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Heterosexual Romantic Involvement and Depressive Symptoms in Black Adolescent Girls: Effects of Menarche and Perceived Social Support

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Abstract

Research has accumulated to demonstrate that depressive symptoms are associated with heterosexual romantic involvement during adolescence, but relatively little work has linked this body of literature to the existing literature on associations between early pubertal timing and adolescent depressive symptoms. This study extends prior research by examining whether early menarche and heterosexual romantic involvement interact to predict depressive symptoms in a national sample of Black adolescent girls ($N = 607$; M age = 15 years; 32 % Caribbean Black and 68 % African American). We further examined whether the adverse effects of heterosexual romantic involvement and early menarche would be mediated by perceived social support from mothers, fathers, and peers. Path analysis results indicated that girls who report current involvement in a heterosexual romantic relationship also reported high levels of perceived peer support than girls with no romantic involvement. High levels of perceived peer support, in turn, predicted low levels of depressive symptoms. Romantically involved girls with an early menarche also reported significantly less depressive symptoms than girls not romantically involved with an early menarche. Neither perceived maternal support nor perceived paternal support mediated

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associations between heterosexual romantic involvement, menarche, and depressive symptoms. The findings suggest that individual and social factors can impede heterosexual romantic involvement effects on depressive symptoms in Black adolescent girls.

Keywords

Depressive symptoms; Menarche; Perceived social support; Romantic involvement

Introduction

Research has accumulated to demonstrate that depressive symptoms are associated with heterosexual romantic involvement during adolescence among girls (see, Davila 2008, for a review). Joyner and Udry (2000), for example, examined change in levels of depression over a 1-year period for adolescent boys and girls with and without romantic involvement (ages 12–17 years; $N = 8,181$; 53 % girls; no race/ethnicity reported). The findings demonstrated that adolescent boys and girls who became romantically involved with the opposite-sex reported larger increases in depressive symptoms than their counterparts who did not. Additionally, adolescent girls experienced a larger increase in depression than adolescent boys in response to heterosexual romantic involvement. In a cross-section study of adolescent girls, Davila et al. (2004) demonstrated that girls who reported current or past involvement in a romantic relationship reported greater depressive symptoms than girls with no romantic involvement (M age = 13 years; $N = 96$; 91 % White).

Relatively little work, however, has linked the body of literature on heterosexual romantic involvement and depressive symptoms to the existing literature on associations between early pubertal timing and depressive symptoms in adolescent girls (Compian et al. 2004; Natsuaki et al. 2009; Stroud and Davila 2008; Benoit et al. 2013; Llewellyn et al. 2012). There are several compelling reasons to examine the impact of puberty on associations between heterosexual romantic involvement and depressive symptoms. First, romantic involvement develops against a backdrop of simultaneous changes occurring in a number of major domains of an adolescent girl's life. One such domain is pubertal development. The timing of pubertal development has been linked to interest in the opposite sex and dating (Friedlander et al. 2007; Ivanova et al. 2012; Cavanagh 2004; Halpern et al. 2007).

Adolescent girls' who develop early seek out friends whom they perceive as similar to themselves in physical maturation such as older adolescents (Stattin et al. 2011). Because older adolescents are more likely to form a romantic relationship with the opposite sex than younger adolescents (Carver et al. 2003), early developers who affiliate with older adolescents are exposed to a wide range of social opportunities where they can interact with the opposite-sex, such as mixed-gender activities and outings. The greater the amount of opposite-sex interactions, the more likely it is that an early developing girl will develop a romantic relationship (Connolly and Johnson 1996; Connolly et al. 2000). Thus, the normal process of developing romantic relationships in adolescence will come earlier for early developing girls.

Second, the timing of menarche may have a particularly salient meaning in the context of heterosexual romantic involvement given its implications for reproductive maturity. Research has demonstrated that the transition and timing of menarche may create heightened stress for girls as they adjust to the new identity and expectations associated with menarche (Ruble and Brooks-Gunn 1982; Natsuaki et al. 2011). As such, the relationship between heterosexual romantic involvement and adolescent depressive symptoms might be best accounted for by the co-occurring changes associated with maturation. How these changes interact may have important implications for understanding depression in the context of heterosexual romantic involvement among girls. This represents the primary aim of the current study.

In this study, associations between heterosexual romantic involvement, depressive symptoms, and pubertal development (i.e., menarche) were examined in a national sample of Black adolescent girls (i.e., African American and Caribbean Black). We used a national sample of Black adolescent girls because research on associations between heterosexual romantic involvement and depressive symptoms has almost exclusively focused on White adolescent girls (see Davila 2008, for a review). Because cultural values and attitudes regarding sexuality likely influence the onset, frequency, and timing of romantic relationships (Connolly and McIsaac 2011), improved understanding about the nature of the link between heterosexual romantic involvement and depressive symptoms within this population is needed. A further reason to improve understanding about the link stems from research indicating that the changes associated with puberty tends to occur earlier in Black adolescent girls than other racial/ethnic groups (Herman-Giddens et al. 1997; Wu et al. 2002). African American girls begin puberty about 1–1.5 years earlier than European American girls and begin menses about 8.5 months earlier (Herman-Giddens et al. 1997). Thus, Black adolescent girls may be a particularly vulnerable group of youth given the specific stressors they face in response to experiencing pubertal changes earlier than other racial/ethnic groups.

Considering the aforementioned, a second purpose of the present study was to better understand the underlying relationship between heterosexual romantic involvement, pubertal development, and depressive symptoms by examining the mediating role of perceived social support from mothers, fathers, and peers. Perceived social support, operationalized with respect to the quality of a given relationship, is one of the most robust concurrent predictors of depressive symptomology (see Hammen 2006, for a review). Because the transition to dating and the role restructuring that accompanies this transition can be distressing to some adolescent girls (Aneshensel 1992; Slotter et al. 2010), perceived social support may be a significant part of the process of moving from being romantically involved to being depressed.

Menarche and Adolescent Depressive Symptoms

Research has demonstrated that early menarche is a significant risk factor for the development of depressive symptoms during adolescence (see Negri and Susman 2011, for a review). Stice et al. (2001), for example, examined associations between early menarche and depression in a sample of adolescent girls ($N = 496$; ages 11–15 years; 68 % White).

Their study's results demonstrated that early menarche (before 11.6 years) was associated with elevated depressive symptoms and increased risk for a diagnosis of depression. Similarly, Kaltiala-Heino et al. (2003) demonstrated that girls who experienced menarche at 10 years or younger showed higher levels of depressive symptoms compared to girls who experienced menarche at 11 years or older ($N = 17,082$; ages 14–16 years).

Experiencing early pubertal transition in adverse contexts has been hypothesized to increase the risk for adolescent depression (Ge and Natsuaki 2009). Adverse contexts, such as stressful life events or interpersonal challenges, can trigger latent vulnerability conferred by early pubertal timing to result in increased depressive symptoms for early developers. Ge et al. (2001), for example, found that early developing girls with more recent stressful life events had higher levels of depressive symptoms than their on-time or late developing peers (either male or female). It is possible, therefore, that involvement with the opposite sex may be particularly stressful for adolescent girls who negotiate an early pubertal transition because new challenges at the entry to puberty and a widening array of social stressors may overtax their relatively undeveloped coping resources.

Perceived Social Support and Adolescent Depressive Symptoms

Several studies have demonstrated that perceived social support from various sources is related to depressive symptoms in adolescents (Oppedal et al. 2004; Undheim and Sund 2005; Rubin et al. 2004). The perception that one is accepted and valued in one's interpersonal social environment bolsters self-esteem, confidence, and self-efficacy, which guard against depression. To date, the majority of adolescent social support research has relied on diathesis-stress models (e.g., Bogard 2004; Crocker and Hakim-Larson 1997; Ellonen et al. 2008; Auerbach et al. 2011; Stice et al. 2004). In general, research has demonstrated that lower levels of perceived social support are associated with higher levels of depressive symptoms in adolescents. Moreover, particular types of helpers play a differential support role with respect to the manifestation of depressive symptomology (e.g., Zhang et al. 2014; Bogard 2004; Raffaelli et al. 2013; Stice et al. 2004). Stice et al. (2004), for example, found that lower parental, but not peer support, predicted increases in depressive symptoms as well as the onset of major depression following the occurrence of stress.

However, perceived social support may or may not necessarily be limited to a role of moderating or stress buffering (Hammen 2006). Rather, the role of perceived social support may be multidimensional and involve differential mechanisms when it comes to relationships between heterosexual romantic involvement and adolescent depressive symptoms. To better understand circumstances in which the relationship between perceived social support and depressive symptoms may be particularly strong, researchers have begun to employ transactional models, which incorporate a stress generation framework, to conceptualize vulnerability to depression among adolescents (e.g., Eberhart and Hammen 2010; Flynn et al. 2010; Auerbach et al. 2011; Wingate and Joiner 2004). The transactional approach posits that individuals actively contribute to the occurrence of stressors they experience through a process labeled stress generation (Hammen 2006). For example, adolescent girls who possess fewer social supports likely rely more heavily on specific

relationships, which may burden and tax these select individuals and thereby contribute to interpersonal stress. Such stress generation may then contribute to higher levels of depressive symptoms.

In the context of heterosexual adolescent romantic involvement, research has demonstrated that, when parents are unavailable to help adolescents regulate emotions and cope with the stress of romantic experiences, adolescents may fail to develop such skills and be more vulnerable to depressive symptoms (Doyle et al. 2003; Steinberg and Davila 2008). Thus, deficits in parental support may be more damaging than deficits in peer support, at least during adolescence, because parental support is more consistent than peer support—the latter may vary as the composition of peer networks shifts, or peers may be more likely to oscillate between acceptance and rejection. Consistent with the transactional approach, we examined whether perceived social support mediated associations between early menarche, heterosexual romantic involvement and depressive symptoms and whether its mediating effect differed by type of helper (i.e., maternal, paternal, or peer).

The Present Study

This study extends prior research by examining whether menarche and heterosexual romantic involvement interact to predict depressive symptoms in a national sample of African American and Caribbean Black adolescent girls. The hypothesized relationships are presented in the path diagram in Fig. 1. Based upon prior research, we hypothesized that adolescent girls who report current involvement in a heterosexual romantic relationship would experience greater depressive symptoms than adolescent girls with no romantic involvement (see path a). Adolescent girls who report early menarche were also hypothesized to experience greater depressive symptoms than adolescent girls who report a later menarche (see path b). Support for this hypothesis stems from prior research indicating girls who experience menarche at 10 years or younger report higher levels of depressive symptoms compared to girls who experience menarche at 11 years or older (Kaltiala-Heino et al. 2003). We further speculated that heterosexual romantic involvement would interact with menarche to predict high levels of depressive symptoms (see path c). Such that girls who have an early menarche and are romantically involved will report high levels of depressive symptoms.

Lastly, we hypothesized that perceived social support would mediate associations between heterosexual romantic involvement, menarche, and depressive symptoms (see paths d–f). First, it was hypothesized that romantically involved girls with highly supportive parents will feel less depressed than their counterparts because parental support is more consistent than peer support (e.g., Doyle et al. 2003). Second, we hypothesized that girls who report an early menarche with fewer social supports will feel more depressed than their counterparts because the transition and timing of menarche may create heightened stress for girls as they adjust to the new expectations associated with menarche (e.g., Natsuaki et al. 2011). As such having more social support during this time will lessen the stress generated by the onset of menarche, and any subsequent depressed feelings. Lastly, it was hypothesized that romantically involved girls with an early menarche with fewer social supports will feel more depressed. Although perceived social support and early menarche is not likely to be the

entire route, the present study will tell us whether these factors are a significant part of the process of moving from being romantically involved to being depressed.

Method

Participants

The analysis used data from the National Survey of American Life Adolescent sample (NSAL-A). The NSAL-A is a supplemental sample of 1,170 adolescents (52 % female) who were attached to the adult households in the NSAL parent study. The NSAL parent study was part of the National Institute of Mental Health (NIMH) Collaborative Psychiatric Epidemiology Surveys initiative that included three nationally representative surveys: the NSAL, the National Comorbidity Survey Replication, and the National Latino and Asian American Study (Colpe et al. 2004). The NSAL parent study provides a comprehensive study of Black Americans with an emphasis on mental disorders, stressors, and risk/resilient factors (Jackson et al. 2004). It consists of a nationally representative household survey of 3,570 African Americans and 1,621 Blacks of Caribbean descent aged 18 years and older (Jackson et al. 2004).

It should be noted that African American is used in the both the NSAL and NSAL-A to describe people who self-identified as Black but did not identify ancestral ties to the Caribbean. Caribbean Blacks are people who self-identified as Black and indicated that they were from a country included on a list of Caribbean area countries presented by the interviewers or specified that at least one of their parents or grandparents was born in a Caribbean area country.

The present study used data from only the female adolescents in the NSAL-A ($N = 607$). The sample consists of 412 African American and 195 Caribbean Black girls ages 13–17 years old ($M = 15$ years; $SD = 1.40$). Ninety-seven percent of the sample was enrolled in school. The median education level of the sample's mothers was 12th grade ($SD = 2.22$). The mean family income was approximately \$38,000 ($SD = 39,936.55$). Contingency table and analysis of variance were performed to examine potential differences between girls romantically involved and girls not romantically involved on social and demographic information provided by the adolescent and the adult respondent for the household in which the adolescent lived for the year prior to the adult interview, see Table 1. Romantically involved girls were significantly older than girls not romantically involved. No other statistically significant differences were found on the social and demographic information.

Procedure

The NSAL parent and adolescent study received institutional review board approval from the University of Michigan and was administered by the staff of the Survey Research Center at the University of Michigan. Data were collected from February 2001 to June 2003. Every household that included an adult participant in the NSAL was screened for an eligible adolescent living in the household, and adolescents were selected using a random selection procedure. If more than one adolescent was eligible for the study, up to two adolescents were selected based on the sex of the first selected adolescent to prevent oversampling of

one gender. Two youth were only selected if there was an eligible male and female adolescent in the household. If multiple youth were eligible per household, youth were randomly selected based on a sampling selection table. After weighting the data to correct for multiple youth per household, this sampling strategy resulted in a nationally representative sample of African American and Caribbean Black adolescents for the NSAL-A.

Before the interview, informed consent was obtained from the adolescent's legal guardian and agreement to participate was obtained from the adolescent. Most of the adolescent interviews were conducted face-to-face using a computer-assisted instrument in their homes, and approximately 18 % were conducted either entirely or partially by telephone. The interviewers were trained Survey Research Operations (SRO) staff at the Survey Research Center, the Institute for Social Research at the University of Michigan; four interviewer training sessions were held over the 14 month course of the study. The African American adolescent interviews averaged 1 h 40 min in length, and Caribbean Black adolescent interviews averaged 1 h 50 min. Respondents were paid \$50 for their participation in the study; the overall response rate was 80.6 % (80.4 % for African Americans and 83.5 % for Caribbean Blacks).

Measures

Depressive Symptoms—Adolescents were administered the 12-item version of the Center for Epidemiologic Studies Depression scale (CES-D; Radloff 1977; CES-D12; Roberts and Sobhan 1992). The CES-D is a well-validated and widely used self-report instrument developed to measure symptoms of depression within community samples. Adolescents responded to each question on a 4-point scale, ranging from 0 (rarely or none of the time) to 3 (most or all the time). The CES-D12 yields a total score that can range from 0 to 36, with scores 9 or more indicating high depressive symptoms. The CES-D 12 has been shown to have adequate reliability and validity (Roberts and Sobhan 1992; Roberts et al. 1991), and a coefficient alpha of 0.64 has been reported for a sample of African American adolescents (Roberts and Sobhan 1992). In the present sample, the coefficient alpha (weighted) was 0.69.

Menarche—Age of first menstruation was measured to assess pubertal development. Adolescents were asked: "How old were you when you had your first menstrual period?" Adolescents responded to this question either by providing the age of their first menstrual period or by indicating that they had never had a menstrual period. Of the total sample, 578 girls reached menarche and indicated a specific age. The girls' self-reported menarche ranged from 7 to 16 years. Twenty-nine girls indicated they had not reached menarche (18 of the 29 girls were 13 years old, 1 was 14 years old, 8 were 15 years old and 2 were 17 years old). We recoded menarche so that higher scores indicated earlier age and lower scores indicated later age or not reached menarche at the time of assessment (0 = no menarche to 11 = 7 years). Other studies have demonstrated that adolescent girls tend to be accurate in reporting their menstrual age (e.g., Caspi and Moffitt 1991; Graber et al. 1997).

Perceived Social Support: Emotional and Instrumental—Maternal and paternal support variables were created by asking the adolescents to indicate the extent to which they agreed or disagreed (1 = strongly agree, 2 = agree, 3 = neither agree or disagree, 4 = disagree, 5 = strongly disagree) with the following statements separately for the woman and man who raised them: (1) “My mother/father is always there when I need her”, (2) “I feel I can tell my mother/father just about everything”, (3) “I feel that my mother/father and I can share our problems with each other”, (4) “I feel that my mother/father and I can share our feelings with each other”, (5) “My mother/father and I are much closer than most mothers/fathers and daughters”, (6) “I have a lot of respect for my mother/father”. The responses were then reverse coded and the scales of maternal and paternal emotional support were calculated by taking the mean of any four non-missing variables in the series.

In the present sample, the range for maternal emotional support was 1.00–5.00 and had high internal consistency (Cronbach’s Alpha = 0.89). Similarly, paternal emotional support in the present study was measured on a range of 1.00–5.00 and also had high internal consistency (Cronbach’s Alpha = 0.92). Peer support was created by asking respondents (1) how often friends made them feel loved, (2) how often friends listened to them talk about private problems and concerns, (3) how often friends expressed interest and concern in their well-being, (4) how often they provided transportation, and (5) how often friends helped the respondent financially. The adolescents could respond 1 = Very often, 2 = Fairly often, 3 = Not too often, and 4 = Never. Responses were reverse coded and the peer support scale, which represents both emotional and instrumental support, was calculated by taking the mean of the responses. In the present study, the range of peer support was 1.00–4.00 and had high internal consistency (Cronbach’s Alpha = 0.72).

Heterosexual Romantic Involvement—Romantic relationship status was used to assess romantic involvement. Participants were asked whether they had a current boyfriend at the time of the assessment (1 = yes, 0 = no). Two-hundred and fifty-six girls reported a current relationship. The average length of these relationships was 36 months, suggesting that the relationships reported by the participants are more than fleeting (in terms of length).

Control Variables

Two variables were used as covariates in the study analyses: adolescents’ body mass index (BMI) and adolescents’ age in years. BMI was used as a covariate because of the weight gain associated with the onset of menarche. A measure of BMI was created according to the formula devised by the Belgian polymath Adolphe Quetelet and is defined as the individuals’ body mass divided by the square of their height multiplied by a constant (Eknoyan 2008). Specifically, the formula was applied as follows: $BMI = (\text{mass})/(\text{height})^2 \times 703$ where mass was measured in pounds, height was measured in inches and 703 was the factor for UK/US units. Adolescents were asked their age at the time of the interview in years.

Data Analysis Plan

The NSAL-A employed a stratified and clustered sample design. Sampling weights were created to adjust for variation in probabilities of selection within households, non-response

rates for households, and non-response rates for individuals. The weighted data were post-stratified to national population distributions for sex (males and females) and age (13, 14, 15, 16, and 17 years) subgroups among black youth. We conducted weighted analyses using *Mplus* 6.1 (Muthén and Muthén 2010). To calculate the complex design-based estimates of variance, we employed the robust maximum likelihood estimator (MLR), to make the Chi square test and standard errors robust to non-normality (Yuan and Bentler 1998), using Full-Information Maximum Likelihood (FIML) estimation to account for missing data. There were small amounts of missing data, occurring sporadically and never exceeding more than 4 % of the cases for all key study variables.

Path analysis was used to examine the hypothesized relations among heterosexual romantic involvement, menarche, perceived social support, and adolescent depressive symptoms. Heterosexual romantic Involvement was reflected in the model by a dummy variable scored as 1 = Have boyfriend and 0 = Do not have boyfriend. In the model, Menarche was mean centered to avoid problems with multicollinearity and to make the coefficients more interpretable (Jaccard et al. 1990). A Heterosexual Romantic Involvement X Menarche product term was included in the model to examine whether the relation between heterosexual romantic involvement and depressive symptoms varied by age of menarche. The mean centered scores for Menarche were used to create the product term. Depressive Symptoms was represented in the model by using the total score of the CES-D 12. Perceived Social Support was represented in the model using the three total sum scores of the Maternal, Paternal, and Peer support items, each representing a distinct construct of social support. The fit of the data was evaluated using multiple indicators of model fit: Chi-square, the CFI, and the root mean squared error of approximation (RMSEA). Hu and Bentler (1999) suggest CFI values close to 0.95 or greater and RMSEA values close to 0.08 or below represent acceptable model fit.

Prior to the study analyses, the data for the continuous variables were assessed using model based outlier analysis with a limited information approach in which the endogenous variables were regressed onto relevant predictors and then standardized dfbetas were examined for each individual. An outlier was defined as any individual with an absolute standardized dfbeta >1 for a given coefficient. No outliers were found based on this analysis. Examination of univariate indices of skewness and kurtosis revealed no absolute skewness or kurtosis values >1.08.

Results

Descriptive Analyses

Tables 2 and 3 present bivariate correlations between the study variables and means and standard errors for the study variables by heterosexual romantic relationship status. Mean menarche for romantically involved and non-romantically involved girls was 11.90 and 12.08, respectively. Statistically significant differences were found for perceived peer support ($p < 0.05$). Romantically involved girls reported significantly more emotional and instrumental support from peers than girls not romantically involved ($\eta^2 = .002$).

Path Analysis

Given that only 16 Caribbean Black adolescent girls indicated being in a heterosexual romantic relationship we were unable to examine ethnic subgroup differences. Thus, the two groups (African Americans and Caribbean Blacks) were pooled to maximize statistical power. A variant of the theoretical model in Fig. 1 was tested, differing from it in the following ways: (1) adolescents' age in years and BMI were included in the model as covariates for all endogenous variables, (2) covariance was included between BMI, menarche, and the heterosexual romantic Involvement X menarche product term, (3) covariance was included between adolescents' age in years, heterosexual romantic involvement, and the heterosexual romantic involvement X menarche product term, (4) correlated errors between maternal support, paternal support, and peer support were permitted to reflect that their association is not simply a function of the exogenous variables in the model.

The model yielded a good fit to the data [$\chi^2(6) = 7.435, p = 0.28$; CFI = 0.98, RMSEA = 0.02 95 % CI 0.000–0.06]. More focused tests of fit revealed no theoretically meaningful or sizable modification indices, nor were any of the absolute standardized residuals larger than 1.96. As shown in Fig. 2, there was a significant effect for Heterosexual Romantic Involvement (mean difference = 0.17; $p < 0.05$); romantically involved black girls, on average, reported more support from their peers than girls not romantically involved. High perceived peer support, in turn, significantly predicted less depressive symptoms ($B = -0.99$; $p < 0.05$). These findings collectively suggest that heterosexual romantically involved girls with highly supportive peers report lower levels of depressive symptoms than girls not romantically involved. High maternal emotional support ($B = -1.33$; $p < 0.05$) was also significantly associated with low levels of depressive symptoms; however, girls did not differ significantly on maternal support as a function of heterosexual romantic involvement. Perceived paternal emotional support did not significantly predict depressive symptoms nor was it associated with heterosexual romantic involvement.

The heterosexual romantic involvement X menarche interaction term also significantly predicted depressive symptoms ($B = -0.72$; $p < 0.05$). On average, a 1 year increase in menarche was associated with a .72 decrease in depressive symptoms in heterosexual romantically involved girls. As displayed in Fig. 3, heterosexual romantically involved girls with an early menarche (age 8 years or younger) reported less depressive symptoms compared to adolescent girls not romantically involved with an early menarche.

Discussion

Research has accumulated to demonstrate that depressive symptoms are associated with heterosexual romantic involvement during adolescence, but relatively little work has linked this body of literature to the existing literature on associations between early pubertal timing and adolescent depressive symptoms. This study extends prior research by examining whether early menarche and heterosexual romantic involvement interact to predict depressive symptoms in a national sample of Black adolescent girls. Overall, our findings suggest that early menarche and perceived peer support (both emotional and instrumental) are important to better understand the associations between heterosexual romantic

involvement and depressive symptoms. Specifically, Black adolescent girls who report current involvement in a heterosexual romantic relationship also reported higher levels of perceived peer support than girls with no romantic involvement. High levels of perceived peer support, in turn, predicted lower levels of depressive symptoms. These findings collectively suggest heterosexual romantically involved Black adolescent girls with highly supportive peers report low levels of depressive symptoms.

Neither perceived maternal emotional support nor perceived paternal emotional support mediated associations between heterosexual romantic involvement and depressive symptoms. These findings are inconsistent with our expectations and prior research (Doyle et al. 2003; Steinberg and Davila 2008). It is possible that this reliance on peers relative to parents coincides with expected changes in social relationships during adolescence. Past research on social relationships during adolescence suggests that the source of social support goes through a great deal of change: adolescents' need for support, closeness and intimacy with parents for personal issues, like romantic relationships, declines as adolescent friendships become more intimate, disclosing and supportive (Furman and Buhrmester 1992).

Our findings also demonstrated that heterosexual romantically involved Black adolescent girls with an early menarche (age 8 years or younger) report less depressive symptoms compared to their counterparts not romantically involved with an early menarche. This finding is counter to our expectations and theoretical views that experiencing an early pubertal transition in an adverse context, such as the stress of heterosexual adolescent romantic involvement, would increase depressive symptoms (Ge and Natsuaki 2009). Perhaps learning to manage menarche from an earlier age provides Black adolescent girls in this study with a level of resiliency that may be protective when confronted with stresses involving romantic partners.

Additionally, there may be some perceived benefits to developing early. Pubertal development likely exposes Black adolescent girls to a wide range of social opportunities where they can interact with the opposite-sex, such as mixed-gender activities and outings. The greater the amount of opposite-sex interactions, the more likely it is that one will develop a romantic relationship (Connolly and Johnson 1996; Connolly et al. 2000). Thus, it is possible that Black adolescent girls enter adolescence in a social context with stronger motivations to develop romantic relationships with the opposite-sex. Cultural values and attitudes regarding sexuality are distilled through experiences in everyday social contexts. These interactions within families, peer groups, and other daily contexts likely influence whether and when an adolescent girl will become romantically involved with the opposite-sex.

There are several study limitations that should be noted. First, the study relied primarily on self-reports to assess menarche. Although most studies in this area of research have used adolescent self-report data to assess menarche, there is potential for a girl's concerns to influence her assessment of her onset of menarche. Research has demonstrated that girls' affective response to menarche is related to how prepared the girls felt for the event (Ruble and Brooks-Gunn 1982). Thus, a girl may report an early menarche not only because it

reflects her status relative to other girls with the same chronological age, but because it reflects her lack of developmental readiness for menarche. Future studies should examine the ways in which the physical and hormonal changes associated with menarche are made meaningful to Black adolescent girls.

Additionally, future research on ethnic subgroup differences and pubertal-related effects might consider assessing hormonal changes at puberty. There is some evidence that the emergence of depressive symptoms is associated with the rise of gonadal hormones in girls and that this association may be independent of the psychosocial effects of puberty (see Sanborn and Hayward 2003, for a review). Second, the present study was cross-sectional and causal conclusions are not possible. Lastly, it is possible that other factors not measured in this study could have accounted for variance when interacting with menarche and perceived social support. Davila et al. (2004), for example, demonstrated that preoccupied relational style renders adolescents vulnerable to depression when in a romantic relationship. Thus, future research should consider other individual characteristics that may influence associations between heterosexual romantic involvement and adolescent depression.

Conclusion and Future Directions

Our results suggest that individual and social factors can either facilitate or impede heterosexual romantic involvement effects on depressive symptoms possibility through the opportunities and cultural norms and expectations that have relevance to Black adolescent girls' social interactions. Black adolescent girls in our study appear to rely heavily on the support of their peers as they negotiate the challenges associated with being romantically involved with the opposite-sex. Moreover, learning to manage menarche from an earlier age may provide Black adolescent girls in this study with a level of resiliency that may be protective in interactions with the opposite sex. Black adolescent girls, therefore, may be less distressed by the hormonal changes and weight gain associated with the onset of menarche. More research is needed to better understand how important or salient menarche is to Black adolescent girls and whether variations in the timing and transition of menarche translates into a risk (or not) for emotional problems in the context of heterosexual romantic involvement.

It is important to note that we were unable to examine whether ethnic subgroup membership moderated the predictive effects of menarche, heterosexual romantic involvement, and perceived social support on depressive symptoms because only 16 Caribbean Black adolescent girls indicated being in a romantic relationship. Examining ethnic subgroup differences within the Black population in the United States is important because Black Americans comprise of individuals of varied primary languages, countries of origin, history, and cultural beliefs and socialization practices (Hopp and Herring 1999). These differences may influence the meaning that adolescent girls attribute to the physical and hormonal changes associated with menarche (Carter et al. 2011); as well as expectations of the timing of first romantic involvement. The small number of romantically involved Caribbean Black adolescent girls may reflect different cultural practices concerning the appropriate age for heterosexual contact or a function of tighter controls among immigrant parents. Future

comparative studies are needed to examine the influence of parenting in Black adolescent girls within the context of our conceptual model.

No study, to date, has examined the effects of menarche and perceived social support on depressive symptoms in a multivariate analysis to understand associations between heterosexual romantic involvement and depressive symptoms in Black adolescent girls. This focus is important because our results suggest that individual and social factors can either facilitate or impede heterosexual romantic involvement effects on depressive symptoms possibility through the opportunities and cultural norms and expectations that have relevance to Black adolescent girls' social interactions.

Biographies

Rona Carter is an Assistant Professor in the Department of Psychology at the University of Michigan. She received her Ph.D. in applied developmental psychology at Florida International University, Miami, Florida. Her research explores how social-cultural contextual factors and wider social systems exacerbate or ameliorate the risks associated with pubertal timing.

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Fig. 1.
Theoretical model

Fig. 2.

Select path coefficients of the effects of heterosexual romantic involvement, menarche, and perceived social support on Black adolescent girls' depressive symptoms. *Note* Standardized path coefficients are in parentheses; * $p < .05$; Data have been weighted to be nationally representative. Path coefficients have been adjusted for sampling stratification, clustering and weighting of the data. Exogenous variables are correlated although *curved arrows* are not shown. Adolescent age and BMI are included as covariates although not shown. Adolescent age and BMI are correlated with all exogenous variables although *curved arrows* are not shown

Fig. 3.

Heterosexual romantic involvement X Menarche contributions to depressive symptoms.

Note Menarche is recoded to capture girls who have yet to reach menarche (0 = no menarche to 11 = age 7 years); Data have been weighted to be nationally representative

Table 1

Social and demographic information of study sample by romantic involvement

	M (SE)		Statistics (F)
	In a relationship (n = 250)	Not in a relationship (n = 356)	
Age at time of interview (years)	15.35 (0.09)	14.68 (0.08)	33.93*
Maternal education	12.33 (0.14)	12.49 (0.14)	0.65
Family income	36,373 (2,918.21)	39,369 (1,862.14)	0.82
Body mass index	24.11 (0.34)	23.82 (0.33)	0.55

Data have been weighted to be nationally representative. Standard errors have been adjusted for sampling stratification, clustering and weighting of the data

*
 $p < 0.05$

Table 2

Bivariate correlations for key study variables for the total sample

	1	2	3	4	5
1. Depressive symptoms	–	0.11 ⁺	–0.35**	–0.22**	–0.20**
2. Menarche	–0.04	–	–0.08	–0.06	0.007
3. Maternal support	–0.20**	0.05	–	0.26**	0.27**
4. Paternal support	–0.015*	0.05	0.35**	–	–.001
5. Peer support	–0.10*	0.05	–0.05	0.08	–

Coefficients above the diagonal are for adolescent girls in a relationship and those below the diagonal are for adolescent girls not in a relationship

⁺ $p < .10$;

* $p < .05$;

** $p < .01$

Table 3

Means and standard errors of key study variables by romantic involvement

	M (SE)		Statistics (F)
	In relationship (n = 250)	Not in relationship (n = 357)	
Depressive symptoms	9.32 (0.33)	8.87 (0.31)	0.36
Menarche	11.90 (0.09)	12.08 (0.07)	2.58
Maternal support	4.21 (0.05)	4.22 (0.04)	0.02
Paternal support	3.46 (0.08)	3.57 (0.06)	1.40
Peer support	3.52 (0.56)	3.32 (0.04)	16.07*

Data have been weighted to be nationally representative. Standard errors have been adjusted for sampling stratification, clustering and weighting of the data

* $p < 0.05$