multiple partnerships.

Taken together, these studies identify aspects of adolescent partnerships associated with negative emotional outcomes, but their focus remains on detrimental consequences. Furthermore, their designs often limit observation of within-person changes over time.

Adolescent Romance and Positive Affect

Developmental psychologists contend that romantic experiences are a primary source of both negative and positive emotion for adolescents (Collins 2003; Furman and Shaffer 2003). Links with positive emotion can be expected for a variety of reasons. For instance, high-quality relationships can produce pleasurable feelings, enhanced intimacy, greater competence, and increases in self-efficacy and self-worth, all of which also can serve as mechanisms to increase positive affect (Collins 2003; Furman and Shaffer 2003; Harden 2014).

Most empirical investigations examining the benefits of romantic experiences have been limited to adults. Several studies with adult samples have found associations between positive affect and romantic involvement and/or partnership quality (e.g., Kamp Dush and Amato 2005). For example, Demir (2008) linked feelings of emotional security and companionship with feelings of happiness among young adults in relationships. Linking adolescence and early adulthood, Kansky and Allen (2018) reported that support from a romantic partner at age 17 was associated with positive psychological functioning at age 25–27. Notably, a recent systematic review of literature on the association between romantic relationships and wellbeing during both adolescence and emerging adulthood concluded that romantic relationships play an important role in wellbeing during both life stages (Gómez-López, Viejo, and Ortega-Ruiz 2019). Mirroring the emphasis in the literature, however, <20% of the studies reviewed focused on adolescence.

Several scholars have sought to balance the disproportionate emphasis on risk behavior in the study of adolescents' relationships by proposing a sex-positive framework. Halpern (2010) and Harden (2014) argue that because healthy adolescent development entails active exploration of identity, values, goals, and behavior, including sexuality, researchers must seek to clarify pathways to healthy sexual well-being. Importantly, they call for better understanding of the extent to which relationship quality moderates the psychological impacts of adolescent sexual experiences.

Gender Variation in Associations Between Relationship Quality and Affect

Prior research has not reached consensus about whether associations between adolescent romantic experiences and emotional health outcomes differ by gender. Several studies identified stronger associations among girls (Joyner and Udry 2000; Doyle et al. 2003; Soller 2014; Mirsu-Paun and Oliver 2017). In fact, Joyner and Udry (2000) concluded that adolescent girls' greater vulnerability to romantic involvement explained a large part of the emerging gender difference in depression during adolescence.

Evidence of a stronger association between relationship experiences and poor emotional health for girls is consistent with research suggesting that, given their strong affiliative styles, romantic relationships may be more prominent role identities for girls than boys (Soller 2014). Socialization of boys to be sexual and romantic initiators may also contribute to less emphasis on romantic ideals as opposed to behaviors; the opposite may be true for girls, who face stronger social controls against relationship formation and sexual behavior (Cavanagh 2007). Other research posits that adolescent girls may be more concerned with relationships than boys owing to their greater emotional maturity (Darling et al. 1999). The apparently stronger association between romantic experiences and emotional health may also at least in part be an artifact of girls' greater willingness to acknowledge negative emotions compared with boys (Mirsu-Paun and Oliver 2017).

Not all studies find gender differences in associations between romantic experiences and poor emotional health. Furman and Collibee (2014) and Rogers et al. (2018) observed no significant gender variation in associations between negative affect and adolescent romantic involvement or quality, respectively. Their findings are consistent with mixed-methods research by Giordano, Long-more, and Manning (2006) showing that boys reported similar levels of emotional engagement in romantic relationships as girls. Although these studies investigated gender variation in associations with poor emotional health, to our knowledge no studies to date have examined whether adolescent boys and girls benefit similarly from high-quality partnerships. Giordano et al.'s (2006) findings, which revealed similar feelings of love and emotionality in relationships among adolescent boys and girls, support this premise.

Family Experiences and Selection into Lower or Higher Quality Romantic Relationships

Scholarship on the transition from childhood to adolescence has documented a shift in engagement and influence away from parents and toward peers over the course of adolescence. However, even as peers gain in salience and influence, familial relationships remain critically important sources of support, control, and socialization (Larson et al. 1996; Seiffge-Krenke 2003). Because adolescents forge romantic relationships in the context of (positive and negative) family relationships and influences over time, the family constitutes an important social context within which to situate adolescents' relationships.

Childhood family experiences represent a potentially important selection mechanism into lower or higher quality romantic partnerships. A sizeable body of research has documented links between childhood family experiences—including parental partnership quality (e.g., Amato and Booth 2001) and the quality of the parent–child relationship (River et al. 2022)

—and adult partnership quality. A smaller body of work has explored associations with adolescent partnerships (e.g., Karney et al. 2007; Roisman et al. 2009; Goldberg et al. 2019). For example, one study (Goldberg et al. 2019) observed that adolescents exposed to poor-quality maternal partnerships in middle childhood were less likely to report high-quality relationships themselves. Another (Roisman et al. 2009) found that high-quality relationships with parents before and during adolescence were positively associated with the quality of adolescents' romantic relationships at age 15.

Explanations for associations between adverse childhood family environments and later relationship outcomes focus on observational social learning, attachment, developmental psychopathology, and toxic stress. Observational social learning postulates that offspring model behaviors in their parents' partnerships in their own relationships (Bandura 1977); offspring may also learn from the way their parents interacted directly with them (River et al. 2022). Developmental psychopathology and attachment explanations generally argue that childhood family adversity can affect later relationship outcomes by interrupting foundational developmental tasks, such as developing a positive self-concept or emotional regulation skills (Allen 2008; River et al. 2022). Toxic stress explanations emphasize the impacts of strong, repeated, and/or sustained activation of the body's stress-response system in the absence of buffering adult support, especially during sensitive developmental periods, which can lead to lifelong weakening of emotionality and stress responsiveness (Shonkoff, Boyce, and McEwen, 2009). Consistent with a life course perspective, the impacts of such life events may depend on their timing (Elder 1998). Toxic stress research has identified early childhood as a particularly sensitive period (Shonkoff, Boyce, and McEwen 2009), whereas exposures during middle childhood and early adolescence may be most salient for observational learning (Goldberg et al. 2019). Attachment explanations have often focused on early bonding, but also consider later and cumulative experiences (Sroufe et al. 1999; Allen 2008).

Current Study

Based on the literature reviewed above, the current study addresses three gaps in empirical work to date on associations between adolescent relationships and emotional health. First, most studies have focused on deleterious consequences. Second, lack of measurement precision has limited the ability of studies to account for the flux often characteristic of adolescent romance and to establish the sequencing of changes in relationship quality and in affect. Third, existing studies have lacked prospective measurement of childhood precursors that may select adolescents into lower or higher quality partnerships. Using data from a year-long intensive longitudinal digital diary study and a 15-year six-wave birth cohort study, the current study evaluates both the potentially adverse and salutary emotional consequences of adolescent romantic experiences by tracing changes in partnership quality and in affect across short time intervals within- and between-subjects, while also considering selection into relationships and heterogeneity by gender.

Data and Methods

To investigate time-varying associations between adolescents' relationship quality and positive and negative affect, this study used data from the mDiary Study of Adolescent Relationships. mDiary is a year-long intensive longitudinal study whose participants represent a subsample of a 15-year birth cohort study, the FFCWS. The FFCWS has followed a cohort of children born at the turn of the millennium in 20 medium-to-large U.S. cities; births to unmarried mothers were oversampled (Reichman et al. 2001). The FFCWS surveyed children and their families over six waves, in the hospital at the time of birth and subsequently when the children were roughly 1, 3, 5, 9, and 15 years old. Youth were interviewed directly at ages 9 and 15.

From 2016 to 2017, mDiary recruited adolescents who had participated in the most recent wave of the FFCWS and whose FFCWS baseline interview was conducted in one of 15 target cities.[1] Roughly half of adolescents who fit these criteria were located and assented for the study and, of these, 77% (531) completed the enrollment survey. The 531 mDiary participants were eligible to complete 25 short surveys over the course of 1 year. On average, mDiary participants were slightly more advantaged than those who participated in the FFCWS year-15 wave. For instance, a larger share of mDiary adolescents had mothers who were college educated compared with participants in the FFCWS year-15 wave. In addition, more mDiary participants had mothers who were non-Hispanic white and fewer had mothers who were teenagers at the time of their birth (tabulations available upon request).

mDiary surveys were administered via a mobile-optimized custom web app linked to the Qualtrics web survey platform; most respondents (86%) completed the surveys using smartphones. During the observation period, the 531 mDiary participants completed 9,861 of the 13,806 biweekly surveys for which they were eligible—an overall compliance rate of 71.4%. As in other longitudinal surveys of adolescents (e.g., Chantala, Kalsbeek, and Andraca 2005), compliance was higher among female than male participants (Goldberg, Koffman, and Tienda 2019).

mDiary's prospective measurement precision, which permits observation of changes in relationship quality and emotional wellbeing over short durations, is essential to minimize recall biases, especially because adolescent partnerships are typically of shorter duration than those of adults, and often ambiguous during their emergent stages (Collins, Welsh, and Furman 2009; Goldberg, Koffman, and Tienda 2019). That associations between romantic experiences and emotional health are potentially bidirectional also requires intensive longitudinal data to adjudicate reverse or reciprocal causal links (Davila 2008). Most intensive longitudinal studies involve closely timed measures over a short period of time, typically ranging from 1 week to 1 month. Although such compressed study periods are appropriate for capturing temporal variations in emotional states, they are less well suited for portraying developmental processes, such as romantic experiences, that unfold over longer periods. mDiary's methodology was based in part on that used in the Relationship

[1]The 15 target cities were Baltimore, Boston, Corpus Christi, Indianapolis, Jacksonville, Milwaukee, Nashville, Newark, New York, Norfolk, Philadelphia, Pittsburgh, Richmond, San Antonio, and San Jose.

Dynamics and Social Life Study (RDSL) (Barber, Kusunoki, and Gatny 2011), which followed respondents' partnerships over 2.5 years.[2]

The mDiary surveys inquired about adolescents' partnerships, if any, as well as their positive and negative affect on a biweekly basis. An innovative application of Qualtrics panel functionality facilitated tracing partnerships across surveys and permitted customized follow-up questions about specific partnerships. Tracing partnerships in this way was essential to precisely measure flux in relationship involvement and quality over time. Partnerships could be of any variety, including those characterized as dating, friends with benefits, talking/flirting, or other types. Using this definition, over two-thirds of mDiary respondents named at least one partner over the course of their participation in mDiary; of these, roughly half named more than one partner, with a mean of two named partners. In addition to movement between partners, 11% of adolescents reported churning within partnerships. Partnerships averaged 5.9 surveys across spells, implying a mean length of ~12 weeks.

The analytic sample was restricted to adolescents who named at least one partner and to person-surveys with non-missing values on the outcome and predictor variables, which included 350 adolescents and 6,729 person-surveys. Of the 181 respondents excluded from the sample, 172 were dropped for never naming a partner over the course of their participation in mDiary and only 9 were excluded due to other missing data. Diagnostic tabulations revealed nominal differences between adolescents included and excluded from the analytic sample, with one exception (see Appendix Table 1): a higher proportion of boys in the analytic sample had US-born mothers (85.3%) relative to boys excluded from the sample (71.6%).

Measures

In what follows, we describe the operational definitions for the outcome, predictor, and control variables. Tables 1 and 2 provide descriptive statistics for all measures.

Affect

Positive and negative affect were measured separately given well-established evidence that they represent distinct constructs (Diener and Emmons 1984; Watson and Tellegen 1985).[3] Both positive and negative affect were reported on a biweekly basis. Previous work has documented the validity of self-assessments of affect due to the frequency with which individuals reflect on their emotions and label them in the process of doing so (Walker and Schimmack 2008).

Positive affect—To measure positive affect, respondents were asked in each biweekly survey to report how often they felt happy in the past 2 weeks. Original response categories

[2]The RDSL methodology differed from mDiary in topical focus (unintended pregnancy), target sample (emerging adults), survey frequency (weekly), study period (2.5 years), survey mode (telephone and web survey), and sampling frame (driver's license and personal identification card records).

[3]In addition, we calculated correlations between positive and negative affect both across all surveys and within a single survey. In both cases, we found a moderate inverse correlation, consistent with prior research (e.g., Diener and Emmons 1984). The Pearson's correlation between the two measures was −0.47 in the first diary survey, and −0.56 aggregated across all waves.

ranged from 1 (never or rarely) to 4 (most of the time). We merged the two categories representing the lowest levels of happiness because very few adolescents selected them, such that 1 = never, rarely, or sometimes, 2 = a lot of the time, and 3 = most of the time.

Negative affect—To capture negative affect, respondents were asked how often they felt sad within the past 2 weeks. Original response categories ranged from 1 (never or rarely) to 4 (most of the time). This measure also was transformed by combining two response categories, in this case on the higher end of the scale where the most negative affect was concentrated, such that 1 = never or rarely, 2 = sometimes, and 3 = a lot of the time or most of the time.[4]

Adolescent partnership quality

Following prior research (e.g., Auslander et al. 2009; Rogers et al. 2018), we used three measures of relationship quality to capture multiple dimensions underlying the construct (Hassebrauck and Fehr 2002) and to balance positive and negative relationship attributes.

Global partnership quality—In each biweekly survey, respondents in a partnership were asked to describe their relationship "overall" using a scale from 1 (poor) to 5 (excellent). Due to small cell sizes, we combined the categories of poor and fair, resulting in a four-category scale ranging from 1 (fair/poor) to 4 (excellent) that we modeled as a continuous measure.

Validation—To measure validation, we assessed respondents' level of agreement with a statement gauging whether their partner makes them feel good about themselves. The original item presented respondents with a 4-point Likert scale ranging from strongly disagree to strongly agree. We combined strongly disagree and somewhat disagree due to small cell sizes, resulting in a tri-partite measure where 1 = strongly or somewhat disagree, 2 = somewhat agree, and 3 = strongly agree.

Frequency of disagreements—This measure used adolescent reports on frequency of fighting or arguing with their partner over the past 2 weeks, where 1 = never, 2 = rarely, and 3 = sometimes or often. Due to low frequency responses, this variable was transformed from four response categories to three by combining sometimes and often.

Childhood family experiences

Measures of childhood family experiences included exposure to poor maternal partnership quality as well as harsh maternal psychological and physical parenting.

Maternal partnership quality—To measure mothers' partnership quality, we constructed wave-specific scales from the FFCWS that combined maternal reports on positive and negative aspects of their current partnerships (whether a marriage, cohabitation, or non-residential partnership), including how frequently (often, sometimes, or never) their partner was fair and willing to compromise when they disagreed, expressed affection or love,

[4]Robustness checks to retaining the original four-category operationalization of affect revealed substantively identical results for both positive and negative affect.

insulted or criticized them or their ideas, encouraged them or helped them do things important to them, listened to them when they needed someone to talk to, and really understood their hurts and joys. Higher scale values represented poorer quality partnerships. Principal components analyses confirmed that single factors adequately represented the items (.77, .78, and .82, respectively, for years 3, 5, and 9).

At each wave, mothers scoring above the 75th percentile were designated as having poor-quality partnerships. From these measures, we generated a four-category summary variable denoting whether respondents' mothers reported a poor-quality partnership in early childhood only (FFCWS year-3 and/or year-5 waves), in later childhood only (year-9 wave), in both early and later childhood, or in neither period (reference). In keeping with prior research (Schneider, Harknett, and McLanahan 2016; Goldberg et al. 2019), and with a focus on the exposures to unhealthy partnership dynamics theorized to impact adolescents, if the mother was not in a partnership at a particular wave, the child was coded as not being exposed to a poor-quality maternal partnership.[5]

Harsh parenting—We modeled maternal psychological and physical aggression toward the child by drawing on a series of FFCWS questions based on the Parent–Child Conflict Tactics Scales (Straus et al. 1998), asked in the year-9 mother interview and the primary caregiver year-3 and year-5 interviews. We operationalized psychological aggression with questions from a subscale asking how often in the past year (never, once, twice, 3–5 times, 6–10 times, 11–20 times, > 20 times) mothers shouted, yelled, or screamed at the child; swore or cursed at the child; threatened to spank or hit the child but did not do it; called the child names; and threatened to send the child away or kick the child out of the house. The physical aggression subscale asked how often in the past year the mother shook the child; hit the child on the bottom with a hard object; spanked the child on the bottom with a bare hand; slapped the child on the hand, arm, or leg; and pinched the child. To reflect frequency (Straus et al. 1998), we recoded each item in both subscales with a midpoint value (0, 1, 2, 4, 8, 15, and 25) and constructed wave-specific indicators designating scores above the 75th percentile for the sample (Berger, McDaniel, and Paxson 2005; Goldberg et al. 2019). We did not consider harsh parenting by fathers because these questions were not asked of fathers in the year-3 or year-5 FFCWS waves.

Controls

Our models also included a variety of controls derived from both mDiary and the FFCWS, including sociodemographic characteristics of adolescents and their parents, measures of time trends, baseline levels of happiness/sadness, and partnership type.

Baseline affect—To isolate within-subject processes during the study period, analyses of intensive longitudinal data often include baseline measures of the outcomes of interest (Bolger and Laurenceau 2013). As such, analyses included measures of positive and negative affect at mDiary baseline, defined in the same manner as the outcome measures.

[5]Results were robust to also including dummy variables for mother not in relationship at FFCWS years 3, 5, and 9.

Survey wave—A continuous measure of survey wave controls for potential confounding with the passing of time. This measure was zero-centered on survey 2, the first survey inquiring about partnerships.

Partnership type—In each survey, participants were asked to classify their current partnership as either dating (reference), friends with benefits, talking/flirting, or other. We retained these original categories.[6]

Sociodemographic characteristics—All models also controlled for other sociodemographic and family characteristics that might confound associations between adolescents' relationship quality and positive and negative affect. These included mother's completed education at FFCWS baseline (less than high school graduate [reference], high school diploma or GED, some college or technical school, or college graduate or higher); mother's poverty ratio at baseline (household income 0–49% [reference], 50–99%, 100–199%, 200–299%, or 300% or more of the federal poverty line); mother's marital status at birth (not married or cohabiting [reference], married, or cohabiting); mother's age in years at the time of the child's birth; and mother's nativity (US-born [reference], foreign-born). All empirical specifications also included controls for adolescents' self-reported race/ethnicity (non-Hispanic White [reference], non-Hispanic Black, Hispanic/Latino, non-Hispanic other, or non-Hispanic multiracial), measured in the year-15 FFCWS wave, and for respondents' age in months in the mDiary baseline survey. Lastly, we controlled for respondent sex at birth (male [reference], or female), which was also modeled as a potential moderator.[7]

Analytic Strategy

To examine associations between relationship quality and changes in adolescent affect, we estimated multilevel mixed-effects models that accounted for repeated measures within individuals and temporally autocorrelated errors. These models distinguish between- and within-person levels of analysis, which is essential for drawing inferences about within-subject processes over time (Bolger and Laurenceau 2013). Specifically, between-subject levels of analysis capture differences in average level of affect across individuals, whereas within-subject levels capture temporal differences in affect within individuals across time. To further isolate within-subject processes, we also split each partnership quality measure into two components that distinguished between-person differences in average partnership quality from within-person deviations from person-specific averages (Bolger and Laurenceau 2013). Thus, a negative within-person association would indicate that when adolescents' partnership quality exceeded their own average quality across waves, their level of sadness was lower than their interwave average. A negative between-person association would indicate that adolescents with higher average partnership quality had lower average levels of sadness.

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6. Respondent reports of partnership type may or may not coincide with partnership duration (e.g., partnerships considered "dating" were likely of longer duration than those considered "talking/flirting," but this is not necessarily the case). Partnership duration cannot be captured precisely using mDiary data because of left censoring.

7. In separate analyses, we also examined the robustness of our results to controlling for measures of respondents' total number of partners prior to mDiary, sexual onset prior to age 15, gender composition of the partnership, and where the couple first met. Results were robust to inclusion of these variables, and they were not independently associated with the outcomes; as such, and because they introduced additional missing data, we excluded them from our final models.

Because both positive and negative affect were measured on ordinal scales, our multilevel models used an ordered probit specification. Mixed-effects models incorporate both fixed and random effects, unlike fixed effects models.[8] Random effects essentially capture the unique effect of the predictor for the cluster of interest, here the adolescent (McNeish and Kelley 2019). Thus, including random slopes for partnership quality allowed the association between partnership quality and affect to vary across individuals, under the assumption that individuals might differ in their sensitivity to changes in partnership quality. Stated differently, the random effects assessed whether relationship quality was more consequential for some respondents than others. To adjust the standard errors for multiple partnerships among some individuals, all models clustered standard errors within individuals. The two-level analyses assessed changes in relationship quality relative to what adolescents had experienced previously across partnerships. Neither the number of partnerships per individual nor the number of observations per relationship sufficed to support a three-level multilevel analysis that nested observations within partnerships within individuals.

Descriptive analyses used Stata's *xttab* command to decompose counts into between and within components, and Stata's *xtsum* command to decompose standard deviations into between and within components (StataCorp 2019). Multivariate analyses used Stata's *meoprobit* commands. Four models were specified for each outcome. The first three models separately considered each dimension of partnership quality (global quality, validation, and frequency of disagreements). A fourth model included all three measures simultaneously.[9] To test for gender differences, we also separately examined interactions of respondent sex with each dimension of partnership quality.

Results

Descriptive Results

Table 1, which presents descriptive results for the time-invariant measures analyzed, shows that 59% of the sample was female, with a mean age of 16. Over one-third of girls and 27% of boys reported being non-Hispanic Black, and 24% of girls and 32% of boys identified as Hispanic. Almost half of the sample had a mother who had completed at least some college or technical training. Roughly one-third of the sample had a mother who was neither married nor cohabiting at the time of birth. With respect to childhood family experiences, exposure to poor-quality maternal partnerships was most common in early childhood; over one in five adolescents were exposed to a poor-quality maternal partnership at ages 3 or 5 and not subsequently. A larger share of boys (42%) reported maternal psychological harsh parenting relative to girls (31%); gender differences were smaller for physical harsh parenting (38% vs. 33%).

Table 2, which presents descriptive results for the time-varying outcome and adolescent partnership measures, reports both overall means and percentages across person-surveys,

[8] We could not include dummy variables for each cluster affiliation in our models as predictor variables, as is often done in fixed effects models (McNeish and Kelley 2019), because of the large number of individuals (our clustering variable) in the analytic sample.

[9] Tests for multicollinearity revealed tolerance levels above 0.6 for all but two measures: the between-individual specifications of global quality and validation. Results for the fourth model can thus be interpreted in the context of potential multicollinearity for those measures.

as well as between- and within-subject variances and percentages. Across person-surveys, the modal response for frequency of happiness was “most of the time,” and for sadness was “never or rarely.” That girls’ reported happiness was slightly lower, and their sadness slightly higher, on average, than that of boys aligns with findings of prior research on gender differences in depression during adolescence (e.g., Hyde, Mezulis, and Abramson 2008). The between- and within-subject percentages reveal considerable emotional volatility over time within individuals. For example, large majorities of adolescents (70% of boys and 78% of girls) reported feeling happy “never, rarely, or sometimes” in the past 2 weeks in at least one survey, and roughly half ever reported feeling sad “a lot of the time or most of the time.” Yet the vast majority also ever reported feeling happy “most of the time” and feeling sad “never or rarely.” At the within-subject level, adolescents who ever reported feeling sad “a lot of the time or most of the time” did so in up to a quarter (19% for boys and 25% for girls) of their surveys.

Partnership quality also was quite variable both between and within individuals. On average, global partnership quality was “very good” for boys and girls (means of 2.95 and 2.87, respectively). Overall means for validation (2.64 for boys and girls) and frequency of disagreements (1.71 for boys and 1.96 for girls) also indicate relatively high levels of validation and rare conflict in adolescents’ partnerships, on average, with higher levels of conflict reported by girls than boys. Nonetheless, similar between- and within-subject standard deviations across measures of partnership quality reveal both considerable variability between adolescents in average partnership quality levels as well as volatility in partnership quality within individuals (i.e., ups and downs within and across partnerships). For example, among boys, between- and within-subject standard deviations for global quality were 0.74 and 0.76, respectively.

Table 2 also provides descriptive statistics for partnership type, reported as percentages across person-surveys at the individual level (“ever” reports across surveys) and at the within-subject level (fraction of the surveys a respondent reported a relationship type, conditional on ever reporting that type). Across person-surveys, dating was the most frequently reported partnership type, followed by talking or flirting. Although all adolescents in the analysis sample reported at least one partnership during their participation in mDiary, at the respondent level (between-subjects columns), approximately three-in-four adolescents ever reported talking or flirting with someone. A similar share reported ever being in a partnership they considered dating, whereas roughly 20% ever reported friends with benefits as a relationship status.

Overall, the results in table 2 indicate high levels of variability between- and within-subjects in both affect and partnership quality, but whether and how flux in the various components of partnership quality influence emotional wellbeing is unclear. Results from the multilevel mixed-effects ordered probit models that adjusted for childhood exposures and a host of control variables address this question.

Associations Between Adolescent Partnership Quality and Negative Affect

Table 3 presents estimates of longitudinal associations between adolescent partnership quality and negative affect. Fixed and random effects for each dimension of partnership

quality (global quality, validation, and frequency of disagreements) are specified in Models 1–3; Model 4 specifies fixed and random effects for global partnership quality, while simultaneously including fixed effects for validation and frequency of disagreements.[10] The estimates of greatest substantive interest are the coefficients for the within-subject associations of each measure of partnership quality with negative affect.

In Models 1 and 2 of table 3, within- and between-person global quality and validation show statistically significant negative associations with negative affect. The within-subject results indicate that in surveys where adolescents reported higher levels of global partnership quality and partner validation than their own cross-wave averages, they also reported sadness levels below their cross-wave averages. Within- and between-person frequency of disagreement was associated with significantly higher levels of negative affect (Model 3). Model 4 reveals that the within-person results for global quality, validation, and frequency of disagreement were generally robust to the simultaneous inclusion of all three dimensions of quality. Overall, results reported in table 3 indicate that increases in partnership quality, however measured, predicted decreases in negative affect. Random effects were not statistically significant for any of the partnership quality indicators, providing no evidence of differential sensitivity to changes in quality across subjects for this outcome.

Few of the other predictors included in the models were consistently associated with negative affect. Although statistically significant associations between the childhood exposure measures and sadness were evident at the bivariate level and after inclusion of sociodemographic controls (not shown), significance waned with inclusion of the partnership quality indicators. This result suggests that these family exposures may sort adolescents into lower quality partnerships but are not directly associated with affect. Levels of baseline sadness were positively associated with sadness in the past 2 weeks. Being female was also positively associated with negative affect across the models, although the association bordered on the margins of significance in Models 3 and 4. Adolescents with college-educated mothers averaged lower levels of sadness than their peers whose mothers lacked a high school diploma.

Associations Between Adolescent Partnership Quality and Positive Affect

Table 4 presents estimates of the associations between adolescent partnership quality and positive affect. As in table 3, results reveal positive associations between adolescent partnership quality and positive affect. In Model 1, not only did adolescents with higher average partnership quality report higher average levels of happiness (as indicated by the positive between-respondent coefficient), but within-person increases in partnership quality also were associated with increases in happiness (as evidenced by the positive within-respondent coefficient). Model 2 shows similar patterns of association for between and within-person validation. Results for frequency of disagreements (Model 3) likewise reveal statistically significant between- and within-person associations with positive affect; however, negative coefficients indicate that increases in frequency of disagreement were associated with decreases in happiness. Simultaneously estimating the three indicators

[10]Including random effects for within-person quality, within-person validation, and within-person conflict simultaneously did not improve model fit.

of relationship quality did not substantively alter the results (Model 4). Overall, these results indicate that, on average, higher quality partnerships were associated with emotional wellbeing. In contrast to results predicting changes in levels of sadness, Models 3 and 4 evinced significant random effects for partnership quality, indicating some heterogeneity across adolescents in the strength of association with changes in positive affect.

As in table 3, few other predictors were significantly associated with positive affect. Adolescents in "talking/flirting" and "other" partnership types reported significantly lower levels of positive affect than those in "dating" partnerships. As with sadness, we observed significant associations between the measures of childhood family experiences and happiness with adjustments for sociodemographic controls (not shown), but most of these associations lost significance upon inclusion of the measures of partnership type and quality. Notably, Models 2–4 indicate that adolescents who experienced psychological harsh maternal parenting during middle childhood reported lower levels of happiness than their counterparts who did not. In addition, higher baseline positive affect was associated with greater happiness across all four models. Although only marginally significant in Models 3 and 4, girls averaged lower levels of positive affect compared with boys. Finally, survey wave was positively associated with positive affect, indicating a modest growth trend across surveys.

Gender as a Moderator?

Tables 5 and 6 display results from four models specified identically to tables 3 and 4 but with the addition of terms interacting partnership quality with respondent sex. Table 5 lends no support for claims that associations between partnership quality and negative affect differ on average between boys and girls. Across global quality, validation, and frequency of disagreements, none of the interaction terms with respondent sex attained statistical significance, nor did their inclusion improve model fit compared with the results reported in table 3. A similar conclusion obtains for positive affect: results show similar associations among the three relationship quality dimensions and positive affect for boys and girls across all four models (table 6). In sum, results from both sets of estimates affirm that girls and boys appear to suffer and benefit similarly from lower quality and higher quality relationships.

Robustness Checks

We conducted several checks on the robustness of the results. The first supplementary analyses (see Appendix Table 2) used first-order autoregressive models that added positive/negative affect in the previous survey as a predictor variable. This analysis estimated the influence of changes in partnership quality on changes in affect from one survey to the next. Results from these autoregressive models were substantively identical to the results presented in tables 3 and 4, providing further evidence that the causal direction of association flows from partnership quality to affect. We omitted one-survey lags from the final models to avoid missingness due to exclusion of data from surveys lacking a prior report of affect.

A second supplementary analysis investigated associations between adolescent partnership quality and a more extreme negative affect measure indicating whether respondents reported feeling that "life was not worth living" at least sometimes in the prior 2 weeks. Reflecting low incidence of extreme negative affect, coefficients were imprecisely estimated. Nonetheless, results were consistent with table 3 in that lower partnership quality was associated with an increased risk of reporting that life was not worth living (results available upon request).

As a check that our results were not specific only to the relationship measures specified, we also assessed robustness to two additional relationship constructs: (1) level of comfort talking to one's partner about a problem and (2) relationship (a)symmetry, indicated by reports of who was more "into" the relationship (respondent, partner, or about the same). Both comfort with self-disclosure and relational symmetry were significantly associated with happiness and sadness in the expected directions, akin to the results from tables 3 and 4 (see Appendix Table 3).

Two final robustness checks assessed variation by partnership type and number of partnerships. There was some evidence, albeit inconsistent, that associations between relationship quality and affect were stronger when in dating partnerships, particularly for girls (see Appendix Tables 4–7). Specifically, relative to girls in dating relationships, those in "friends w/benefits" relationships experienced less of an increase in happiness as global quality increased, and girls in "friends with benefits" and "talking or flirting" relationships experienced less of a decrease in happiness as disagreements increased (Appendix Table 5). Conversely, however, girls in "friends w/benefits" or in relationships categorized as "other" experienced more of an increase in happiness as validation increased relative to those in "dating" relationships. Appendix Table 4 shows similarly inconsistent results for negative affect. Thus, relationship quality appeared in some analyses to be more consequential to girls in dating partnerships, but this finding was inconsistent across measures of partnership quality and type. Appendix Tables 6–7 show little to no evidence of heterogeneity by partnership type for boys.

Finally, to gauge whether adolescents reporting only one partner were more reactive to the quality of that partnership, we checked robustness to restricting the analysis to respondents naming one single partner throughout their participation in mDiary. We found no evidence that this was the case (results available upon request).

Discussion

Overall, findings from the intensive longitudinal analysis affirm that partnership quality is a major source of change in both negative and positive affect among adolescents, over and above childhood exposures to harsh parenting and poor parental relationship quality, partnership type, baseline affect, and a host of sociodemographic controls. That few other factors we examined were independently associated with adolescents' emotional wellbeing underscores the salience of romantic experiences in adolescents' lives (Furman and Shaffer 2003). Lack of measurement precision in previous surveys has largely prevented direct observation of changes in adolescent relationship quality and emotional health over time,

particularly for short-lived partnerships, and precluded investigation of potential recursive links between romantic experiences and affect.

Using biweekly intensive longitudinal data collected over the course of a year—linked to six waves of birth cohort data—we examined time-varying associations between adolescents' partnership dynamics and changes in negative and positive affect. Results revealed that partnership quality, whether measured globally or specified as validation or frequency of disagreements, was associated with changes in adolescents' reported levels of both happiness and sadness, net of childhood factors that were expected to potentially select adolescents into higher or lower quality partnerships. In addition to validating prior literature linking adolescent romantic partnerships and experiences with negative emotional health (e.g., Joyner and Udry 2000; Davila 2008; Rogers et al. 2018), these results demonstrate the emotional benefits associated with involvement in high-quality partnerships (Collins 2003; Harden 2014) and also underscore the importance of examining partnership quality when assessing links between adolescents' romantic involvement and their emotional health.

We observed little evidence of differential susceptibility to changes in partnership quality by gender. Although adolescent girls reported higher average levels of negative affect and lower levels of positive affect than boys, on average there were no significant differences between boys and girls in associations between partnership quality and either positive or negative affect. This aligns with results from Rogers et al. (2018) based on intensive longitudinal data, and with results from Giordano et al.'s (2006) mixed-methods study showing that adolescent boys' emotional engagement in relationships is like that of girls. Robustness checks examining interactions between relationship quality and partnership type in models stratified by gender revealed some evidence that for girls, associations between relationship quality and affect may be stronger in dating relationships than in less serious relationships. That these results were not robust across measures of relationship quality or partnership type suggests a need for further investigation of potential variation by partnership type and gender.

Random effects gauging heterogeneity in associations between relationship quality and affect from person to person were statistically significant for models predicting happiness but not for models predicting sadness, which aligns with claims from other research that happiness and sadness are not merely transposed versions of emotions (Rafaeli and Revelle 2006). In other words, although associations between changes in relationship quality and changes in positive affect differed from subject to subject, associations between changes in relationship quality and changes in negative affect appear to be more universal. These findings suggest a need to further investigate what makes some adolescents react more positively to high-quality relationships than others.

The strengths of this study included its use of intensive longitudinal data linked to six waves of birth cohort data, its attention to potential salutary consequences of higher quality partnerships, and its consideration of possible sources of selection and of gender variation in associations between relationship quality and both positive and negative affect. Nonetheless, several data-related limitations warrant discussion. First, when assessing the external validity of the study results, analysts should consider both that the FFCWS is a sample

of adolescents born in urban areas and that the study oversampled births to unmarried mothers. In addition, small cell sizes prohibited reliably examining additional variation by ethno-racial group, socioeconomic status, or other potentially important moderators. Moreover, a relatively small number of partnerships per respondent, and observations per partnership, precluded use of three-level multilevel models to distinguish changes in quality within partnerships from changes across partnerships. Future intensive longitudinal research with adolescents should aim for larger and more nationally representative samples, assessed perhaps over a longer period, to increase external validity, to enable more detailed attention to population heterogeneity, and to allow for nesting of observations within partnerships within individuals.

Second, because mDiary's surveys were repeated at relatively close intervals, the number of survey questions was kept small to minimize respondent cognitive burden and maximize persistence in the study. This resulted in a relatively small number of variables touching on any particular construct while allowing investigation of stability and change in these measures over time. Like other intensive longitudinal studies that rarely include a comprehensive battery of questions on depressive symptoms (Rothenberg et al. 2019), mDiary lacks intensive longitudinal measures of poor emotional health beyond sadness and hopelessness. Nevertheless, that the substantive results for sadness and hopelessness were similar indicates robustness to the measure of negative affect captured by mDiary. Although the dataset also lacked a comprehensive set of relationship quality measures, results were robust to each of the three main measures of validation, conflict, and global quality, as well as measures capturing comfort discussing a problem with a romantic partner and relational asymmetry.

Third, consistent with gender differences in compliance in other longitudinal surveys (e.g., Chantala, Kalsbeek, and Andraca 2005), male mDiary participants had more missing surveys and missing partnership identifiers than female participants. However, for missing data to substantially change results on gender variation in the direction of prior research (i.e., stronger associations for girls), boys who skipped mDiary surveys and/or did not name partners would have to be less sensitive to partnership quality than others. There is no reason to believe this is the case.

This study focused on associations between relationship quality and emotional health among adolescents who reported at least one partner during their participation in the mDiary study. Given prior findings linking adolescent romantic involvement with poor emotional health (e.g., Joyner and Udry 2000; Doyle et al. 2003), it is possible that adolescents with no romantic involvement experienced lower levels of negative affect, and higher levels of positive affect, relative to their partnered peers (even those in high-quality partnerships). Assessing this would require not only distinguishing adolescents in high versus low-quality partnerships in any given survey wave, but it would also require distinguishing adolescents who named a partner in previous waves but not the current wave, those who did not name a partnership prospectively during mDiary but had been involved in a partnership previously, and those who had never partnered. Doing so would require distinct analytic methods, including a shift to dichotomizing relationship quality, and a much larger sample. Nonetheless, this is a potentially fruitful avenue for future research.

Finally, future studies should attempt to investigate both the mechanisms linking adolescent relationship quality and emotional health as well as the consequences of adolescent relationship quality for other outcomes. It is possible that the mechanisms driving associations between partnership quality and positive affect differ from those driving associations with negative affect. For example, linkages between relationship quality and positive affect have been theorized to stem from high self-esteem and a sense of belonging, whereas low-quality relationships have the capacity to produce stress and anxiety and can lead to feelings of inauthenticity and clouded identity (Collins 2003; Furman and Schaffer, 2003). Such mechanisms cannot be examined with mDiary data, however; neither is it possible to consider the influences on emotional wellbeing of social contexts other than the family, such as neighborhood and school environments. Lastly, it is also conceivable that although high-quality relationships may benefit adolescents' emotional health, even salutary romantic experiences may be detrimental for other important outcomes like school engagement (Manning et al. 2014).

For practitioners and parents, our findings underscore the importance of acknowledging the influence—positive and negative—romantic relationships exert on adolescents' development and wellbeing, and of aiming to mitigate risks while also supporting positive connections (Karney et al. 2007; Harden 2014). Programmatic and clinical efforts to encourage healthy romantic involvement might include educating adolescents on signs of healthy and unhealthy partnerships, fostering open communication on relational dynamics with parents and other adults, and taking seriously adolescents' mental health needs around poor-quality partnerships. As suggested by Karney et al. (2007), programs should also help adolescents express and understand their feelings and beliefs about relationships, help adolescents identify maladaptive patterns they have witnessed by parents or other influential adults in their partnerships, and teach adolescents how to utilize evidence-based strategies to minimize the replication of such patterns. Such programs have the potential both to improve adolescent mental health outcomes and to mitigate the replication of unhealthy patterns in later adult relationships (Cui et al. 2013).

Overall, by using intensive longitudinal data to assess the emotional consequences of adolescent romantic experiences, we heeded a call by Furman et al. (2019) to move beyond "taking snapshots" of adolescent romantic relationships to capture the dynamic nature of adolescents' relationships. Although partnership formation is developmentally normative in adolescence (Furman, Brown, and Feiring 1999), empirical work has continued to focus primarily on the risks of adolescent romance. Our findings underscore the need for a more balanced approach that allows for both positive and negative consequences of adolescent romantic involvement depending on relational dynamics within the partnership.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1.

Descriptive Results for Time-Invariant Measures, by Respondent Sex

	Boys Mean (SD)/%	**Girls Mean (SD)/%**
Baseline affect in past 2 weeks		
Felt happy		
Never, rarely, or sometimes	28.67	38.16
A lot of the time	42.66	30.92
Most of the time	28.67	30.92
Felt sad		
Never or rarely	36.36	21.74
Sometimes	48.95	56.04
A lot of the time or most of the time	14.69	22.22
Sociodemographic characteristics		
Age at baseline	16.06 (0.38)	16.17 (0.44)
Race/ethnicity		
Non-Hispanic White	27.27	28.99
Non-Hispanic Black	27.27	37.20
Hispanic/Latino	32.17	23.67
Non-Hispanic Other	3.50	2.42
Non-Hispanic Multiracial	6.29	5.80
Don’t know or missing	3.50	1.93
Mother’s completed education		
< High school diploma	22.38	24.15
High school diploma/GED	27.27	30.92
Some college/technical	32.17	31.88
BA/BS or graduate school	18.18	13.04
Mother’s poverty ratio at baseline		
0–49% of FPL	11.89	14.01
50–99% of FPL	8.39	13.53
100–199% of FPL	27.27	24.64
200–299% of FPL	13.99	12.56
300% + of FPL	38.46	35.27
Mother’s marital status at birth		
Not married or cohabitating	32.87	35.27
Married	38.46	28.02
Cohabitating	28.67	36.71
Mother’s age at time of birth	26.46 (6.65)	25.75 (6.06)
Mother US-born	85.31	84.06
Childhood family exposures Poor maternal relationship quality		

	Boys Mean (SD)/%	**Girls Mean (SD)/%**
None	67.83	59.42
Age 3 or age 5 only	20.98	25.12
Age 9 only	4.20	7.25
Early and later	6.99	8.21
Maternal psychological harsh parenting		
None	58.04	68.60
Age 3 or age 5 only	13.99	13.04
Age 9 only	11.19	8.70
Early and later	16.78	9.66
Maternal physical harsh parenting		
None	61.54	67.63
Age 3 or age 5 only	20.28	14.98
Age 9 only	9.79	7.73
Early and later	8.39	9.66
N	143 (60%)	207 (71%)

Source: mDiary Study of Adolescent Relationships Study and FFCWS

Notes: Descriptives were derived from respondents in the analytic sample predicting adolescent levels of happiness.

Table 2.

Descriptive Results for Time-Variant Adolescent Partnership and Affect Measures, by Respondent Sex

	Mean/%		Overall SD		Between-subject SD/%		Within-subject SD/%	
	Boys	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**
Affect in past 2 weeks								
Felt happy								
Never, rarely, or sometimes	22.02	28.41	—	—	69.93	77.78	33.85	39.86
A lot of the time	21.46	26.97	—	—	79.02	80.68	29.96	33.31
Most of the time	56.52	44.62	—	—	83.22	83.57	63.28	50.40
Felt sad								
Never or rarely	56.18	41.82	—	—	85.31	83.09	61.70	49.24
Sometimes	35.43	45.41	—	—	86.01	91.79	44.66	50.06
A lot of the time or most of the time	8.38	12.77	—	—	46.15	51.69	19.39	25.42
Partnership quality								
Global quality (1 = poor or fair to 4 = excellent)	2.95	2.87	1.00	1.04	0.74	0.80	0.76	0.76
Validation (1 = strongly or somewhat disagree to 3 = strongly agree)	2.64	2.64	0.54	0.55	0.39	0.38	0.42	0.43
Frequency of disagreements (1 = never to 3 = sometimes or often)	1.71	1.96	0.78	0.81	0.56	0.58	0.56	0.58
Partnership type								
Dating	61.76	65.67	—	—	69.23	75.85	69.68	71.58
Friends w/benefits	5.08	4.41	—	—	22.38	26.09	27.01	18.38
Talking/flirting	30.88	27.35	—	—	75.52	70.53	57.44	53.37
Other	2.29	2.58	—	—	14.69	18.84	15.92	17.35
n (subjects)	143	207						
N (person surveys)	2,684	4,045						

Source: mDiary Study of Adolescent Relationships

Notes: Descriptives were derived from respondents in the analytic sample predicting levels of happiness. Affect in the last 2 weeks was measured beginning in the second survey.

Table 3.

Multilevel Mixed Effects Ordered Probit Models Predicting Frequency of Sadness in Past 2 Weeks

	Model 1: Global Quality			Model 2: Validation			Model 3: Frequency of disagreements			Model 4: All		
Fixed effects	**Estimate**	***p***	**(RSE)**	**Estimate**	***p***	**(RSE)**	**Estimate**	***p***	**(RSE)**	**Estimate**	***p***	**(RSE)**
Partnership quality												
Within overall quality	−0.30	***	(0.04)							−0.24	***	(0.04)
Between overall quality	−0.40	***	(0.09)							−0.28	*	(0.11)
Within validation				−0.34	***	(0.06)				−0.13	*	(0.06)
Between validation				−0.68	***	(0.18)				−0.27		(0.23)
Within frequency of disagreements							0.27	***	(0.04)	0.22	***	(0.04)
Between frequency of disagreements							0.43	***	(0.11)	0.34	**	(0.11)
Childhood family exposures												
Poor maternal relationship quality (ref: none)												
Age 3 or age 5 only	−0.11		(0.15)	−0.10		(0.14)	−0.13		(0.15)	−0.15		(0.15)
Age 9 only	0.06		(0.26)	0.00		(0.26)	0.09		(0.27)	0.06		(0.26)
Early and later	0.06		(0.20)	0.10		(0.17)	−0.09		(0.19)	0.09		(0.20)
Maternal psychological harsh parenting (ref: none)												
Age 3 or age 5 only	−0.09		(0.21)	−0.08		(0.21)	−0.14		(0.21)	−0.14		(0.21)
Age 9 only	−0.07		(0.25)	0.05		(0.25)	0.05		(0.24)	0.02		(0.26)
Early and later	−0.08		(0.25)	−0.09		(0.25)	0.06		(0.26)	−0.06		(0.25)
Maternal physical harsh parenting (ref: none)												
Age 3 or age 5 only	−0.06		(0.18)	0.00		(0.19)	−0.05		(0.18)	−0.03		(0.18)
Age 9 only	−0.12		(0.26)	−0.20		(0.27)	−0.14		(0.27)	−0.20		(0.27)
Early and later	−0.05		(0.29)	−0.10		(0.28)	−0.12		(0.30)	−0.13		(0.30)
Partnership type (ref: dating)												
Friends w/benefits	0.06		(0.12)	0.21	†	(0.11)	0.44	***	(0.12)	0.15		(0.12)
Talking/flirting	0.01		(0.08)	0.10		(0.07)	0.32	***	(0.08)	0.10		(0.08)
Other	0.09		(0.16)	0.42	*	(0.17)	0.61	***	(0.16)	0.25		(0.17)
Baseline sadness	0.99	***	(0.10)	0.95	***	(0.10)	0.98	***	(0.10)	0.96	***	(0.10)
Survey wave	−0.01		(0.01)	−0.01		(0.01)	0.00		(0.01)	−0.01	†	(0.01)

	Model 1: Global Quality			Model 2: Validation			Model 3: Frequency of disagreements			Model 4: All		
Fixed effects	**Estimate**	***p***	**(RSE)**	**Estimate**	***p***	**(RSE)**	**Estimate**	***p***	**(RSE)**	**Estimate**	***p***	**(RSE)**
Sociodemographic characteristics												
Female	0.32	*	(0.13)	0.37	**	(0.13)	0.26	†	(0.14)	0.26	†	(0.14)
Age at baseline (months)	0.00		(0.01)	−0.01		(0.01)	−0.01		(0.01)	−0.01		(0.01)
Race/ethnicity (ref: NH White)												
Non-Hispanic Black	−0.17		(0.19)	−0.11		(0.19)	−0.01		(0.19)	−0.15		(0.19)
Hispanic/Latino	0.20		(0.20)	0.22		(0.19)	0.23		(0.19)	0.23		(0.20)
Non-Hispanic Other	−0.09		(0.32)	−0.01		(0.35)	−0.14		(0.35)	−0.02		(0.32)
Non-Hispanic Multi-racial	0.42	†	(0.23)	0.37		(0.23)	0.41	†	(0.22)	0.44	†	(0.22)
Mother's completed education (ref: < high school diploma)												
High school diploma/GED	−0.18		(0.17)	−0.18		(0.17)	−0.11		(0.17)	−0.13		(0.18)
Some college/technical	−0.18		(0.16)	−0.16		(0.16)	−0.06		(0.16)	−0.11		(0.17)
BA/BS or graduate school	−0.65	**	(0.22)	−0.54	*	(0.22)	−0.47	*	(0.24)	−0.53	*	(0.23)
Mother's poverty ratio at baseline (ref: 0–49% of FPL)												
50–99% of FPL	0.17		(0.23)	0.18		(0.24)	0.23		(0.23)	0.18		(0.23)
100–199% of FPL	0.07		(0.20)	0.10		(0.21)	0.21		(0.20)	0.18		(0.20)
200–299% of FPL	0.28		(0.25)	0.27		(0.25)	0.40		(0.25)	0.37		(0.25)
300% + of FPL	0.22		(0.22)	0.24		(0.22)	0.36		(0.22)	0.32		(0.22)
Mother's marital status at birth (ref: not married or cohabiting)												
Married	0.13		(0.20)	0.00		(0.20)	0.04		(0.21)	0.09		(0.21)
Cohabiting	0.06		(0.15)	0.05		(0.15)	0.00		(0.15)	0.03		(0.15)
Mother's age at time of birth	0.01		(0.01)	0.01		(0.01)	0.01		(0.01)	0.01		(0.01)
Mother US-born	0.09		(0.19)	0.14		(0.19)	0.08		(0.19)	0.06		(0.19)
Random effects ([co=]variances)	**Estimate**		**(RSE)**	**Estimate**		**(RSE)**	**Estimate**		**(RSE)**	**Estimate**		**(RSE)**
Intercept	0.82		(0.10)	0.79		(0.10)	0.82		(0.10)	0.81		(0.10)
Within partnership quality	0.06		(0.02)	0.12		(0.06)	0.08		(0.04)	0.06		(0.03)
Intercept & w/in partnership quality	0.05		(0.05)	0.03		(0.07)	0.00		(0.06)	0.06		(0.05)

Source: mDiary Study of Adolescent Relationships and FFCWS

Notes:

$^{*}p < 0.05$;

$^{**}p < 0.01$;

$^{***}p < 0.001$;

$^{\dagger}p < 0.10$.

Results for “missing” race/ethnicity category not shown. In Models 1–3, the random effect for “partnership quality” corresponds to the within-partnership quality measure being used in the model. In Model 4, random effects are included for only global quality, not validation and frequency of disagreements.

Table 4.

Multilevel Mixed Effects Ordered Probit Models Predicting Frequency of Happiness in Past 2 Weeks

	Model 1: Global Quality			Model 2: Validation			Model 3: Frequency of disagreements			Model 4: All		
Fixed effects	**Estimate**	***p***	**(RSE)**	**Estimate**	***p***	**(RSE)**	**Estimate**	***p***	**(RSE)**	**Estimate**	***p***	**(RSE)**
Partnership quality												
Within global quality	0.37	***	(0.04)							0.27	***	(0.04)
Between global quality	0.52	***	(0.10)							0.28	*	(0.12)
Within validation				0.58	***	(0.06)				0.34	***	(0.07)
Between validation				1.04	***	(0.19)				0.69	**	(0.25)
Within frequency of disagreements							−0.19	***	(0.05)	−0.10	*	(0.04)
Between frequency of disagreements							−0.50	***	(0.12)	−0.36	**	(0.11)
Childhood family exposures												
Poor maternal relationship quality (ref: none)												
Age 3 or age 5 only	0.01		(0.17)	−0.02		(0.16)	0.09		(0.17)	0.05		(0.16)
Age 9 only	0.01		(0.31)	0.11		(0.31)	−0.05		(0.30)	−0.04		(0.33)
Early and later	−0.24		(0.26)	−0.39		(0.24)	−0.11		(0.26)	−0.33		(0.26)
Maternal psychological harsh parenting (ref: none)												
Age 3 or age 5 only	−0.23		(0.23)	−0.23		(0.23)	−0.18		(0.23)	−0.20		(0.23)
Age 9 only	−0.44		(0.28)	−0.53	†	(0.27)	−0.53	*	(0.27)	−0.52	†	(0.28)
Early and later	−0.32		(0.28)	−0.31		(0.27)	−0.50	†	(0.29)	−0.29		(0.28)
Maternal physical harsh parenting (ref: none)												
Age 3 or age 5 only	0.07		(0.20)	0.03		(0.19)	0.08		(0.19)	0.00		(0.19)
Age 9 only	0.23		(0.28)	0.39		(0.29)	0.28		(0.28)	0.34		(0.27)
Early and later	−0.03		(0.30)	0.10		(0.30)	0.05		(0.31)	−0.01		(0.32)
Partnership type (ref: dating)												
Friends w/benefits	0.07		(0.13)	−0.06		(0.13)	−0.34	**	(0.12)	0.07		(0.14)
Talking/flirting	−0.27	**	(0.08)	−0.34	***	(0.07)	−0.57	***	(0.08)	−0.31	***	(0.08)
Other	−0.55	***	(0.15)	−0.70	***	(0.18)	−1.00	***	(0.16)	−0.61	***	(0.16)
Baseline happiness	1.07	***	(0.09)	1.05	***	(0.09)	1.09	***	(0.09)	1.04	***	(0.09)
Survey wave	0.01	*	(0.01)	0.01	*	(0.01)	0.01		(0.01)	0.01	*	(0.01)

	Model 1: Global Quality			Model 2: Validation			Model 3: Frequency of disagreements			Model 4: All		
Fixed effects	**Estimate**	***p***	**(RSE)**	**Estimate**	***p***	**(RSE)**	**Estimate**	***p***	**(RSE)**	**Estimate**	***p***	**(RSE)**
Sociodemographic characteristics												
Female	−0.32	*	(0.13)	−0.39	**	(0.13)	−0.23	†	(0.14)	−0.26	†	(0.13)
Age at baseline (months)	0.00		(0.02)	0.00		(0.02)	0.01		(0.02)	0.00		(0.02)
Race/ethnicity (ref: NH White)												
Non-Hispanic Black	−0.04		(0.21)	−0.11		(0.21)	−0.25		(0.21)	−0.09		(0.21)
Hispanic/Latino	−0.23		(0.22)	−0.29		(0.20)	−0.25		(0.21)	−0.26		(0.21)
Non-Hispanic Other	−0.36		(0.31)	−0.41		(0.31)	−0.17		(0.34)	−0.43		(0.30)
Non-Hispanic Multi-racial	−0.08		(0.30)	−0.15		(0.29)	−0.06		(0.30)	−0.13		(0.27)
Mother’s completed education (ref: < high school diploma)												
High school diploma/GED	−0.01		(0.19)	−0.02		(0.19)	−0.12		(0.18)	−0.03		(0.18)
Some college/technical	0.21		(0.20)	0.22		(0.20)	0.02		(0.19)	0.15		(0.19)
BA/BS or graduate school	0.56	*	(0.26)	0.41		(0.25)	0.34		(0.25)	0.36		(0.25)
Mother’s poverty ratio at baseline (ref: 0–49% of FPL)												
50–99% of FPL	−0.05		(0.24)	−0.03		(0.25)	0.01		(0.24)	−0.08		(0.24)
100–199% of FPL	0.33		(0.23)	0.28		(0.24)	0.20		(0.22)	0.23		(0.23)
200–299% of FPL	0.18		(0.27)	0.16		(0.27)	0.09		(0.26)	0.06		(0.27)
300% + of FPL	0.29		(0.26)	0.23		(0.25)	0.22		(0.24)	0.17		(0.25)
Mother’s marital status at birth (ref: not married or cohabiting)												
Married	−0.27		(0.23)	−0.13		(0.22)	−0.32		(0.22)	−0.14		(0.22)
Cohabiting	−0.19		(0.16)	−0.20		(0.16)	−0.16		(0.16)	−0.14		(0.15)
Mother’s age at time of birth	−0.01		(0.01)	−0.01		(0.01)	−0.01		(0.01)	−0.01		(0.01)
Mother US-born	−0.17		(0.23)	−0.29		(0.21)	−0.08		(0.23)	−0.18		(0.22)
Random effects ([co=]variances)	**Estimate**		**(RSE)**	**Estimate**		**(RSE)**	**Estimate**		**(RSE)**	**Estimate**		**(RSE)**
Intercept	1.03		(0.13)	0.97		(0.12)	1.02		(0.13)	0.94		(0.12)
Within partnership quality	0.07		(0.03)	0.18		(0.07)	0.10		(0.04)	0.06		(0.02)
Intercept & w/in partnership quality	−0.09	†	(0.05)	−0.16	†	(0.09)	0.15	*	(0.07)	−0.10	*	(0.05)

Source: mDiary Study of Adolescent Relationships and FFCWS

Notes:

$^{*}p < 0.05$;

$^{**}p < 0.01$;

$^{***}p < 0.001$;

$^{\dagger}p < 0.10$.

Results for “missing” race/ethnicity category not shown. In Models 1–3, the random effect for “partnership quality” corresponds to the within-partnership quality measure being used in the model. In Model 4, random effects are included for only global quality, not validation and frequency of disagreements.

Table 5.

Multilevel Mixed Effects Ordered Probit Models Predicting Frequency of Sadness in Past 2 Weeks, with Gender Interactions

	Model 1: Global Quality			Model 2: Validation			Model 3: Frequency of disagreements			Model 4: All		
Fixed effects	**Estimate**	***p***	**(RSE)**	**Estimate**	***p***	**(RSE)**	**Estimate**	***p***	**(RSE)**	**Estimate**	***p***	**(RSE)**
Survey wave	−0.01		(0.01)	−0.01		(0.00)	0.00		(0.01)	−0.01		(0.01)
Female	0.34		(0.23)	0.36	**	(0.13)	0.33	*	(0.14)	0.29		(0.28)
Partnership quality												
Within overall quality	−0.36	***	(0.06)							−0.32	***	(0.07)
Between overall quality	−0.40	**	(0.14)							−0.22		(0.21)
Within validation				−0.46	***	(0.10)				−0.20	†	(0.10)
Between validation				−0.72	**	(0.28)				−0.43		(0.41)
Within frequency of disagreements							0.20	**	(0.06)	0.17	**	(0.06)
Between frequency of disagreements							0.22		(0.17)	0.10		(0.19)
Partnership quality interacted with sex												
Within global quality × female	0.09		(0.07)							0.12		(0.08)
Between global quality × female	0.00		(0.18)							−0.08		(0.24)
Within validation × female				0.16		(0.12)				0.10		(0.13)
Between validation × female				0.07		(0.36)				0.23		(0.49)
Within frequency of disagreements × female							0.10		(0.08)	0.08		(0.08)
Between frequency of disagreements × female							0.34		(0.21)	0.37		(0.23)
Random effects ([co=]variances)	**Estimate**		**(RSE)**	**Estimate**		**(RSE)**	**Estimate**		**(RSE)**	**Estimate**		**(RSE)**
Intercept	0.82		(0.10)	0.80		(0.10)	0.82		(0.10)	0.81		(0.10)
Within partnership quality	0.06		(0.02)	0.11		(0.06)	0.08		(0.04)	0.06		(0.03)
Intercept & w/in partnership quality	0.05		(0.05)	0.03		(0.07)	−0.01		(0.06)	0.07		(0.05)

Source: mDiary Study of Adolescent Relationships and FFCWS

Notes:

* $p < 0.05$;

** $p < 0.01$;

*** $p < 0.001$;

$^{\dagger}p < 0.10$.

All models also include the same control variables as in Table 2 (not shown). In Models 1–3, the random effect for “partnership quality” corresponds to the within-partnership quality measure being used in the model. In Model 4, random effects are included for only global quality, not validation and frequency of disagreements.

Table 6.

Multilevel Mixed Effects Ordered Probit Models Predicting Frequency of Happiness in Past 2 Weeks, with Gender Interactions

	Model 1: Global Quality			Model 2: Validation			Model 3: Frequency of disagreements			Model 4: All		
Fixed effects	**Estimate**	***p***	**(RSE)**	**Estimate**	***p***	**(RSE)**	**Estimate**	***p***	**(RSE)**	**Estimate**	***p***	**(RSE)**
Survey wave	0.01	*	(0.01)	0.01	*	(0.01)	0.01		(0.01)	0.01	*	(0.01)
Female	−0.24		(0.24)	−0.36	**	(0.13)	−0.22		(0.14)	−0.12		(0.29)
Partnership quality												
Within global quality	0.37	***	(0.07)							0.24	**	(0.07)
Between global quality	0.47	**	(0.16)							0.20		(0.20)
Within validation				0.71	***	(0.11)				0.49	***	(0.12)
Between validation				1.00	**	(0.29)				0.65	†	(0.38)
Within frequency of disagreements							−0.20	*	(0.08)	−0.16	*	(0.08)
Between frequency of disagreements							−0.50	**	(0.18)	−0.38	*	(0.18)
Partnership quality interacted with sex												
Within global quality × female	0.00		(0.08)							0.05		(0.08)
Between global quality × female	0.07		(0.19)							0.12		(0.24)
Within validation × female				−0.19		(0.13)				−0.22		(0.15)
Between validation × female				0.07		(0.37)				0.07		(0.48)
Within frequency of disagreements × female							0.02		(0.08)	0.08		(0.10)
Between frequency of disagreements × female							−0.01		(0.23)	0.04		(0.23)
Random effects ([co=]variances)	**Estimate**		**(RSE)**	**Estimate**		**(RSE)**	**Estimate**		**(RSE)**	**Estimate**		**(RSE)**
Intercept	1.04		(0.13)	0.97		(0.12)	1.02		(0.13)	0.95		(0.12)
Within partnership quality	0.07		(0.03)	0.17		(0.07)	0.10		(0.04)	0.06		(0.02)
Intercept & w/in partnership quality	−0.09	†	(0.05)	−0.17	†	(0.09)	0.15	*	(0.07)	−0.11	*	(0.05)

Source: mDiary Study of Adolescent Relationships and FFCWS

Notes:

* $p < 0.05$;

** $p < 0.01$;

*** $p < 0.001$;

$^{\dagger}p < 0.10$.

All models also include the same control variables as in Table 4 (not shown). In Models 1–3, the random effect for “partnership quality” corresponds to the within partnership quality measure being used in the model. In Model 4, random effects are included for only global quality, not validation and frequency of disagreements.