HHS Public Access

Author manuscript

J Youth Adolesc. Author manuscript; available in PMC 2018 January 01.

Published in final edited form as:

J Youth Adolesc. 2017 January ; 46(1): 213–227. doi:10.1007/s10964-016-0607-y.

Cognitive Vulnerabilities to Depression for Adolescents in Single-Mother and Two-Parent Families

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Abstract

Although research consistently suggests that adolescents in single-mother families are at increased risk for depression, the mechanisms that explain this relationship are unclear. In a community sample of adolescents (N = 368; ages 12–16; 50% female; 50% White) and their mothers (42% single), adolescents completed measures of depressive symptoms, rumination, and depressogenic inferential style at baseline and two yearly follow-ups. Mothers reported on stressful events that occurred in the child's life from birth until baseline. Adolescents raised by single mothers, relative to partnered mothers, experienced more childhood stressors and higher rumination levels at one-year follow-up. Additionally, higher rumination mediated the relationship between single motherhood and greater youth depressive symptoms at the two-year follow-up. Clinical implications and developmental considerations are discussed.

Keywords

single mother; depression; adolescence; rumination; depressogenic inferential style

Introduction

Perhaps the most noteworthy change in family structure over the last several decades is the increased prevalence of single-parent families. The number of families headed by one parent in the United States has more than tripled since the beginning of the Vietnam War, increasing from 9% of the population in 1960 to 32% of the population in 2012 (Vespa, Lewis, & Kreider, 2013). Moreover, the antecedents of single parenthood have changed, such that divorce has replaced the death of a spouse as the most common precipitant of single parenthood (Hilton & Devall, 1998). The increased prevalence of single parenthood has generated research across the fields of psychology and sociology on the systemic functioning of single-parent families, with the majority of research focused on single motherhood, given that approximately 83% of single parents are mothers (Vespa et al., 2013). Although the prevalence of single motherhood has risen tremendously, the majority

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of children in the United States are raised by partnered mothers; thus, there is an emphasis in the literature on comparing outcomes (such as youth development) across single-mother and two-parent families.

Although many children raised by single mothers are well-adjusted (Shook, Jones, Forehand, Dorsey, & Brody, 2010), research has indicated that single-mother families are more likely than two-parent families to experience low socioeconomic status (SES) or poverty, neighborhood stress, low emotional support, and increased role responsibilities (Hilton & Devall, 1998; Kendig & Bianchi, 2008). Moreover, children raised by single mothers are more likely than children raised by intact, two-parent families to experience a range of adjustment difficulties, including academic problems, substance abuse, social deficits, and psychopathology (Amato & Keith, 1991; Schleider, Chorpita, & Weisz, 2014). Although the risk for youth psychopathology conferred by single motherhood has been found to be greater for externalizing than internalizing symptoms in prior studies (Daryanani, Hamilton, Abramson, & Alloy, 2016; Hilton & Devall, 1998), research consistently has indicated that children raised in single-mother families are at elevated risk for depressive symptoms and disorders (Amato & Keith, 1991; Daryanani et al., 2016; Hilton & Devall, 1998). This risk is likely exacerbated during adolescence, a period of development characterized by markedly heightened risk for depressive symptoms and first onset of a depressive episode (Hankin, 2006). This compounded risk renders it important to investigate how single motherhood confers risk for adolescent depression, as uncovering mechanisms that help explain the relationship can better inform clinical interventions. However, there is a dearth of research on the potential mechanisms through which single motherhood confers risk for youth depression.

Consideration of the stressors and disadvantages inherent to growing up in a single-mother family is crucial when examining risk factors for offspring depression. An inherent disadvantage of single-mother families is that the mother takes on much of the responsibility typically shared by two parents, although this may be less impactful for single mothers who live with their own parents (Attar-Schwartz et al., 2009). Increased role responsibility, in addition to factors such as greater rates of psychopathology and economic burden (Hilton & Devall, 1998), likely compound to increase stress experienced by single mothers. At the systemic level, single-mother families are more likely to experience a myriad of stressors relative to intact, two-parent families, including interpersonal (e.g., familial conflicts), neighborhood (e.g., criminally-active areas), and chronic (e.g., poverty) stressors (Cairney, Boyle, Offord, & Racine, 2003; Lipman, Offord, & Byole, 1997). Prior research that has focused on the individual level, though limited, has found that single mothers are more likely than partnered mothers to experience stressors related specifically to personal health, parenting, poverty, and discrimination (Spjeldnes & Choi, 2007; Webster-Stratton, 1989). Even fewer studies have investigated youth stress in single-mother families. The limited research available highlights that children of single mothers experience more familial stressors (Aseltine, 1996) and traumatic childhood events (Daryanani et al., 2016). It is likely that other sources of stress more broadly attributable to the context of single motherhood (e.g., negative parenting, maternal depression, economic hardship) also have an impact on the frequency and severity of stress experienced by youth. Together, the various difficulties more likely to be experienced by children of single mothers likely compound

their risk for depression, as the accumulation of psychosocial risk factors exacerbates risk for the onset of adolescent depression (Lewinsohn, Roberts, Seeley, Rhode, Goltib, & Hops, 1994), potentially through increasing the risk for other well-established vulnerabilities for depression.

Two prominent etiological models of depression, hopelessness theory (Abramson, Metalsky, & Alloy, 1989) and response style theory (Nolen-Hoeksema, 1991), suggest that cognitive vulnerabilities confer risk for depression, with both models supported in adolescent samples (Hankin, 2006). Cognitive vulnerabilities - defined as maladaptive thought patterns and processes that influence the way individuals interpret and attend to environmental information - are frequently researched risk factors for, and consequences of, adolescent depression (for a review, see Alloy et al., 2012). Hopelessness theory (Abramson et al., 1989) posits that individuals are vulnerable to depression when they attribute the occurrence of negative events to global and stable causes and infer detrimental consequences and negative self-characteristics from the event's occurrence. This pattern of making negative inferences, which reflects cognitive vulnerabilities collectively referred to as negative cognitive styles or depressogenic inferential styles (DIS), increase an individual's sense of hopelessness over time. Over time, greater depressogenic inferential styles lead an individual to view him/herself as flawed or worthless in response to a negative event, as s/he is likely to believe negative events are his/her fault and will lead to future failures (Alloy et al., 2012; Hankin, 2006). In adolescent samples, negative cognitive styles are predictive of prospective depressive symptoms independently (Gibb & Alloy, 2006) and in combination with negative life events (Joiner, 2000). In addition, response style theory (Nolen-Hoeksema, 1991) posits that the way an individual responds to his/her distress influences future depression. Rumination, the most maladaptive response to stress within this model, is characterized by an excessive focus on one's depressed mood, often in the form of repetitive thoughts regarding the causes and consequences of the dysphoria (Nolen-Hoeksema, Wisco, & Lyumbomirsky, 2008). The repetition of negative thoughts during rumination inhibits an individual's ability to more adaptively respond to negative emotional states, such as by attending to less negative activities (distraction) or attempting to actively change the depressogenic circumstances (problem-solving). Children and adolescents who respond to distress with more rumination are at increased risk for onset of a depressive episode (Abela & Hankin, 2011; Stange et al., in press) and greater severity of depressive symptoms (Abela, Parkinson, Stolow, & Starrs, 2009).

These etiological models of depression have incorporated the critical role of stress and adopt a diathesis-stress framework, which posits that the interaction of vulnerabilities and stress confers added risk for depression. In addition to the role of stress in exacerbating pre-existing vulnerabilities in risk for depression, recent research suggests that stressful experiences can contribute to the development of cognitive vulnerabilities and subsequent depression in adolescents (e.g., Hamilton, Stange, Abramson, & Alloy, 2015; Michl, McLaughlin, Shepherd, & Nolen-Hoeksema, 2013). Although stress may broadly contribute to cognitive vulnerability formation, less research has considered whether adolescents of single-mother families are at greater risk for developing these cognitive vulnerabilities. However, the increased exposure to chronic and episodic stressors experienced by children of single mothers may compromise the development of adaptive cognitive styles, as

adolescents demonstrate greater vulnerability to depressogenic risk factors in the context of highly stressful environments (Lewinsohn, Joiner, & Rohde, 2001; Hamilton et al., 2015; Stange, Alloy, Flynn, & Abramson, 2013). Thus, it is possible that the increased stress experienced by single-mother families, relative to two-parent families, is associated with increased adolescent depressogenic inferential styles and ruminative response styles, which contribute to greater subsequent depression (e.g., Hamilton et al., 2015). Yet, this relationship has not been explored empirically. By investigating mechanisms within these cognitive etiological models that influence youth depression, researchers and clinicians can better understand how the context of single motherhood may negatively impact depressive symptoms and disorders in youth.

Developmentally, adolescence marks an ideal period to examine depression and the development of cognitive vulnerabilities to depression. Notably, there is a substantial increase in depression experienced from childhood to adolescence, with prevalence rates during adolescence converging on rates during adulthood (Hankin, 2006). When compared with children younger than 12 years old, adolescents report greater depressive symptoms (Ge, Lorenz, Conger, Elder, & Simons, 1994) and experience more depressive episodes (Cohen et al., 1993). There are also notable differences in depression during the course of adolescence, as late adolescents are nearly six times more likely to experience clinical levels of depression than early adolescents (Hankin, 2006). Thus, investigating depression across the course of adolescence (i.e., from early through middle and late adolescence) is critical to ascertain *when* risk factors for depression become impactful during adolescence. It is well-established that many psychosocial factors more broadly predictive of depression - including life stress, cognitive vulnerabilities, and interpersonal conflicts - are more likely to be encountered by adolescents than children (Hankin, 2006), and thus, may help explain the sharp increase in depressive rates. Moreover, although cognitive vulnerabilities such as rumination and negative inferential styles are present during childhood, they often consolidate during adolescence and develop into more robust, stable predictors of depression (Hankin, 2008a). Given that cognitive vulnerabilities and depression become more prevalent during adolescence, we believed that investigating differences in these variables across family structures would be most informative with an adolescent sample.

Additionally, it is critical to investigate gender differences when studying adolescent depression. Women are more likely to experience depression than men at a rate of 2:1 (Hankin, 2006), with gender differences first emerging during early adolescence. Numerous studies have concluded that children are at comparable risk for depression until early adolescence (i.e., ages 12–13 years), at which point adolescent girls begin to be more likely to experience depression than adolescent boys (for a review, see Hankin, 2006). Cognitive vulnerabilities have been examined as a mechanism that may help explain the emergent gender differences during adolescence, with prior research suggesting that adolescent girls are more likely to experience depression via cognitive vulnerabilities (Hankin & Abramson, 2002). Thus, it is possible that the influence of cognitive vulnerabilities on adolescent depression in single-mother families may be more impactful for girls than boys.

The Current Study

Youth of single mothers, relative to partnered mothers, experience greater levels of depression, an especially troubling difference given the increasing prevalence of single-mother families (Vespa et al., 2013). As single-mother families are more susceptible to a number of stressors, it is plausible that etiological models of depression that integrate the impact of stress may help explain differences in youth depression across family structures. Based on the hopelessness theory and response style theory, we hypothesized that adolescents of single mothers would be more likely than those of partnered mothers to experience greater cognitive vulnerabilities to depression, which would, in turn, predict greater depressive levels. Further, we theorized that greater exposure to childhood stressors may be one further mechanism through which adolescents of single mother households experience greater cognitive vulnerability and subsequent depression. More specifically, we hypothesized:

1. Adolescents in single-mother families will be more likely to experience depressive symptoms and disorders at prospective follow-ups than adolescents in two-parent families.
2. Adolescents in single-mother families will be more likely than those in two-parent families to experience greater depressogenic inferential styles and rumination, which will mediate the relationship between single motherhood status and greater prospective depressive symptoms and first onset of depressive disorders.
3. Adolescents in single-mother families will be more likely than those in two-parent families to experience higher levels of childhood stressors, which will mediate the relationship between single motherhood status and greater cognitive vulnerability (depressogenic inferential styles and rumination), which will predict subsequent depressive symptoms and first onset of depressive disorders.
4. The direct and indirect effects of single motherhood status on depressive symptoms and diagnoses via cognitive vulnerabilities will be moderated by youth gender.

Method

Recruitment

Participants were recruited from Philadelphia and its surrounding neighborhoods for the ACE Project, a multiwave prospective study that investigates vulnerability and resiliency to depression over the course of adolescence (see Alloy et al., 2012, for comprehensive study details). Participants were recruited from socioeconomically (26.2% below the poverty line) and racially (45.7% White) diverse neighborhoods (U.S. Census Bureau, 2012) that are predominately urban. As with the majority of major cities in the United States, a portion of these neighborhoods are characterized by high crime and low socioeconomic resources (U.S. Census Bureau, 2012). Mother-youth dyads (93% of the primary female caregivers in the sample were biological mothers) were recruited via mailing study information through Philadelphia-area middle schools with follow-up phone calls (68% of the sample) or

advertising in local newspapers (32% of the sample). Eligibility criteria stipulated that adolescents be 12- to 13-years old at baseline and identify as Caucasian/White, African-American/Black, or biracial (individuals of Hispanic descent were eligible if they also identified as White or Black). Inclusion criteria also stipulated that adolescents have a primary female caregiver who is willing to participate. Participant dyads were excluded if adolescents or their mothers had restrictions that hindered their ability to sufficiently complete the regular assessments, such as severe developmental or learning disabilities, psychosis, or an inability to read and speak English.

Participants

The study sample included 368 adolescents (Mean age, baseline = 12.85 years, $SD = 0.60$ years) and their mothers (Mean age, baseline = 41.96 years, $SD = 6.67$ years) who completed a baseline assessment and two yearly follow-up assessments. Self-identified race (50.0% White) and gender (50.0% female) were evenly represented among the adolescents. Approximately 49% of our participants were of low socioeconomic status (SES), operationalized as families who met criteria for subsidized school lunch. Subsidization is intended to assist families of low SES by providing discounted (or free) school lunches, taking into account family income and the number of dependents living in the household to determine eligibility. Based on demographic information provided by mothers, single motherhood ($n = 154$) was determined if a significant other (e.g. father, step-father, same-sex partner) was absent from the nuclear family.

Although there were 368 adolescents at the Time 1 assessment, only 287 adolescents (78% retention) returned to complete the Time 2 assessment, and 224 adolescents (61% retention) completed all three study assessments. Analyses were conducted to determine whether adolescents who completed the Time 1 assessment differed on demographic or primary study variables from those who returned to complete only the Time 2 visit or all three visits. These analyses revealed that adolescents with complete data had more negative depressogenic inferential styles at Time 1 ($t = 2.84$, $p < .01$), and were more likely to have a two-parent family ($\chi^2 = 8.45$, $p < .01$). However, the analytic plan to test our study hypotheses allowed us to include the full sample (see the Data Analytic Plan for more details).

Procedure

Dyads who met eligibility for participation were invited to the laboratory for a baseline assessment. Mothers consented, and youth assented, in writing to the study after they were provided a detailed description of the project. After consenting, mothers provided demographic information, which was used to ascertain single motherhood status. Mothers also reported on childhood stressors experienced by the child from birth until study entry (baseline), as well as completed a diagnostic interview on their own history of depression. Adolescents completed measures of current depressive symptoms, rumination, and depressogenic inferential styles. Diagnostic interviews were independently conducted about the adolescent's lifetime history of depression were also conducted at the baseline visit. At the first and second follow-ups, roughly one year and two years after baseline, respectively, adolescents again completed measures of their current depressive symptoms and cognitive

vulnerabilities. Mothers and adolescents also were interviewed at each follow-up to assess for adolescent depressive diagnoses. All procedures were approved by the investigators' Institutional Review Board.

Measures

Adolescent Rumination—The Children's Response Style Questionnaire (CRSQ; Abela, Rochon, & Vanderbilt, 2000), a 25-item self-report questionnaire that assesses response styles to depressed mood, was used to assess rumination. Modeled after the Response Style Questionnaire (Nolen-Hoeksema & Morrow, 1991) for adults, the CRSQ measures three distinct responses to depressed mood: rumination, distraction, and problem solving. Higher scores on the rumination subscale suggest a greater tendency to ruminate when experiencing sadness. In previous studies, the rumination subscale of the CRSQ was significantly associated with depressive symptoms (Abela, Brozina, & Haigh, 2002). Internal consistencies for the rumination subscale yielded α's of .82 (baseline), .81 (first follow-up) and .84 (last follow-up). Black and White adolescents have reported comparable levels of rumination on the CRSQ across several studies (Burwell & Shirk, 2007; Hankin, 2008b), which was corroborated in our study ($t = 1.50$ [T1]; 0.35 [T2]; 0.70 [T3]; all *ns*).

Adolescent Depressogenic Inferential Style—The Adolescent Cognitive Style Questionnaire-Modified (ACSQ-M; Alloy et al., 2012), a modified version of Hankin and Abramson's (2002) ACSQ, assesses depressogenic inferential styles in youth. Twelve hypothetical negative events are presented to participants to elicit inferential styles regarding negative events related to achievement, interpersonal relationships, and appearance. Items presented with each hypothetical event ask participants to make inferences regarding the causes, consequences, and implications for self-worth of the negative event on a 1 to 7 scale. Higher scores suggest a more negative (i.e. depressogenic) inferential style. We utilized an overall negative composite score (overall DIS) in analyses, which was computed by summing the various inferential style dimensions across the three event domains. Past research indicates that the ACSQ and ACSQ-M have adequate factor structures as measurements of depressogenic cognitive vulnerabilities during adolescence (Alloy et al., 2012; Hankin & Abramson, 2002). Internal consistencies for the overall composite score yielded α's of .94, .95, and .95 for baseline, first follow-up, and last follow-up visits, respectively. The measure was originally validated with a sample of racially diverse adolescents (Hankin & Abramson, 2002), with similar reporting across Black and White adolescents. Although Black and White adolescents in our samples reported comparable levels of overall depressogenic inferential style at baseline ($t = 0.28$, $p = 0.78$) and the first follow-up ($t = 1.69$, $p = 0.93$), White adolescents reported higher overall depressogenic inferential style than Black adolescents at the last follow-up ($t = 2.58$, $p = 0.01$).

Adolescent Depressive Symptoms—The Children's Depression Inventory (CDI; Kovacs, 1985) assesses depressive symptoms in children and adolescents. Adolescents completed the 27-item questionnaire based on cognitive, affective, and behavioral symptoms they had experienced over the past two weeks. We used the CDI total score as a continuous variable with a possible range of zero to 54, with higher scores reflecting more severe depressive symptoms. The CDI is widely used in research and has been consistently

identified as a reliable and valid measure of depression (for a review, see Klein, Dougherty, & Olino, 2005). If suicidal ideation was endorsed (Item #9), a trained interviewer conducted a suicide risk assessment with the adolescent, with a comprehensive protocol in place when imminent threat was suspected. Cronbach's alpha for our study yielded α's = .85, .89, and .86 for baseline, first follow-up, and last follow-up, respectively. The CDI has been used in Black and White child samples with comparable validity and reliability (McLaughlin, Hilt, & Nolen-Hoeksema, 2007; Twenge & Nolen-Hoeksema, 2002), and our sample of adolescents did not differ on depressive symptoms across race (t = 0.41 [T1]; 1.52 [T2]; 1.11 [T3]; all *ns*).

Adolescent Depressive Diagnoses—The Kiddie-Schedule for Affective Disorders and Schizophrenia-Epidemiological Version (K-SADS-E; Orvaschel, 1995) is a semi-structured diagnostic interview that assesses psychopathology as per the Diagnostic and Statistical Manual of Mental Disorders (*DSM-IV-TR*; American Psychological Association, 2000). Diagnosticians, who completed roughly 200 hours of didactic and experiential training prior to assessing participants, included postdoctoral fellows, clinical psychology doctoral students, and post-baccalaureate research assistants. Adolescents and their mothers were independently interviewed at baseline and each follow-up, and the interviewer created a summary rating based on his/her "best-estimate" clinical judgment for all diagnoses. We utilized depression diagnoses (meeting criteria for major depressive disorder, dysthymia, or sub-threshold depression) for analyses. Sub-threshold diagnoses included depressive episodes lasting at least two weeks but with three to four symptoms, or depressive episodes with five or more symptoms that lasted one to two weeks. Inter-rater reliability based on 120 pairs of ratings (ten interviews with 24 total diagnoses, rated by five interviewers) was κ = .85.

Maternal Depressive Diagnoses—The Schedule for Affective Disorders and Schizophrenia-Lifetime (SADS-L; Endicott & Spitzer, 1978) is a semi-structured diagnostic interview that was used to assess maternal history of depression. For our study, an expanded version of the SADS-L (Alloy et al., 2008) was used to accurately capture symptoms of mood disorders as per the *DSM-IV-TR* (American Psychological Association, 2000). Diagnosticians, who completed roughly 200 hours of didactic and experiential training prior to assessing participants, included postdoctoral fellows, clinical psychology doctoral students, and post-baccalaureate research assistants. Mothers were interviewed at the baseline visit, and those who met criteria for major depressive disorder (MDD) at some point in their past were rated positively as having a history of depression. Based on 100 interviews, inter-rater reliability compared with an expert psychiatric diagnostician yielded κ = .86.

Childhood Stressful Events—The Children's Life Events Scale (CLES; Crossfield, Alloy, Gibb, & Abramson, 2002), which is an expanded form of the Source of Stress Inventory (Chandler, 1981), assesses 50 different negative events that may have occurred throughout childhood. The items capture moderately to majorly severe events, with a total score derived from summing the number of positively endorsed events from the following domains: disruptions of family structure, parental hardships, family deaths, maltreatment,

negative emotional feedback, achievement-related failures, and experiences of inadequacy. Mothers identified whether stressful events happened to their child at any point from birth to the baseline visit; youth reports were not obtained, as some early-life stressors may be difficult for adolescents to accurately report. Across several studies, the CLES has been demonstrated to predict mood disturbances (Crossfield et al., 2002; Grandin, Alloy, & Abramson, 2007).

Results

Data Analytic Plan

Path analysis with structural equation modeling (SEM) software (Mplus 7.0; Muthén & Muthén, 2007) with full information maximum likelihood estimation (FIML) was used to examine whether there were significant relationships between the independent variable (IV; single motherhood status), mediators (M; childhood stressors, rumination, overall depressogenic inferential styles), and dependent variables (DV; youth depressive symptoms and disorders). FIML allowed parameters to be estimated for all 368 participants, including those with the presence of missing data. However, analyses also were conducted with only those 224 participants with complete data, and results were similar to those presented here based on the whole sample. All path models were prospective (i.e., the IV preceded measurement of the M, which preceded measurement of the DV) and each path controlled for youth race, youth gender, SES, maternal history of depression, and baseline scores on measures of youth depression and cognitive vulnerabilities. Fit statistics were examined for each model to determine whether the model adequately fit the data (Hu & Bentler, 2007).

First, we conducted path analyses to estimate the direct effects of single motherhood status on prospective adolescent depressive symptoms and diagnoses, controlling for baseline levels of adolescent depression. Then, we conducted models with adolescent cognitive vulnerabilities predicting to depressive symptoms and depressive disorders (simple mediation), and models with childhood stressors and adolescent cognitive vulnerabilities predicting to depressive symptoms and depressive disorders (sequential mediation), yielding a total of four models testing both direct and indirect effects simultaneously. Specifically, we estimated the direct effects of single motherhood status on adolescents' stressors (CLES) and cognitive vulnerabilities (rumination and depressogenic inferential styles), as well as the effects of childhood stressors on cognitive vulnerabilities, and stressors and cognitive vulnerabilities on depressive symptoms and new onset of depressive disorders. We also estimated the indirect effects of single motherhood status on depressive symptoms and disorders via cognitive vulnerabilities (simple mediation), as well as the effects of single motherhood status on depressive symptoms and disorders via childhood stressors and cognitive vulnerabilities (sequential mediation). To meet criteria for mediation, each pathway in the model must be significant and the direct effect between the independent and dependent variables must be reduced when the mediator is entered into the model (i.e., a significant indirect effect). We covaried for baseline adolescent depressive symptoms and adolescent current or past depressive disorders for all analyses. We also controlled for baseline rumination for the mediation analyses via rumination, and covaried for baseline

depressogenic inferential styles when conducting analyses of mediation by depressogenic inferential styles.

Preliminary Analyses

Descriptive statistics for the primary study variables and demographics are displayed in Table 1 by single motherhood status. Consistent with the majority of single mother research (Goodrum et al., 2012), single mothers in our study were significantly more likely than partnered mothers to be Black ($\chi^2 = 28.99$, $p < .001$) and of low SES ($\chi^2 = 35.55$, $p < .001$); consequently, race and SES were included as covariates. Youth gender was evenly represented across family structure ($\chi^2 = 1.91$, $p = .28$), but was controlled for in prospective analyses because girls were more likely than boys to report greater rumination ($t = 4.66$, $p < .001$) at the first follow-up, as well as greater depressive symptoms at the second follow-up ($t = 2.51$, $p = .01$). Black adolescents were more likely than White adolescents to be from low SES families (see Table 2) and have lower levels of overall depressogenic inferential styles at the last follow-up only ($t = 2.58$, $p = 0.01$). Both cognitive vulnerabilities were correlated with one another at baseline and prospective follow-ups (Table 2). Additional bivariate correlations between primary study variables are presented in Table 2. Further, 176 mothers (47.80%) reported a past history of depression, whereas 54 adolescents (14.67%) reported a past or current episode of depression at the first follow-up. There were 29 adolescents with first onset of depression at the second follow-up. At baseline, adolescents across family types experienced comparable levels of rumination ($t = 1.05$, $p = .29$), overall depressogenic inferential style ($t = 1.15$, $p = .25$), depressive symptoms ($t = 1.45$, $p = .59$), and depressive diagnoses ($\chi^2 = .03$, $p = .86$).

Hypothesis Testing

Hypothesis (1): Single Motherhood and Youth Depressive Symptoms and Diagnoses—We first examined whether youth in single-mother families experienced more prospective depressive symptoms and first onset of depression than youth in two-parent families. Adolescents of single mothers were more likely to experience greater depressive symptoms at the second follow-up (Time 3) than adolescents of cohabitating mothers ($\beta = .21$, $p < .001$). Single motherhood predicted adolescent depressive symptoms beyond the influences of youth race, youth gender, SES status, maternal history of depression, and baseline adolescent depressive symptoms and diagnoses; the only covariate significantly associated with youth depressive symptoms at the second follow-up was baseline CDI score ($\beta = .32$, $p < .001$). In contrast, single motherhood did not predict first onset of adolescent depressive diagnoses at Time 3 ($\beta = .11$, $p = .40$). Thus, our first hypothesis was partially supported.

Hypothesis (2): Single Motherhood, Youth Cognitive Vulnerability, and Depression—We then examined whether youth in single-mother families experienced more prospective depressive symptoms and episodes via greater depressogenic inferential styles or rumination. For the model with depressogenic inferential style (Figure 1), the model fit was satisfactory; $\chi^2(4) = 3.61$, as indicated by the comparative fit index (CFI) = 1.00; root mean square error of approximation (RMSEA) = .03; and standardized root mean square residual (SRMR) = .01 (Hu & Bentler, 2007). Within this model, we first examined

whether single motherhood predicted adolescent prospective DIS. Contrary to hypotheses, youth in single-mother families exhibited similar levels of overall DIS (β = .04, p = .60) at the first follow-up as adolescents in two-parent families, controlling for youth gender and race, SES status, baseline DIS, baseline depressive symptoms, and maternal depression in the model. Consequently, the first part of our second hypothesis was unsupported. Although the direct effect of overall DIS on depressive symptoms was significant (β = .24, p < .001), overall DIS did not predict first onset of depressive disorders (β = −.03, p = .76). Further, the indirect effects were not significant from single-mother families via overall DIS to depressive symptoms (β = .01, SE = .02, p =.55) or depressive disorders (β < .01, SE < .01, p = .76).

Although depressogenic inferential styles did not emerge as a mediator, we also postulated that youth in single-mother families would be more likely to ruminate, relative to youth in two-parent families, which, in turn would predict greater prospective youth depressive symptoms and first onset of depression. For this second part of Hypothesis 2 (Figure 2), the model fit was excellent predicting to depressive symptoms; χ^2 (4) = 1.66, as indicated by the comparative fit index (CFI) = 1.00; root mean square error of approximation (RMSEA) < .001; and standardized root mean square residual (SRMR) < .001 (Hu & Bentler, 2007). Controlling for youth gender, race, SES, baseline rumination, baseline depressive symptoms and disorders, and maternal depression in the model, we found that youth in single-mother families exhibited significantly greater rumination at the first follow-up than adolescents in two-parent families. Additionally, adolescent girls were more likely to ruminate than boys. Consistent with hypotheses, rumination at first follow-up predicted greater depressive symptoms and disorders at second follow-up (Figure 2). Further, a significant indirect effect via rumination indicated that adolescents in single-mother families were more likely to experience high levels of rumination than adolescents in two-parent families, which subsequently predicted greater depressive symptoms (B = 0.04, SE = 0.02, p < .05). However, there was not a significant indirect effect from single-mother families to first onset of depressive disorder via rumination (β = .03, SE = .02, p = .11). Thus, this part of our second hypothesis was partially supported, as greater rumination emerged as a significant mediator between single motherhood and increased youth depressive symptoms, but not disorders. Results indicated that the model explained a significant amount of variance in rumination (36%), depressive symptoms (25%), and depressive disorders (10%).

Hypothesis (3): Single Motherhood, Childhood Stressors, Youth Rumination, and Depression—We then examined whether youth in single-mother families experienced more prospective depressive symptoms and disorders via childhood stressors and youth cognitive vulnerability. Given that depressogenic inferential style was not a significant mediator, we did not examine sequential mediation with depressogenic inferential style, but examined childhood stressors as a potential mediator of the relationship between single-mother families to youth rumination and subsequent depression (symptoms and disorders). First, we examined whether youth of single-mother families experienced greater childhood stressors, finding that adolescents in single-mother families were more likely to experience more negative childhood stressors (β = .17, SE = .05, p = .001).

The model fit was satisfactory; $\chi^2(10) = 22.8$, $p = .01$, as indicated by the comparative fit index (CFI) = .94; root mean square error of approximation (RMSEA) = .06; and standardized root mean square residual (SRMR) = .03 (Hu & Bentler, 2007). Within this model, we examined whether childhood stressors predicted adolescent prospective rumination. Consistent with our third hypothesis, childhood stressors predicted higher levels of rumination (β = .17, SE = .07, $p = .02$), controlling for youth gender, race, SES status, baseline rumination, baseline depressive symptoms and episodes, and maternal depression in the model. In addition, there was evidence of a trend towards significance for childhood stressors mediating the relationship between single-mother families and youth rumination levels (β = .03, SE = .02, $p = .05$). Finally, there also was a marginally significant indirect effect of the sequential mediation model from single-mother families to depressive symptoms (but not disorders) via childhood stressors and rumination (β = .01, SE = .01, $p = .08$).

Hypothesis (4): Does Youth Gender or Race Moderate the Relationship between Single Motherhood and Youth Cognitive Vulnerabilities and Depression?—To determine if there were significant differences in the paths by youth gender, we examined the models using multi-group comparison analyses. All paths were fully constrained to be equal for boys and girls separately for each model, and then partially constrained so that only the covariates were equally estimated in the model. First, examination of the differences on the chi-square tests between the constrained model and partially constrained model with depressogenic inferential styles, depressive symptoms and disorders revealed that there were no significant differences across gender, $\Delta\chi^2(5) = 3.26$, which does not meet the criteria for the significance cut-off ($\chi^2 = 11.07$). For the rumination model, examination of the differences on the chi-square tests between the constrained and partially constrained models with depressive symptoms and disorders revealed that there were no significant differences across gender, $\Delta\chi^2(5) = 9.22$, which does not meet the criteria for the significance cut-off ($\chi^2 = 11.07$). Thus, all paths were equal across adolescent boys and girls for both models for rumination and depressogenic inferential styles, rendering our final hypothesis unsupported.

In addition, given the unique nature of our sample and racial differences in family composition, we also explored whether there were significant differences in the paths for White and Black youth. Thus, we examined the models using multi-group comparison analyses by youth race. All paths were fully constrained to be equal for Black and White youth separately for each model, and then partially constrained so that only the covariates were equally estimated in the model. First, examination of the differences on the chi-square tests between the constrained model and partially constrained model with depressogenic inferential styles and rumination revealed that there were no significant differences across race, $\Delta\chi^2(5) = 3.36$, $\Delta\chi^2(5) = 5.891$, respectively, which do not meet the criteria for the significance cut-off ($\chi^2 = 11.07$). Thus, the models were comparable for White and Black adolescents.

Alternate Hypotheses—Given that we did not find significant effects for the models with depressogenic inferential styles, we decided to test an alternative method for calculating

depressogenic inferential styles to confirm the specificity of our findings to rumination. Specifically, consistent with the hopelessness theory, the results above were conducted with depressogenic inferential styles calculated as the overall composite of all inferential domains (e.g., stable, global, internal, self, and consequences). However, the weakest link approach proposed by Abela and Sarin (2002) suggests that cognitive style may not yet be consolidated by the early adolescent period. Specifically, they suggest that a better representation of an individual's cognitive risk for depression may be the "weakest" or highest domain of the negative inferential style. Thus, the highest score (most negative) domain is used to represent depressogenic inferential style. Consequently, individuals may have different domains of cognitive style reflected in the score, which reflects a more individualized measure of cognitive vulnerability and inferential style. Thus, we conducted the above-mentioned analyses with the “weakest-link” inferential style as well. Despite the changes to the depressogenic inferential styles calculations, all reported results were generally consistent.

Discussion

The increased number of children raised by single mothers has stimulated extensive research on youth adjustment in single-mother and two-parent families. As research has consistently identified single motherhood as a risk factor for youth depression (Daryanani et al., 2016; Hilton & Devall, 1998), it is important to understand why children of single mothers are at greater risk for depression than children of partnered mothers. The results of our analyses indicate that youth raised in single-mother families are at increased risk for depression due, in part, to engaging in more ruminative processes. Specifically, early adolescents from single-mother families were more likely to report higher levels of rumination over a one-year interval than early adolescents from two-parent families, which predicted greater youth depressive symptoms two years after baseline. Contrary to our hypotheses, adolescents in single- and two-parent families reported comparable levels of depressogenic inferential styles; promisingly, this suggests that the context of single motherhood does not negatively influence adolescents’ inferences about the causes and consequences of negative events. Further, consistent with hypotheses and prior research, our findings indicate that youth raised in single-mother families are more likely to be exposed to childhood stressors. Contrary to expectations, childhood stress only emerged as a marginally significant mediator of the relationship between single-mother households and higher prospective levels of adolescent rumination.

Examining changes in adolescent vulnerabilities and depression longitudinally yield fairly similar trends, signaling important developmental considerations. Adolescents from single-mother families did not experience greater depressive symptoms relative to adolescents from two-parent families until the second follow-up, in line with the well-established finding that the prevalence of depression increases during adolescence and converges on adulthood prevalence rates (Compas, Ey, & Grant, 1993; Hankin et al., 1998). Similarly, differences in adolescent rumination between family structures emerged at the first follow-up but were not present at baseline, a finding supported by the notion that cognitive vulnerabilities typically develop over the course of adolescence (Gibb & Alloy, 2006). Although cognitive vulnerabilities to depression are believed to first emerge in late childhood and early

adolescence, it is often not until later in adolescence that these factors become more trait-like and predictive of depression (Hankin, 2008). As our findings suggest that elevated rumination during *early* adolescence is associated with increased prospective depressive symptoms specifically for youth of single mothers, it is possible that rumination has an earlier impact on adolescent development in single-mother families than in two-parent families. Consistent with this postulate, stressful life events are experienced more regularly, and interpreted as more impactful, during adolescence, with much research concluding that elevated stress is a prominent risk factor for adolescent depression (e.g., Hamilton et al., 2013). As children of single mothers are at risk for chronic stressors before the onset of adolescence (Daryanani et al., 2016; Lipman et al., 1997), it would likely take less additional stressors during adolescence to compromise a child's ability to adequately cope, which in turn puts them at earlier risk for depression than adolescents from two-parent families. We found partial support for this theory, as our analyses revealed that stressful events during childhood were more common among adolescents of single mothers and predicted elevated rumination, although there was only trending significance of childhood stressors as a mediator of this relationship.

Developmentally, rumination more broadly hinders a myriad of psychosocial outcomes via decreasing the cognitive resources available for adolescents to engage in effective problem-solving (Lakdawalla, Hankin, & Mermelstein, 2007). Given the widespread impact of rumination on psychosocial development, adolescents from single-mother families may be at greater risk for various difficulties throughout adolescence due to elevated ruminative levels in early adolescence (and consequently reduced abilities to problem-solve that compound throughout the course of adolescence). As problem-solving is considered a critical skill for adolescents given the greater potential for dangerous activities and peer influence during this period, adolescents from single-mother families also may be more likely to engage in risky behaviors than adolescents from two-parent families (e.g., Covey & Tam, 1990; Kincaid et al., 2010) due to elevated ruminative levels (and hindered problem-solving ability). This general developmental risk of rumination is compounded with the robust finding that increased rumination during adolescence is predictive of more frequent and severe depression into adulthood (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008), rendering the early development of rumination in adolescents of single mothers a noteworthy risk factor for various negative psychosocial outcomes.

The most notable finding is the specificity with which single-motherhood influences adolescent vulnerability to depression. Adolescent depressogenic inferential style levels were similar across family types, whereas adolescents raised by single mothers engaged in more rumination. Although we hypothesized that adolescents in single-mother families would experience more negative cognitive styles and rumination, there are several potential explanations for why adolescents of single mothers would experience elevated rumination, but not depressogenic inferential styles. First, although stress is predictive of rumination (Michl et al., 2013) and negative cognitive styles (Hamilton et al., 2015), negative contextual factors common to single-mother families may be more impactful on adolescent ruminative processes. It is possible that ruminative processes are especially elevated in adolescents of single mothers because the chronic nature of stressors experienced by single-mother families - such as low SES-related stress, neighborhood danger, and lack of coparent involvement -

compounds with elevated exposure to episodic stressors during adolescence (Compas et al., 1993). As research more consistently associates elevated stress with rumination than depressogenic inferential styles (Michl et al., 2013), chronic stressors experienced by single-mother families may confer specific risk to offspring rumination. In turn, this may compound the amount of stress a child attempts to emotionally process over time, rendering it more difficult to regulate emotional responses during adolescence due to cognitive burden (Michl et al., 2013). Moreover, adolescents in single-mother families often assume mature roles, and household responsibilities (Weiss, 1979), at earlier ages than adolescents from two-parent families, which may put them at earlier risk for stress in these domains (Weiss, 1979).

Our analyses with childhood stressors found partial support for this postulation, as single mothers were more likely than partnered mothers to report major stressful events in their adolescents' childhoods, and childhood stressors were predictive of elevated rumination. However, we only found support for a marginally significant indirect pathway of the mediational model (such that greater childhood stressors for youth of single mothers predicted to greater rumination, which, in turn, predicted elevated depressive symptoms). Although our findings are consistent with prior research indicating that stressors contribute to ruminative tendencies (Hamilton et al., 2015; Michl et al., 2012), our results indicate that there may be other mechanisms through which adolescents of single mother households develop ruminative tendencies over time. In particular, it is likely that current stressors are more strongly associated, relative to childhood stressors, with adolescent rumination and subsequent depression in single-mother families. However, it is also possible that improved measures of childhood stressors would better detect the effects of chronic and episodic stressors experienced by adolescents of single-mother families. Additionally, adolescents in single-mother families may be more likely to ruminate because they are more likely to encounter co-rumination (ruminating on stressors within a dyadic relationship; Rose, 2002). As single mothers are more likely than partnered mothers to experience depression (Lipman, Offord, & Boyle, 1997), they may be more likely to ruminate with their children (Grimbos, Granic, & Pepler, 2013) and provide a model for ruminative processes. Moreover, socioeconomic difficulties experienced by single mothers hinder the amount of time they are able to spend with their children (Kendig & Bianchi, 2008); consequently, their children may be more likely to seek support from peers, which can often lead to co-rumination during the period of adolescence (Rose et al., 2016).

Alternatively, adolescents from single-mother families may not be more susceptible to depression via elevated negative inferential styles because they are able to attribute the additional stressors in their lives to the difficulties of having one less parent, rather than personal deficits or inadequacies. It is important to note that although youth of single mothers were not more susceptible than youth of partnered mothers, depressogenic inferential styles were predictive of depressive symptoms across the entire adolescent sample. Adolescent overall depressogenic inferential style in our sample is comprised of factors such as making inferences about the causes of negative events (e.g., negative events are mainly due to the individual and will affect many domains of life) and making inferences regarding self-worth (e.g., the occurrence of stressors means an individual is fundamentally flawed). As hopelessness theory posits that individuals develop a negative cognitive style via

making negative self-inferences about the occurrence of stressors (Abramson et al., 1989), adolescents of single mothers may be at lower risk for developing negative inferential styles, relative to rumination, due to experiencing stressors that are easier to identify as externally caused. Thus, adolescents in single-mother families may attribute negative life events to external causes – such as the chronic stress associated with low SES or the increased burden of single parenthood - and consequently eschew negative inferences about self-worth (e.g., the nature of the stress is more readily attributable to family structure dynamics than personal flaws), which would reduce their risk of experiencing elevated negative cognitive styles. Consistent with this postulate, childhood stressors were not predictive of depressogenic inferential styles. Additionally, negative paternal, but not maternal, parenting is associated with elevated depressogenic inferential styles in children (Alloy et al., 2001); thus, the decreased interactions between children of single mothers and their fathers may serve to protect these adolescents from the potentially deleterious influence of negative paternal parenting on depressogenic inferential styles. However, these ideas are highly speculative given the novelty of this research with single-mother families, and further investigation of these factors, especially youth stress, is important for future research.

Further, we did not find support for our hypothesis that cognitive vulnerabilities experienced by adolescents of single mothers would predict more severe depression for girls than boys. Prior research suggests that adolescent girls are more likely than adolescent boys to experience depression via elevated cognitive vulnerabilities (Hankin & Abramson, 2002); thus, we were surprised that boys and girls in single-mother families were at comparable risk for depressive symptoms via rumination. Although gender differences in depression often emerge in early adolescence (ages 12–13), girls are at increasing risk for depression as they progress through adolescence, converging on their twofold risk, relative to men, for depression in adulthood (Hankin, 2006). As our sample followed youth from early through middle adolescence, it is possible that cognitive vulnerabilities are not significantly more impactful for girls than boys until the later years of adolescence, when the gender difference in depression is at its largest (i.e. above age 16). Although we did not hypothesize that girls would be more likely to ruminate than boys in single-mother families, it is important to note that girls often do not experience elevated rates of cognitive vulnerabilities until later adolescence (Hamilton et al., 2013; Hankin, 2008), further suggesting that late adolescence may be the critical period for gender differences to fully establish for cognitive vulnerabilities to depression. Further, our results also highlight the importance of these findings for youth who are both White and Black, as the effects of single-mother families on rumination and depression were consistent for youth of both races.

Identifying mechanisms through which single motherhood confers risk for adolescent depression is valuable because it can help guide clinical intervention. Although rumination is a well-established vulnerability to youth depression, our study suggests rumination is especially elevated in adolescents of single mothers and may be a worthwhile point of intervention. Stressful events are more impactful on ruminative processes for adolescents in single-mother families, relative to those from two-parent families, and clinicians should be mindful that it may take less environmental stressors to comprise their coping abilities. Moreover, consideration of the major childhood stressors experienced by adolescents in single-mother families can benefit clinicians' conceptualizations of the adolescents'

presenting problems and help signal risk for problematic rumination. Family therapists should encourage reflective and compassionate parent-child discussions about emotions in order to help adolescents feel comfortable and supported as they explore effective ways to respond to stressors. To counteract the negative cycle of ruminative thoughts and depressive symptoms, clinicians can work with adolescents to find positive distractions in the short-term (as a form of behavioral activation and to improve one's mood before engaging in problem-solving), develop ways to mitigate negative automatic thoughts and their associated distress (e.g., through cognitive restructuring and acceptance-based approaches), and practice mindfulness to notice negative thoughts without judgments (for a review, see Nolen-Hoeksema et al., 2008). Finally, given that single-mother families are likely to be disadvantaged in ways that may influence their ability to receive therapeutic services (e.g. low SES, time constraints due to multiple jobs, child supervision responsibility), feasible accommodations should be explored such as income-adjusted (i.e. sliding scale) fees and transportation accommodation. Alternatively, single-mother families who do not have the time or finances to commit to consistent therapy can still benefit from psychoeducation, and workshops intended to educate mothers on the importance of supporting adolescents as they respond to stress may be a cost-effective method of dissemination and prevention. Further, it can be beneficial to provide workshops for single mothers that address methods to effectively cope with the additional stressors of single parenthood, as mothers continue to be models for ruminative processes as their children progress through adolescence (Yap, Allen, & Sheeber, 2007).

Interpretation of our results should take into account the study's strengths and limitations. Although converging evidence suggests that youth in single-mother families are at increased risk for depression, our study is the first to examine adolescent cognitive vulnerabilities to depression in single-mother families and is informed by two established etiological models of depression. The prospective, longitudinal design allowed us to incorporate three distinct time points to test for indirect effects (Preacher & Hayes, 2008), using a diverse community sample of adolescents and their mothers. Further, we employed fairly conservative tests of all mediation models. By controlling for youth gender, race, maternal depression, and SES status, we accounted for the possible influence of these factors on adolescent depression more generally. Further, controlling for baseline depressive symptoms and baseline cognitive vulnerabilities allowed us to more strongly suggest that adolescent rumination predicts, and does not simply accompany, increased prospective depressive symptoms in single-mother families.

It is also important to acknowledge limitations of the study. Although we employed fairly conservative tests of all hypotheses, it is possible that other contextual factors common to single-mother families (such as familial stress, low maternal emotional support, increased role responsibilities, coparent relationship) also account for the relationship between single-motherhood and adolescent depressive symptoms. Similarly, the lack of examination of current youth stress as it interacts with cognitive vulnerabilities to predict depression is a limitation of the current study. Future research should aim to explore this interaction to more fully test the vulnerability-stress framework of these models, as our examination of past youth stressors was predictive of rumination but not depression. Although our study is generalizable to Black and White families of various socioeconomic statuses in the United

States, our findings may not be consistent in families of other cultures or races. It is also important to note that although single motherhood was predictive of youth depressive symptoms, it was not related to youth depressive disorders. A general limitation of research on children of single parents, including our study, is the relative lack of research on single-father families, and our results may not be generalizable to adolescents who are raised in these families. Finally, future research should attempt to investigate the duration of co-parent absence as an influence on youth depression and its antecedents.

Conclusion

Although our study suggests that adolescents raised by single mothers are at increased risk to experience depressive symptoms, it is important to note that the majority of children raised by single mothers do not experience psychosocial maladjustment (Shook et al., 2010). To date, including the present study, no research has suggested that single mothers are inferior parents or directly provide risk-laden environments for their children. Rather, it is far more likely that negative contextual factors commonly associated with single motherhood (Cairney et al., 2003) negatively influence children and their mothers, both independently and interdependently. Consistent with this postulate, major childhood stressors were experienced more often by adolescents of single mothers and were predictive of greater adolescent rumination, suggesting stressful events may be more impactful on ruminative processes for adolescents without a coparent. Moreover, greater rumination predicted depressive symptoms for adolescents in single-mother, but not two-parent, families relatively early in adolescence, suggesting rumination may have a lasting impact on negative psychosocial development for youth of single mothers (e.g., depression, anxiety, risky behaviors; Covey & Tam, 1990; Michl et al., 2013) throughout the course of adolescence and into adulthood. Although the most helpful interventions would influence or change the negative context directly, this may not be feasible or fiscally viable. By identifying rumination as a mechanism that predicts differences in adolescent depression across single-mother and two-parent families, we hope to better guide clinicians and researchers in their work with underserved families.

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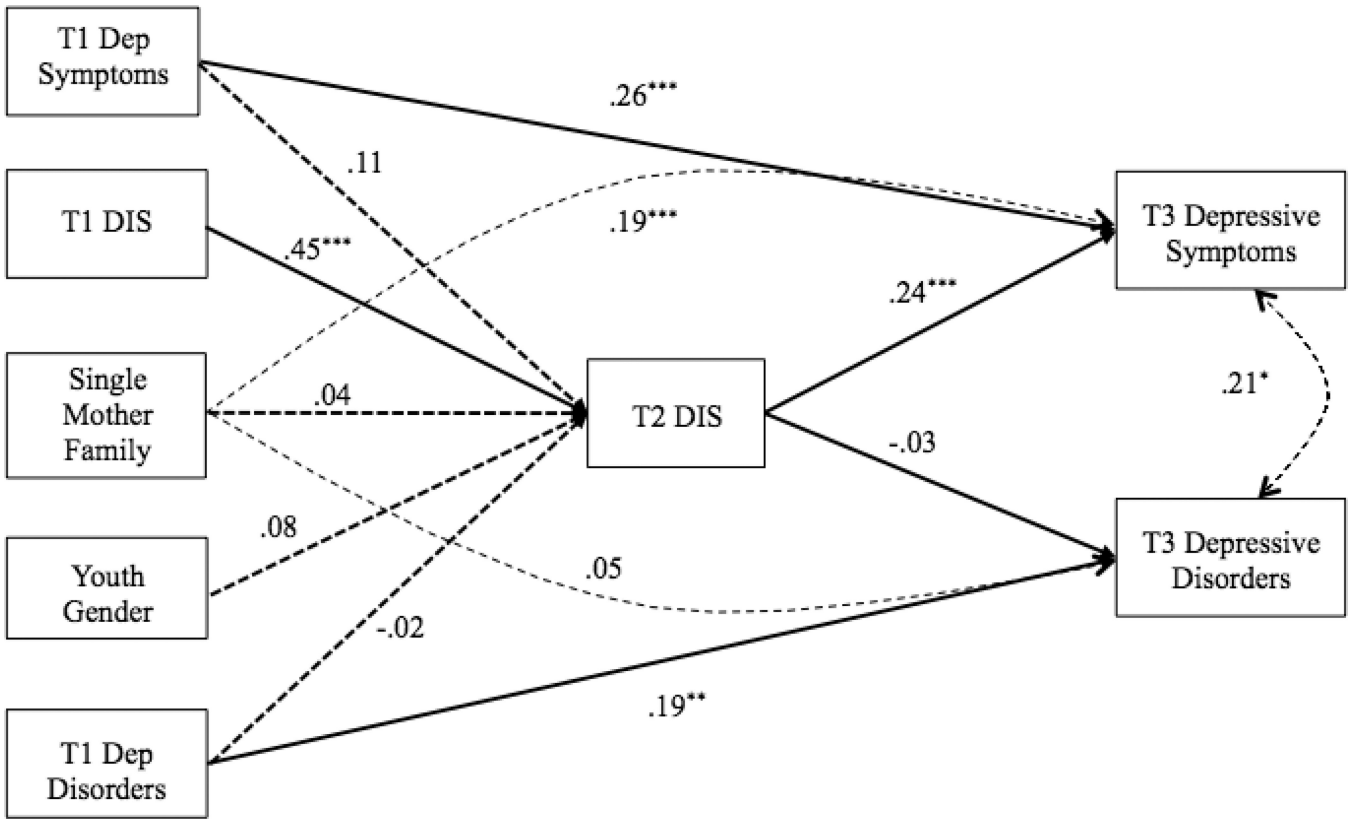

Figure 1.

DIS as a Mediator Between Single-Mother Families and Adolescent Depressive Symptoms and Disorders

Note. T1 = Time 1; T2 = Time 2; T3 = Time 3; DIS = depressogenic inferential style; Dep = depressive. Standardized coefficients are presented above. There were additional paths included in the model that are not displayed in the figure for clarity. These include paths between race, maternal depression, SES and the mediator (DIS) and depression.

*p <.05; **p < .01; ***p < .001

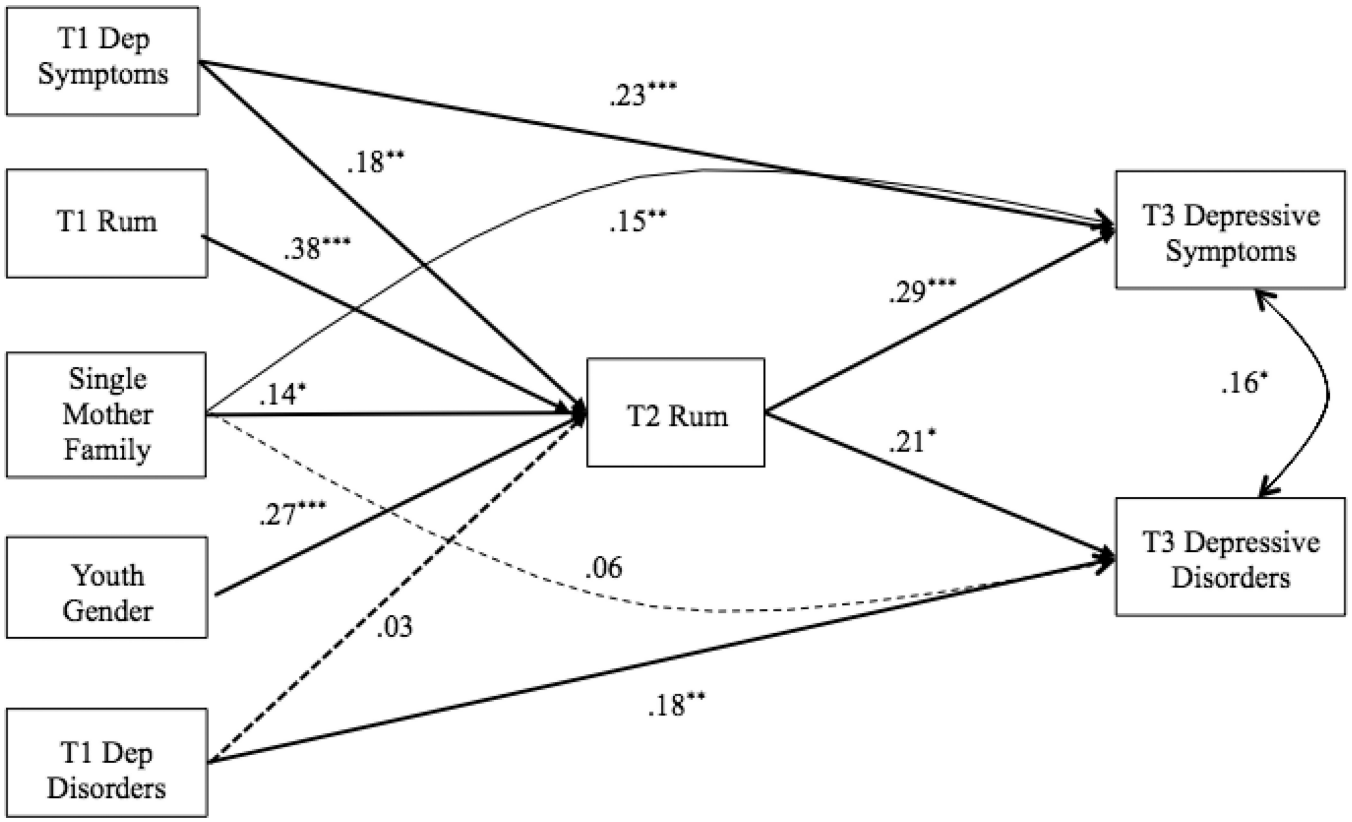

Figure 2.

Rumination as a Mediator Between Single-Mother Families and Adolescent Depressive Symptoms and Disorders

Note. p <.05*, p < .01**, p < .001***. T1 = Time 1; T2 = Time 2; T3 = Time 3; Rum = rumination; Dep = depressive. Standardized coefficients are presented above. There were additional paths included in the model that are not displayed in the figure for clarity. These include paths between race, maternal depression, SES and the mediator (rumination) and depression.

*p <.05; **p < .01; ***p < .001

Table 1

Descriptive Statistics and Differences in Study Variables by Single Mother Status

Maternal Characteristics	Single Mothers		Cohabitating Mothers
n	154		214
Age, Baseline	41.36 (6.58)		42.24 (6.71)
Race[1] (White)	25 (33%)	***	92 (62%)
Low SES	103 (67%)	***	77 (36%)
MDD History	71 (46%)		105 (49%)
Youth Characteristics			
Gender (Female)	71 (46%)		112 (52%)
Age, Baseline	12.90 (0.58)		12.82 (0.61)
Rumination, Baseline	25.03 (7.50)		24.15 (8.24)
Rumination, 1st Follow-up	24.52 (9.48)	*	22.76 (6.78)
DIS Overall, Baseline	114.21 (40.79)		119.03 (38.90)
DIS Overall, 1st Follow-up	117.71 (46.76)		113.80 (42.77)
CDI, Baseline	7.15 (5.55)		6.83 (6.97)
CDI, 2nd Follow-up	7.88 (6.77)	**	5.39 (4.84)
Dep Dxs, Baseline	23 (14.94%)		31 (14.42%)
New Dep Dxs, 2nd Follow-up	13 (8.44%)		16 (7.44%)

Note.

[1]Race is coded as White or Black. Low SES = families eligible for subsidized school lunch; MDD = major depressive disorder; DIS = depressogenic inferential style; CDI = Children's Depression Inventory; Dep Dxs = depressive disorders. Means are presented with standard deviations in parentheses, if applicable.

*p <.05;

**p < .01;

***p < .001

Table 2

Bivariate Correlations Between Primary Study Variables

		1	2	3	4	5	6	7	8	9	10
1.	Single Motherhood	-----									
2.	Low SES	.26***	-----								
3.	Youth Gender (Female)	−.02	−.06	-----							
4.	Race (White)	−.27***	−.39***	.03	-----						
5.	Rumination, Baseline	−.03	−.02	.08	−.08	-----					
6.	Rumination, 1st Follow-up	.17*	.00	.27***	−.02	.46***	-----				
7.	DIS Overall, Baseline	−.02	−.06	−.14*	.05	.35***	.19**	-----			
8.	DIS Overall, 1st Follow-up	.01	−.03	−.04	.11	.25***	.41***	.52***	-----		
9.	CDI, Baseline	−.10	−.02	.09	−.03	.47***	.34***	.19**	.18**	-----	
10.	CDI, 2nd Follow-up	.19**	.10	.12	−.08	.26***	.42***	.10	.26***	.34***	-----

Single Motherhood is coded (0 = two-parent family, 1 = single-mother family). Low SES = families eligible for subsidized school lunch; DIS = depressogenic inferential style; CDI = Children's Depression Inventory.

* $p < .05$;

** $p < .01$;

*** $p < .001$