Romantic and sexual activities, parent–adolescent stress, and depressive symptoms among early adolescent girls

Joanne Davila*, Catherine B. Stroud, Lisa R. Starr, Melissa Ramsay Miller, Athena Yoneda, Rachel Hershenberg

SUNY Stony Brook, Stony Brook, NY, USA

Abstract

Building on evidence that romantic experiences are associated with depressive symptoms in adolescence, we examined their bidirectional association, as well as the role of sexual activity and parent–adolescent stress in their association. Data were collected from 71 early adolescent girls (M age 13.45 years; SD = 0.68) and their primary caregiver initially and one year later. Results indicated that adolescents who engaged in more romantic activities experienced increases in depressive symptoms over time. Second, greater depressive symptoms predicted romantic involvement and sexual activities, including intercourse, one year later. Third, dysphoric adolescents who were experiencing higher parent–adolescent stress were the most likely to engage in subsequent sexual intercourse. Implications for understanding how the association between depressive symptoms and romantic and sexual experiences develops and the course of this association are discussed.
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Accumulating data indicate that adolescents who report being involved in romantic activities (e.g., dating, flirting, feelings of attraction) or in romantic relationships are more likely to

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* Corresponding author. Department of Psychology, SUNY Stony Brook, Stony Brook, NY 11794-2500, USA. Tel.: +1 631 632 7826.

E-mail address: joanne.davila@stonybrook.edu (J. Davila).

experience symptoms of depression (for a review see Davila, 2008). Despite the consistency of the association between adolescent romantic experiences and depressive symptoms, little is known about why they are associated or about the nature of their temporal relations (i.e., the extent to which romantic experiences predict depressive symptoms over time and vice versa). This is an important gap in the literature because rates of depression are high among adolescents (e.g., Essau, Conradt, & Petermann, 2000; Lewinsohn, Rohde, Seeley, Klein, & Gotlib, 2000), and even prior subclinical depressive symptoms in adolescence predict future episodes in adulthood (e.g., Pine et al., 1999). Thus, learning more about how and why adolescent romantic experiences may confer risk for depressive symptoms is an important endeavor. Similarly, learning more about how adolescent depressive symptoms may impair romantic functioning is important. Adolescent romantic experiences are a normative and salient aspect of adolescence. They provide opportunities for necessary socialization (e.g., learning relationship skills, providing chances to develop and practice self- and emotion-regulation skills) as well as potentially stressful challenges with which adolescents must cope. If depressive symptoms are impairing these processes, adolescents may fail to develop skills that will allow for adaptive relationship functioning in the future.

The present study was designed to shed light on why romantic experiences and depressive symptoms are related and to examine their bidirectional relations. The study was guided by two related theoretical models. One was a stress and coping model of adolescent romantic experiences and depressive symptoms (Davila, 2008), which provides a framework for understanding why adolescent romantic experiences might increase risk for depressive symptoms. Specifically, romantic experiences are associated with a great deal of intense emotion (Larson, Clore, & Wood, 1999), often involve breakups and issues of rejection, involve needs for intimacy and support, require skills to deal with conflict, and require the negotiation of sexual feelings and desires. As such, romantic experiences may be challenging for adolescents, thereby increasing risk for depressive symptoms. This is consistent with the few existing longitudinal studies, which have shown increases in depressive symptoms over time among adolescents who were or became involved in a romantic relationship (e.g., Davila, Steinberg, Kachadourian, Cobb, & Fincham, 2004; Joyner & Udry, 2000). We sought to replicate and extend these findings by further examining whether romantic experiences (both relationship involvement and activities, the latter of which has not been examined longitudinally) are depressogenic.

In addition, we examined the role of sexual activity in the association between romantic experiences and depressive symptoms. Although not exclusively the case, adolescent sexual activity typically occurs in the context of romantic experiences or relationships (Furman & Shaffer, 2003). And although sexual activity is a normative adolescent behavior and may have adaptive qualities, early sexual activity, particularly intercourse and casual sex, is frequently associated with poorer psychosocial functioning, including depression (Bingham & Crockett, 1996; Grello, Welsh, Harper, & Dickson, 2003; Shulman, Weisman, & Schelyer, 2008; Welsh, Grello, & Harper, 2003). In line with the stress and coping model, sexual activity may, therefore, be challenging for adolescents to negotiate, increasing the likelihood that it will be associated with depressive symptoms. As such, to the extent that adolescents who engage in more romantic activities also engage in more sexual activities, it may be the latter that are particularly depressogenic.

The stress and coping model also suggests that the risk for depressive symptoms may be further increased to the extent that adolescents do not possess necessary coping and support resources to

negotiate the challenges that romantic experiences bring. In line with this, there is evidence that poor family functioning strengthens the association between romantic experiences and depressive symptoms in adolescence. For example, Steinberg and Davila (2008) found, in cross-sectional analyses of the present sample, that the association between romantic experiences and depressive symptoms was stronger for early adolescents girls with emotionally unavailable parents, suggesting that when parents are unavailable to help youth regulate emotions and cope with the stress of romantic experiences, young people may fail to develop such skills and be more vulnerable to depressive symptoms (for another example see Doyle, Brendgen, Markiewicz, & Kamkar, 2003). Therefore, romantic and sexual activities may predict increases in depressive symptoms most for adolescents with stressful relationships with parents.

The other model that guided our research also involves coping as a mechanism, but in this case to explain how depressive symptoms might increase the likelihood of romantic involvement and engaging in romantic (or sexual) activities. Depressive symptoms include or often manifest in feelings of low self-worth, feelings of social isolation, low perceived support from others, dependence on others, low positive affect, and high negative affect, and there is ample evidence that these experiences can affect interpersonal behavior, experiences, and choices (e.g., Coyne, 1976; Daley & Hammen, 2002; Hammen, 1991; Joiner, Alfano, & Metalsky, 1992). Therefore, it is possible that adolescents who feel depressed may seek romantic (or sexual) experiences as a coping mechanism in an attempt to acquire support, meet dependency needs, regulate affect, and/or get reassurance about their self-worth. Indeed, Gotlib, Lewinsohn, and Seeley (1998) found that depression during adolescence was associated with earlier marriage and suggested that this may reflect an attempt to solve interpersonal problems and/or deal with dependency issues. However, there is little research on whether depression predicts relationship entry in adolescence (for an exception see Davila et al., 2004), and none examining early adolescence when youth are early in their dating histories. If depressive symptoms contribute to relationship involvement early on, it may be a warning sign for future relationship dysfunction (e.g., Gotlib et al., 1998). Similarly, Grello et al. (2003) found that adolescents' higher levels of depressive symptoms were associated with subsequent involvement in casual sex over a one-year period. Again, to the extent that this is occurring in early adolescence, it could signal significant risk.

A poor parent–adolescent relationship also might be involved in dysphoric adolescents seeking romantic and sexual experiences as a way to compensate for troubled family relationships. Adolescents, particularly females, with low parental support experience greater dysphoria, which is associated with engaging in sexually intimate relationships (Whitbeck, Hoyt, Miller, & Kao, 1992). Similarly, insecure attachment, which is associated with depression (for a review see Davila, Ramsay, Stroud, & Steinberg, 2005), is related to engaging in more romantic activities in adolescence, particularly approach-oriented ones (like asking someone out on a date) and risky ones (such as dating someone involved in another relationship; Steinberg, Davila, & Fincham, 2006). Therefore, dysphoric adolescents who have stressful or unsupportive relationships with parents may seek and turn to romantic or sexual partners for support and/or as a way of counteracting negative family experiences. As such, we examined whether depressive symptoms would predict future engagement in romantic and sexual activities most among adolescents with more stressful relationships with parents.

Drawing on the two conceptual models, we made the following predictions. First, there would be bidirectional associations between romantic and sexual experiences and depressive symptoms.

Specifically, romantic and sexual experiences would predict increases in depressive symptoms over time, and depressive symptoms would predict increases in romantic and sexual experiences over time. Second, these associations would be strongest among adolescents with higher levels of parent–adolescent stress. We also examined whether sexual experiences would help explain the relation between romantic experiences and subsequent depressive symptoms. Because pubertal status may be associated with initiation of romantic and sexual activities, it was controlled in all analyses.

The predictions were tested in a 1-year longitudinal study of early adolescent girls and their primary caregiver. Compared to boys and younger girls, adolescent girls are more vulnerable to depression (Kessler, Avenevoli, & Ries Merikangas, 2001; Lewinsohn, Hops, Roberts, & Seeley, 1993; Nolen-Hoeksema & Girgus, 1994; Twenge & Nolen-Hoeksema, 2002). Compared to boys, girls also are more attuned to and affected by relationships (Compton, Nelson, & March, 2000; Nolen-Hoeksema & Girgus, 1994; Rose & Rudolph, 2006). As such, the proposed associations may be most evident among early adolescent girls, although this remains to be tested directly.

Method

Participants

Participants were 71 early adolescent girls who participated with their primary caregiver in the first two waves of a larger project on relationships and psychological functioning. The initial sample (i.e., those who participated in the first wave) contained 83 girls and caregivers (mothers = 80; fathers = 3). Eighty-eight percent (*n* = 71) of the sample participated again one year later. The data from girls participating in both waves were included in the present analyses. The Stony Brook University Committee on Research Involving Human Subjects approved the research. Families were recruited from participants in a larger questionnaire study. Questionnaire study participants were from three school districts in Suffolk County, New York, representing a range of demographics. Parents of all students in the 7th and 8th grades were sent letters describing the study, along with consent and assent forms and questionnaires. Approximately 7% of families provided consent/assent and usable questionnaire data. Parents of all female questionnaire study participants (*n* = 173) were contacted about the current study, and 64 participated. To recruit additional participants, an informational flyer was included with a monthly newsletter in one district, resulting in 19 additional families. Girls' average age was 13.45 (SD = 0.68; range = 12–15) and 45% were in 8th grade. Of those reporting ethnicity, 89% reported Caucasian, but this varied by school district (100% in one, 95% in another, 61% in the third) in a manner that matched district ethnicity data (2006 reports indicated 96, 91, and 64% respectively). Parent-reported median family income ranged from $53,000 to $127,000, consistent with median household incomes in the districts (Public School Review, n.d.). Thus, our sample is representative of ethnicity and income for the three school districts. Although the income data may suggest moderate to high SES, this should be taken in the context of a wide range of parental education, with many parents (42%) reporting only a high school education.

Procedure

Each girl and her parent attended two 3-h lab sessions (T1) at the State University of New York at Stony Brook. During the first, girls and parents provided consent, assent and demographics, parents were interviewed privately about stress in the parent–adolescent relationship, and girls were interviewed privately about depressive symptoms. In the second, girls privately completed questionnaires on romantic and sexual activities and pubertal status. Girls and parents each received $35 for the first session and $40 for the second. One year later (T2), girls provided questionnaire data on romantic and sexual activities via mail and/or through a secure website, and girls were interviewed privately over the telephone about depressive symptoms (see Rohde, Lewinsohn, & Seeley, 1997 for evidence of the comparability of in-person and telephone diagnostic interviewing). Girls and parents were each paid $75 for T2. Girls who did not participate at T2 did not differ from girls who did on any T1 variables, except depressive symptoms and non-intercourse sexual activities. Girls who did not participate at T2 showed somewhat more depressive symptoms ($p = 0.05$) and more sexual activities ($p < 0.01$). Thus longitudinal results may underestimate actual effects.

Measures

Depressive symptoms

Depressive symptoms were assessed using the Schedule for Affective Disorders and Schizophrenia for School Age Children–Present and Lifetime Version (K-SADS-PL; Kaufman, Birmaher, Brent, & Rao, 1997), a widely used semi-structured interview. At T1, current symptoms were assessed. At T2 both current symptoms and worst symptoms in the past year (since T1) were assessed. To maximize the prediction of clinically significant symptoms, worst symptoms in the past year were used as the T2 outcome variable. To capture both diagnosable and sub-threshold symptoms, interviewers rated participants on a 4-point scale (0 = participant shows no symptoms of depression, 1 = participant shows mild symptoms of depression, 2 = participants shows moderate, sub-threshold symptoms of depression, 3 = participant meets DSM-IV criteria for depression). As such, each participant gets one rating that reflects how symptomatic she is. Previous research has found good reliability and validity for the K-SADS-PL (Kaufman et al., 1997). For T1, 16 (19%) of the interviews were coded by a second coder. Interrater reliability analyses yielded an intraclass correlation of 0.82 (alpha = 0.90) for current depressive symptoms. For T2, 21 (28%) of interviews were rated by a second coder. Interrater reliability analyses yielded an intraclass correlation of 0.83 (alpha = 0.91) for worst depressive symptoms. At T1, 61 girls had no symptoms, 9 had mild symptoms, 10 had moderate symptoms, and 2 had diagnosable symptoms. For worst symptoms at T2, 43 girls had no symptoms, 9 had mild symptoms, 15 had moderate symptoms, and 7 had diagnosable symptoms. These rates suggest a reasonable level of depressive symptoms to be meaningful in analyses.

Romantic and sexual activities

A self-report measure designed for a previous study (Steinberg et al., 2006) was administered at T1 and T2. Two items were used to assess sexual activity. Adolescents rated the frequency (1 = never, 2 = once or twice, 3 = a few times, 4 = many times) with which they engaged in (1)

sexual intercourse with a date or romantic partner and (2) other sexual relations with a date or romantic partner (more than kissing, but not intercourse). Frequency ratings for each item were used in analyses. At T1, 3 participants reported engaging in sexual intercourse at least once (i.e., reported a 2, 3, or 4 on the frequency scale). At T2, 4 reported doing so. At T1, 11 reported engaging in other sexual relations at least once (i.e., reported a 2, 3, or 4 on the frequency scale). At T2, 16 reported doing so. The rates, though low, are not surprising for this age group, but suggest caution in generalizing from this sample.

To assess romantic activities, adolescents rated the frequency (using the same scale as above) with which they engaged in the following: having been asked out on a date, having asked someone out on a date, having gone on a good date, having flirted with someone, having been romantically attracted to someone, and having kissed a date or romantic partner. Responses were summed for an overall measure of normative activity (alpha = 0.81). For both romantic and sexual activities, at T1, items were rated for whether they ever occurred. At T2, items were rated for the past year (since T1) to capture new experiences not overlapping with T1 or prior (alpha = 0.85).

Romantic relationship status

At T1, adolescents were asked whether they were currently in a romantic relationship and whether they had ever been in one. Twelve reported a current relationship (average length in weeks = 4.5 (SD = 4.6), range = 1–12), and an additional 44 reported a previous relationship (average length in weeks = 17.4 (SD = 23.4) range = 1–144). Because of the small number in each group, we combined them for a variable indicating those who were currently or had previously been in a romantic relationship (scored as 1) versus no prior or current relationship history (scored as 0). At T2, girls reported current romantic relationship status (19 in a relationship, scored as 1; 52 not, scored as 0). Data on relationship length at T2 were not collected.

Stress in the parent–adolescent relationship

At T1, stress was assessed with an interview administered to the parent based on Hammen et al.'s (1987; Rudolph, Hammen, & Burge, 2000) chronic stress interview. Focusing on the past 6 months, interviewers probed the level of trust, communication, closeness, and conflict (amount and resolution) within the parent–adolescent relationship. Based on all of the information provided, interviewers made a rating of the overall stressfulness of the circumstances on a 5-point scale ranging from (1) no stress to (5) severe stress (half-point ratings were allowed). As such, each participant got one rating that reflects how much stress there is in the parent–adolescent relationship. Twenty percent (16) of the interviews were coded reliably by a second coder (intraclass correlation = 0.74; alpha = 0.88).

Pubertal status

Pubertal status was assessed at T1 using the Pubertal Development Scale (PDS; Petersen, Crockett, Richards, & Boxer, 1988). The PDS is a 5-item self-report inventory that assesses growth spurt in height, skin changes, body hair changes, breast development, and age at menarche. Each item is rated on a 4-point scale (1) no development; (2) development has barely started; (3) development is definitely underway; (4) development seems completed) except for menarche which is rated dichotomously – (1) has not begun, (4) has begun, and the mean of the

items is computed. The PDS has demonstrated good reliability (Petersen et al., 1988) and validity (Brooks-Gunn, Warren, Rosso, & Gargiulo, 1987).

Results

Table 1 presents correlations between the continuous variables and their means, SDs, and ranges for all participants providing data. Greater T1 and T2 depressive symptoms were significantly associated with higher frequencies of nearly all romantic and sexual variables at T1 and T2. Greater parent–adolescent stress was significantly associated with higher frequencies of T2 sexual activities. More advanced pubertal status was associated with engaging in more romantic activities at T1 and T2. In the following regression analyses, sample sizes are based on participants who provided complete data for the variables in each analysis.

Predicting depressive symptoms

Three hierarchical regression analyses were conducted. Each analysis predicted T2 worst depressive symptoms from one of the romantic experience variables (T1 romantic relationship status, T1 romantic activities) and the two T1 sexual activity variables. On the first step of each analysis, T1 depressive symptoms and pubertal status were entered as controls. On the second step, one romantic experience variable was entered. On the third step, the two sexual activity variables were entered. On the fourth step, parent–adolescent stress was entered, and on the final step, the two-way interactions between parent–adolescent stress and each of the three romantic and sexual variables were entered. Variables were centered prior to computing interaction terms. Results are shown in Table 2.

Table 1
Correlations between the continuous variables, means and standard deviations.

	1	2	3	4	5	6	7	8	9	10
1. T1 depressive symptoms										
2. T2 depressive symptoms	0.53*									
3. T1 romantic activities	0.24*	0.39*								
4. T2 romantic activities	0.20	0.29*	0.81*							
5. T1 non-intercourse sexual activities	0.34*	0.27*	0.36*	0.18						
6. T2 non-intercourse sexual activities	0.39*	0.51*	0.45*	0.41*	0.37*					
7. T1 sexual intercourse	0.19	0.21	0.28*	0.14	0.70*	0.21				
8. T2 sexual intercourse	0.61*	0.35*	0.30*	0.22	0.58*	0.54*	0.62*			
9. T1 parent–adolescent stress	0.06	−0.01	0.22	−0.04	0.21	0.30*	0.02	0.28*		
10. Pubertal status	0.04	0.16	0.44*	0.33*	0.06	0.22	0.03	0.02	0.21	
M	0.34	0.77	14.12	14.87	1.07	1.31	1.03	1.09	2.68	2.53
SD	0.70	1.07	4.43	4.69	0.26	0.67	0.17	0.44	0.85	0.46
Range	0–3	0–3	6–22	6–24	1–2	1–4	1–2	1–4	1–4.5	1.2–3.4

Notes. T1 = Time 1 (initial data collection); T2 = Time 2 (1 year follow-up). *N* ranges from 67 to 71.
* $p <$ or $= 0.05$.

Table 2
Hierarchical regression analyses predicting T2 depressive symptoms from T1 variables.

	Model 1			Model 2		
	b	B	t	b	B	t
1. T1 depressive symptoms	0.76	0.45	4.10*	0.76	0.45	4.10*
Pubertal status	0.17	0.07	0.66	0.17	0.07	0.66
	R^2 change = 0.19, $p < 0.05$			R^2 change = 0.19, $p < 0.05$		
2. Romantic variable	0.33	0.14	1.27	0.07	0.27	2.29*
	R^2 change = 0.02, $p = 0.21$			R^2 change = 0.06, $p < 0.05$		
3. Non-intercourse sexual activity	0.26	0.04	0.32	0.21	0.06	0.46
Sexual intercourse	0.39	0.10	0.77	0.15	0.02	0.19
	R^2 change = 0.02,, $p = 0.52$			R^2 change = 0.00, $p = 0.83$		
4. Parent−adolescent stress	−0.18	−0.14	−1.19	−0.17	−0.13	−1.14
	R^2 change = 0.02, $p = 0.24$			R^2 change = 0.02, $p = 0.26$		
5. Romantic variable × stress	0.26	0.08	0.63	−0.03	−0.10	−0.86
Non-intercourse × stress	−2.03	−0.10	−0.71	−0.65	−0.13	−1.17
Sexual intercourse × stress	−0.73	−0.15	−1.28	−1.70	−0.09	−0.62
	R^2 change = 0.03, $p = 0.45$			R^2 change = 0.04, $p = 0.37$		
	Overall $R^2 = 0.19$			Overall $R^2 = 0.23$		

Notes. T1 = Time 1 (initial data collection); T2 = Time 2 (1 year follow-up); Model 1 includes T1 romantic relationship status as the predictor; Model 2 includes T1 romantic activities as the predictor; Romantic variable = T1 romantic relationship status variable or T1 romantic activities variable. Results for new variables added to the analysis are shown for each step. Adjusted R^2s are presented.
* $p <$ or $= 0.05$.

In the analysis predicting T2 depressive symptoms from T1 romantic relationship status (Model 1), none of the variables except T1 depressive symptoms were significant predictors. However, in the analysis including T1 romantic activities (Model 2), engaging in more activities was associated with increases in depressive symptoms over time, and this remained true even when the sexual and stress variables were included in the model.

Predicting romantic and sexual experiences

Four hierarchical regression analyses were conducted. Each analysis predicted one of the T2 romantic or sexual activity outcomes (romantic relationship status, romantic activities, non-intercourse sexual activity, sexual intercourse). On the first step of each analysis, as controls, the corresponding T1 romantic or sexual activity variable was entered, as was pubertal status. On the second step, T1 depressive symptoms were entered. On the next step, in the analyses for the sexual activity outcomes only, T2 romantic relationship status was entered. This was followed in the next step by parent−adolescent stress, and on the final step, the two-way interaction between parent−adolescent stress and depressive symptoms. Note that for the analysis predicting T2 romantic relationship status, a logistical hierarchical regression analysis was conducted because of the

dichotomous nature of the variable. These results are presented in Table 3. All other results from the linear regressions are shown in Table 4.

As shown in Table 3, T1 depressive symptoms were the only significant predictor of T2 romantic relationship status. Greater depressive symptoms were associated with being in a romantic relationship at T2. However, as shown in Table 4, depressive symptoms did not predict romantic activities, although parent−adolescent stress did − greater stress was associated with engaging in fewer romantic activities. Depressive symptoms did predict sexual activities at T2, as Table 4 shows. Greater depressive symptoms remained the only significant predictor of increases in non-intercourse sexual activity even when T2 romantic relationship status, parent−adolescent stress, and the interaction between stress and depressive symptoms were included in the analysis. Similarly, greater depressive symptoms predicted increases in sexual intercourse over time, although this main effect was qualified by a significant interaction between parent−adolescent stress and depressive symptoms. The interaction was decomposed following Aiken and West (1991) procedures. As depicted in Fig. 1, at high levels of parent−adolescent stress (one SD above the mean), greater T1 depressive symptoms were significantly associated with engaging in sexual intercourse ($b = 0.24$, $B = 0.52$, $p < 0.001$), whereas at low levels of parent−adolescent stress (one SD below the mean), the association was not significant ($b = 0.06$, $B = 0.13$, $p = 0.31$).

Discussion

This study examined the bidirectional associations between depressive symptoms and romantic and sexual activities among early adolescent girls, and the role of parent−adolescent stress in the associations. Three key sets of findings emerged. First, adolescents who engaged in more romantic activities experienced increases in depressive symptoms over time. Importantly, these activities were relatively normative, including dating, flirting, feeling attracted to someone, and kissing. Consistent with the stress and coping model guiding the study (Davila, 2008), this indicates that

Table 3
Hierarchical logistic regression analysis predicting romantic relationship status at T2 from T1 variables.

	b	Wald[a]
1. T1 Romantic relationship status	−0.97	1.93
Pubertal status	−0.94	2.05
Block $X^2(2) = 3.29$, $p = 0.19$		
2. T1 depressive symptoms	0.97	5.90*
Block $X^2(1) = 6.53$, $p < 0.05$		
3. Parent−adolescent stress	−0.66	2.94
Block $X^2(1) = 3.21$, $p = 0.07$		
4. Depressive symptoms × stress	−0.19	0.27
Block $X^2(1) = 0.27$, $p = 0.60$		

Notes. Final model $X^2(5) = 13.30$, $p < 0.05$. T1 = Time 1 (initial data collection); T2 = Time 2 (1 year follow-up); Results for new variables added to the analysis are shown for each step.
* $p <$ or $= 0.05$.
[a] df = 1.

Table 4
Hierarchical regression analyses predicting T2 romantic and sexual activities from T1 variables.

| | T2 romantic or sexual outcome variable | | | | | | | | |
| | Romantic activities | | | Non-intercourse sexual activity | | | Sexual intercourse | | |
	b	B	t	b	B	t	b	B	t
1. T1 romantic or sexual variable	0.88	0.82	10.03*	0.88	0.37	3.26*	0.97	0.57	5.46*
Pubertal status	−0.53	−0.05	−0.62	0.29	0.19	1.67	−0.06	−0.10	−0.93
	R^2 change $= 0.65$, $p < 0.05$			R^2 change $= 0.18$, $p < 0.05$			R^2 change $= 0.33$, $p < 0.05$		
2. T1 depressive symptoms	−0.05	−0.01	−0.09	0.28	0.29	2.56*	0.14	0.29	2.90*
	R^2 change $= 0.00$, $p = 0.93$			R^2 change $= 0.08$, $p < 0.05$			R^2 change $= 0.08$, $p < 0.05$		
3. T2 romantic relationship status[a]	−	−	−	−0.20	−0.13	−1.09	−0.11	−0.16	−1.47
				R^2 change $= 0.01$, $p = 0.28$			R^2 change $= 0.02$, $p = 0.15$		
4. Parent–adolescent stress	−1.10	−0.19	−2.60*	0.17	0.20	1.78	0.03	0.07	0.69
	R^2 change $= 0.04$, $p < 0.05$			R^2 change $= 0.04$, $p = 0.08$			R^2 change $= 0.01$, $p = 0.49$		
5. Depressive symptoms × stress	−0.17	−0.03	−0.41	0.05	0.07	0.54	0.10	0.24	2.37*
	R^2 change $= 0.00$, $p = 0.68$			R^2 change $= 0.00$, $p = 0.59$			R^2 change $= 0.05$, $p = 0.02$		
	Overall $R^2 = 0.66$			Overall $R^2 = 0.24$			Overall $R^2 = 0.43$		

Notes. T1 = Time 1 (initial data collection); T2 = Time 2 (1 year follow-up); Romantic or sexual variable = romantic activities variable or non-intercourse sexual activity variable or sexual intercourse variable. Results for new variables added to the analysis are shown for each step. Adjusted R^2s are presented.
* $p <$ or $= 0.05$.
[a] = This variable was included only in the analyses for T2 non-intercourse sexual activity and T2 sexual intercourse.
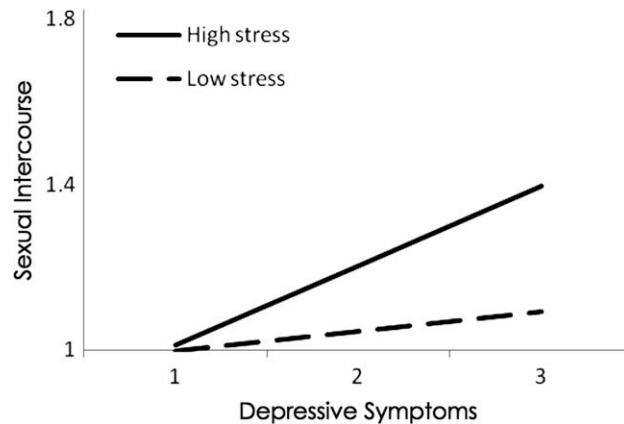
Fig. 1. Interaction between parent–adolescent stress and depressive symptoms predicting reports of sexual intercourse one year later.

even typical romantic experiences may be challenging for early adolescents, which suggests they may need support and assistance with negotiating them in an adaptive fashion.

However, in contrast to prior research (Davila et al., 2004; Joyner & Udry, 2000), being involved in a romantic relationship did not predict increases in depressive symptoms. Perhaps this may be due to differing operational definitions of the variables across studies or to different age groups. For example, Davila et al. (2004) found longitudinal associations among late adolescents, and compared those who were dating or in a serious relationship to those who were not involved in any dating or relationship activity at all. Perhaps the effect is more pronounced for older adolescents in more serious relationships, or perhaps it is dating that drives the effect, which may be better represented in the current study's measure of romantic activities. In line with this, in Joyner and Udry (2000) study, romantic involvement was defined as "a special romantic relationship with someone" or as having held hands with someone, kissed someone, or told someone they liked or loved them (as long as the person was not a family member). This definition also resembles our romantic activities variable. Another possibility is that younger adolescents, like those in our study, may have trouble differentiating romantic and platonic friendships (Shulman & Scharf, 2000), the latter of which should not be related to depressive symptoms. If our participants lacked a clear definition of romantic involvement, but were able to understand more objective questions (such as the romantic activities questions), this may account for the findings. Nonetheless, despite the fact that the literature has not been fully consistent on which specific romantic variables predict depression, and that further refinement of theory and methods are necessary to clarify this, it is clear that the present results add to the growing body of literature showing that adolescent romantic experiences, in general, are associated with increases in depressive symptoms.

Of course it could be argued that a dysphoric response to challenging romantic activities in early adolescence is normative. Indeed, there are romantic experiences (e.g., breakups) where it would be unusual if at least a mild dysphoric response did not occur. This raises the question of what differentiates between depressive symptoms as a normative response that might promote learning and growth, and depressive symptoms as a maladaptive response that might confer risk

for future depression. Clarifying these pathways, and what we can do to help adolescents so that normative dysphoria does not become significant depression, will be high priorities for research.

It also is important to note that engagement in sexual activities and intercourse did not predict increases in depressive symptoms. This is not entirely inconsistent with the literature. Although studies show consistent cross-sectional associations between sexual activity and depressive symptoms, the longitudinal relation is less clear (e.g., Bingham & Crockett, 1996; Grello et al., 2003; Shulman et al., 2008; Waller et al., 2006), and scholars now suggest that early sexual activity, particularly casual sex, may be a marker of psychological and behavioral problems, rather than a cause (Grello et al., 2003).

A second important set of findings emerged with regard to the consequences of depressive symptoms for early adolescent girls. Greater depressive symptoms predicted romantic involvement and sexual activities, including intercourse, one year later, even when controlling for initial levels of involvement and activity and pubertal status. This is consistent with the idea that dysphoric adolescents may be seeking romantic and sexual experiences. Although our data cannot speak to why, it may be the case, as noted earlier, that adolescents do so in an attempt to acquire support or regulate affect. The data also may be consistent with the notion that there may be a cluster of problem behaviors that go together in early adolescence, including early sexual intercourse, depression, and delinquent behaviors which serve as markers for future psychological and behavioral problems (e.g., Grello et al., 2003; Jessor, Costa, Jessor, & Donovan, 1983; Williams, Connolly, & Cribbie, 2008). As such, dysphoric adolescents who are engaging in increased romantic and sexual involvement may be the same adolescents who are involved in other problem activities. These speculations will need to be examined in the future.

A third set of findings demonstrates that the family context plays a role in the association between depressive symptoms and engaging in sexual intercourse. Dysphoric adolescents who were experiencing higher chronic parent–adolescent stress were the most likely to engage in sexual intercourse subsequently. This is consistent with recent research showing that dysphoric adolescent girls who reported a close relationship with their mother were less likely to engage in subsequent sexual intercourse (Rink, Tricker, & Harvey, 2007). Interestingly, in that same study, a close relationship with the father predicted greater likelihood of intercourse, suggesting that research should continue to examine the unique effects of relationships with mothers and fathers.

Taken together, the findings are consistent with interpersonal models of depression, particularly the stress generation model. This model posits that depressed individuals engage in behaviors that function to generate interpersonal stress in their lives, which then maintains or exacerbates depression (Davila, Hammen, Burge, Paley, & Daley, 1995; Hammen, 1991). That dysphoric early adolescent girls are engaging in potentially risky behaviors (e.g., sexual activities), and that even relatively normative romantic activities increases depressive symptoms, suggests that these girls may be vulnerable to developing maladaptive patterns that may ensnare them in the vicious cycle of interpersonal stress and depression. The findings also are consistent with research on the role of the family in the development of interpersonal functioning. A growing body of research is beginning to show that family relationships in adolescence predict later romantic functioning (e.g., Conger, Cui, Bryant, & Elder, 2000; Stocker & Richmond, 2007). The present study adds to this literature in a novel way by showing that family factors interact with depressive symptoms in predicting interpersonal behavior.

Earlier we raised the issue that romantic and sexual experiences may be part of a set of problem behaviors that are related to depression. As such, research needs to further examine the specificity of depressive symptoms' association with romantic experiences, particularly with regard to other types of symptoms. However, it also is important to note that the findings do speak to the unique association that romantic experiences may have with depressive symptoms. It is notable that associations remained when sexual activities and family stress were included as covariates, and this speaks to the incremental validity of romantic experiences in predicting depressive symptoms. This suggests that romantic functioning could be a unique target to help youth develop better skills and prevent risk for depression.

Our confidence in the present findings is bolstered by the methodological strengths of the study, including the longitudinal design, the use of objectively and reliably coded interview data to assess key constructs, and the collection of stress data from parents rather than adolescents. These design features rule out potential concerns about method variance, and they allow for clear temporal ordering of the variables. There are, of course, limitations to the study, which must be acknowledged. First, replication will be important as the sample size, the very low response rates, the self-selected nature of the sample, the low rates of sexual activity, and the inclusion of only girls seriously restrict generalizability. Given that girls are at greater risk for depression in adolescence (Kessler et al., 2001; Lewinsohn et al., 1993; Nolen-Hoeksema & Girgus, 1994; Twenge & Nolen-Hoeksema, 2002), focusing on them is appropriate, but research needs to examine gender differences as well. Second, we only focused on one aspect of the family environment. Albeit an important aspect, there may be other family processes that play a role in the relation between romantic functioning and depressive symptoms. This is an important consideration given that, although parent–adolescent stress predicted sexual outcomes, it did not predict depressive symptoms in this study.

Similarly, although this study makes a contribution to understanding depressive symptoms' unique associations with romantic experiences, there is more to be done in this regard, particularly with the role of peers. Peers are an important context in which romantic experiences develop and play out (e.g., Connolly & Goldberg, 1999; Kuttler & La Greca, 2004; Shulman & Scharf, 2000). Peers also play an important role in adolescent depression (for a review see La Greca, Davila, & Siegel, 2008). As such, the most refined understanding of the association between romantic experiences and depressive symptoms will come from research that considers the peer context in which the association emerges and is maintained.

Research also will need to examine the role of partner and relationship characteristics (e.g., age, length of relationship) in associations between romantic experiences and depressive symptoms. For example, it may be that girls' involvement with older partners creates both difficulties with parents and in the relationship, which then increases risk for depressive symptoms. Unfortunately, such data were not collected in the present study. Finally, to more fully elaborate the types of romantic (and sexual) experiences that predict or are predicted by depressive symptoms in adolescence more nuanced measures of these experiences may be needed. For example, casual versus more serious or intimate experiences might show different associations, as might reciprocal versus non-reciprocal relationships (Carlson & Rose, 2007; Grello et al., 2003; Williams et al., 2008). Despite the study's limitations, the results clearly support and extend the growing database on the association between depressive symptoms and romantic experiences, and hopefully can provide the impetus for research that continues to develop and refine understanding of this important issue.

Acknowledgment

References

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage Publications.

Bingham, C. R., & Crockett, L. J. (1996). Longitudinal adjustment patterns of boys and girls experiencing early, middle, and late sexual intercourse. *Developmental Psychology, 32*, 647–658.

Brooks-Gunn, J., Warren, M. P., Rosso, J., & Gargiulo, J. (1987). Validity of a self-report measures of girls' pubertal status. *Child Development, 58*, 829–841.

Carlson, W., & Rose, A. J. (2007). The role of reciprocity in romantic relationships in middle childhood and early adolescence. *Merrill-Palmer Quarterly, 53*, 262–290.

Compton, S. N., Nelson, A. H., & March, J. S. (2000). Social phobia and separation anxiety symptoms in community and clinical samples of children and adolescents. *Journal of the American Academy of Child & Adolescent Psychiatry, 39*, 1040–1046.

Conger, R. D., Cui, M., Bryant, C. M., & Elder, G. H. (2000). Competence in early adult romantic relationships: a developmental perspective on family influences. *Journal of Personality and Social Psychology, 79*, 224–237.

Connolly, J. A., & Goldberg, A. (1999). Romantic relationships in adolescence: the role of friends and peers in their emergence and development. In W. Furman, B. B. Brown, & C. Feiring (Eds.), *The development of romantic relationships in adolescence* (pp. 266–290). NY: Cambridge University Press.

Coyne, J. C. (1976). Toward an interactional description of depression. *Psychiatry: Journal for the Study of Interpersonal Processes, 39*, 28–40.

Daley, S., & Hammen, C. (2002). Depressive symptoms and close relationships in late adolescence: perspectives from dysphoric young women, their best friends, and their romantic partners. *Journal of Consulting and Clinical Psychology, 70*, 129–141.

Davila, J. (2008). Depressive symptoms and adolescent romance: theory, research, and implications. *Child Development Perspectives, 2*, 26–31.

Davila, J., Hammen, C., Burge, D., Paley, B., & Daley, S. E. (1995). Poor interpersonal problem-solving as a mechanism of stress generation in depression among adolescent women. *Journal of Abnormal Psychology, 104*, 592–600.

Davila, J., Ramsay, M., Stroud, C. B., & Steinberg, S. J. (2005). Attachment. In B. Hankin, & J. Abela (Eds.), *Development of psychopathology: A vulnerability-stress perspective* (pp. 215–242). Thousand Oaks, CA: Sage.

Davila, J., Steinberg, S., Kachadourian, L., Cobb, R., & Fincham, F. (2004). Romantic involvement and depressive symptoms in early and late adolescence: the role of a preoccupied relational style. *Personal Relationships, 11*, 161–178.

Doyle, A. B., Brendgen, M., Markiewicz, D., & Kamkar, K. (2003). Family relationships as moderators of the association between romantic relationships and adjustment in early adolescence. *Journal of Early Adolescence, 23*, 316–340.

Essau, C. A., Conradt, J., & Petermann, F. (2000). Frequency, comorbidity, and psychosocial impairment of specific phobia in adolescents. *Journal of Clinical Child Psychology, 29*, 221–231.

Furman, W., & Shaffer, L. (2003). The role of romantic relationships in adolescent development. In P. Florsheim (Ed.), *Adolescent romantic relations and sexual behavior: Theory, research, and practical implications* (pp. 3–22). Mahwah, NJ: Lawrence Erlbaum.

Gotlib, I. H., Lewinsohn, P. M., & Seeley, J. R. (1998). Consequences of depression during adolescence: marital status and marital functioning in early adulthood. *Journal of Abnormal Psychology, 107*, 686–690.

Grello, C. M., Welsh, D. P., Harper, M. S., & Dickson, J. W. (2003). Dating and sexual relationship trajectories and adolescent functioning. *Adolescent & Family Health, 3*, 103–112.

Hammen, C. (1991). Generation of stress in the course of unipolar depression. *Journal of Abnormal Psychology, 100*, 555–561.

Hammen, C., Adrian, C., Gordon, D., Burge, D., Jaenicke, C., & Hiroto, D. (1987). Children of depressed mothers: maternal strain and symptom predictors of dysfunction. *Journal of Abnormal Psychology, 96*, 190–198.

Jessor, R., Costa, F., Jessor, S., & Donovan, J. E. (1983). Time of first intercourse: a prospective study. *Journal of Personality and Social Psychology, 44*, 608–626.

Joiner, T. E., Jr., Alfano, M. S., & Metalsky, G. I. (1992). When depression breeds contempt: reassurance seeking, self-esteem, and rejection of depressed college students by their roommates. *Journal of Abnormal Psychology, 101*, 165–173.

Joyner, K., & Udry, J. R. (2000). You don't bring me anything but down: adolescent romance and depression. *Journal of Health and Social Behavior, 41*, 369–391.

Kaufman, J., Birmaher, B., Brent, D., & Rao, U. (1997). Schedule for affective disorders and schizophrenia for school-age children-present and lifetime version (K-SADS-PL): initial reliability and validity data. *Journal of the American Academy of Child & Adolescent Psychiatry, 36*, 980–988.

Kessler, R. C., Avenevoli, S., & Ries Merikangas, K. (2001). Mood disorders in children and adolescents: an epidemiologic perspective. *Biological Psychiatry, 49*, 1002–1014.

Kuttler, A. F., & La Greca, A. M. (2004). Linkages among adolescent girls' romantic relationships, best friendships, and peer networks. *Journal of Adolescence, 27*, 395–414.

Larson, R. W., Clore, G. L., & Wood, G. A. (1999). The emotions of romantic relationships: Do they wreak havoc on adolescents? In W. Furman, B. Brown, & C. Feiring (Eds.), *The development of romantic relationships in adolescence* (pp. 19–49). NY: Cambridge Press.

La Greca, A., Davila, J., & Siegel, R. (2008). Peer relations, friendships, and romantic relationships: implications for the development and maintenance of depression in adolescents. In N. Allen, & L. Sheeber (Eds.), *Adolescent emotional development and the emergence of depressive disorders*.

Lewinsohn, P. M., Hops, H., Roberts, R. E., & Seeley, J. R. (1993). Adolescent psychopathology: I. prevalence and incidence of depression and other DSM-III–R disorders in high school students. *Journal of Abnormal Psychology, 102*, 133–144.

Lewinsohn, P. M., Rohde, P., Seeley, J. R., Klein, D. N., & Gotlib, I. H. (2000). Natural course of adolescent major depressive disorder in a community sample: predictors of recurrence in young adults. *American Journal of Psychiatry, 157*, 1584–1591.

Nolen-Hoeksema, S., & Girgus, J. S. (1994). The emergence of gender differences in depression during adolescence. *Psychological Bulletin, 115*, 424–443.

Petersen, A. C., Crockett, L., Richards, M., & Boxer, A. (1988). A self-report measure of pubertal status: reliability, validity, and initial norms. *Journal of Youth and Adolescence, 17*, 117–133.

Pine, D. S., Cohen, E., Cohen, P., & Brook, J. (1999). Adolescent depressive symptoms as predictors of adult depression: Moodiness or mood disorder? *American Journal of Psychiatry, 156*, 133–135.

Public School Review. (n.d.). http://www.publicschoolreview.com. Accessed 01.02.07.

Rink, E., Tricker, R., & Harvey, S. M. (2007). Onset of sexual intercourse among female adolescents: The influence of perceptions, depression, and ecological factors. *Journal of Adolescent Health, 41*, 398–406.

Rohde, P., Lewinsohn, P. M., & Seeley, J. R. (1997). Comparability of telephone and face-to-face interviews in assessing axis I and II disorders. *American Journal of Psychiatry, 154*, 1593–1598.

Rose, A. J., & Rudolph, K. D. (2006). A review of sex differences in peer relationship processes: Potential trade-offs for the emotional and behavioral development of girls and boys. *Psychological Bulletin, 132*, 98–131.

Rudolph, K. D., Hammen, C., & Burge, D. (2000). Toward an interpersonal life-stress model of depression: the developmental context of stress generation. *Development and Psychopathology, 12*, 215–234.

Shulman, S., & Scharf, M. (2000). Adolescent romantic behaviors and perceptions: age- and gender-related differences, and links with family and peer relationships. *Journal of Research on Adolescence, 10*, 99–118.

Shulman, S., Weisman, O., & Schelyer, M. (March, 2008). Romantic contexts, sexual behavior, and depressive symptoms among adolescents. Poster presented at the biannual meeting of the Society for Research on Adolescence. Chichago, IL.

Steinberg, S. J., & Davila, J. (2008). Adolescent romantic functioning and depression: The moderating role of parental emotional availability. *Journal of Clinical Child and Adolescent Psychology, 37*, 350–362.

Steinberg, S. J., Davila, J., & Fincham, F. D. (2006). Adolescent romantic expectations and experiences: associations with perceptions about parental conflict and adolescent attachment security. *Journal of Youth and Adolescence, 35*, 314–329.

Stocker, C. M., & Richmond, M. K. (2007). Longitudinal association between hostility in adolescents' family relationships and friendships and hostility in their romantic relationships. *Journal of Family Psychology, 21*, 490–497.

Twenge, J. M., & Nolen-Hoeksema, S. (2002). Age, gender, race, socioeconomic status, and birth cohort difference on the children's depression inventory: A meta-analysis. *Journal of Abnormal Psychology, 111*, 578–588.

Waller, M. W., Hallfors, D. D., Halpern, C. T., Iritani, B. J., Ford, C. A., & Guo, G. (2006). Gender differences in associations between depressive symptoms and patterns of substance use and risky sexual behavior among a nationally representative sample of US adolescents. *Archives of Women's Mental Health, 9*, 139–150.

Welsh, D. P., Grello, C. M., & Harper, M. S. (2003). When love hurts: Depression and adolescent romantic relationships. In P. Florsheim (Ed.), *Adolescent romantic relations and sexual behavior: Theory, research, and practical implications* (pp. 185–211). Mahwah, NJ: Lawrence Erlbaum Associates Publishers.

Whitbeck, L. B., Hoyt, D. R., Miller, M., & Kao, M.-Y. (1992). Parental support, depressed affect, and sexual experience among adolescents. *Youth and Society, 24*, 166–177.

Williams, T., Connolly, J., & Cribbie, R. (2008). Light and heavy heterosexual activities of young Canadian adolescents: normative patterns and differential predictors. *Journal of Research on Adolescence, 18*, 145–171.