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Daily life with depressive symptoms: Gender differences in adolescents' everyday emotional experiences

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ABSTRACT

Depression is a prevalent and debilitating illness facing many adolescents, especially adolescent girls, whose risk for this disorder is approximately twice that of boys. Many studies have identified mechanisms that place girls at higher risk for depression during adolescence. Few, however, have examined differences in the everyday emotional experiences of boys and girls with varying levels of depressive symptoms. Using the Experience Sampling Method, this study investigated the roles of gender and depressive symptomatology in the emotional experiences of a community sample of youth (11–18 year-olds) from the Sloan 500 Family Study. Females with higher levels of depressive symptoms were more likely than females with fewer depressive symptoms and all males to experience strong negative emotions and to attribute the cause of these emotions to other people. These results suggest that emotional reactivity in interpersonal contexts is especially important to understand gender differences in the daily experience of depressive symptoms.

Adolescence is a critical period in the development of depression, with rates of all depressive disorders, including Major Depressive Disorder and Dysthymia, rising sharply around age 13 (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003). Even in the absence of a diagnosed disorder, depressive symptoms such as negative mood, low self-esteem, and anhedonia increase in prevalence during early adolescence (Saluja et al., 2004). The increased rates of both sub-threshold and clinical depressive disorders are especially pronounced in girls, leading to a significant gender difference in early adolescence that continues through adulthood (Angold, Costello, & Worthman, 1998; Angst & Merikangas, 1997; Kessler, 2003; Nolen-Hoeksema, 1994; Nolen-Hoeksema & Girgus, 1994; Petersen, Sarigiani, & Kennedy, 1991).

While a large body of research documents both the overall rise in and emergence of sex differences in depressive symptoms during adolescence, previous work has done little to clarify how male and female youth at varying levels of depressive symptoms experience their everyday emotional lives. The current study expands on past research by using

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momentary diary data to examine how gender and depressive symptoms act independently, and interact, to predict the everyday emotional experiences of adolescents. The goal of this study is to better understand how male and female adolescents with varying levels of depressive symptoms experience their daily affective lives, including levels of negative and positive affect, and the perceived causes of their affective experiences.

Developmental and gender differences in emotion

Adolescence has long been considered a period of "storm and stress," in which there is increased conflict, mood disturbances, and risk-taking. While this conceptualization of the adolescent experience is not necessarily universal (Arnett, 1999), there is evidence to suggest that adolescents experience more emotional intensity and interpersonal conflict compared to children or adults (Smetana, Campione-Barr, & Metzger, 2006; Spear, 2009).

The maturation of affective centers in the brain (e.g., the amygdala) is triggered by the release of gonadal hormones at the onset of puberty (Ahmed et al., 2008; Bramen et al., 2011; Giedd, Castellanos, Rajapakse, Vaituzis, & Rapoport, 1997; McEwen, 2001), leading to a rise in emotional intensity during early adolescence, around the transition to puberty (Dahl & Gunnar, 2009; Hare et al., 2008). However, the maturation of cognitive control systems (e.g., the prefrontal cortex) correlates with age and experience, not sexual maturation, and often lags behind the affective centers in development (Dahl, 2004; Gogtay et al., 2004). This difference in timing suggests that while adolescents are able to experience more intense emotions, they do not necessarily have the cognitive resources to cope effectively with them, especially during stressful situations when their emotional arousal is high (Casey, Jones, & Hare, 2008; Dahl, 2004). This pattern of increased emotional intensity, coupled with the lack of cognitive coping resources, is one theoretical explanation given for the rise in depression rates during adolescence (Davey, Yücel, & Allen, 2008; Nelson, Leibenluft, McClure, & Pine, 2005). While this model does not necessarily capture the complexity of adolescent brain development or emotion, it offers a compelling framework for understanding the development of depression in adolescence (Casey et al., 2010; Dahl & Spielberg, 2014).

The apparent mismatch between affective and cognitive development may lead to difficulty managing strong emotions and navigating social situations in particular (Dahl, 2004; Nelson et al., 2005). In adolescence, there is an increase in emotional reactivity to social stimuli, as well as a stronger focus on friendships outside of the family (Steinberg & Morris, 2001). Those who have strong emotional reactions to social stimuli may be less able to regulate their emotions, plan appropriate responses, or think through their reactions in a calm way, leading to behavioral difficulties and interpersonal conflict. Thus, conflict in interpersonal relationships may be both more common and more impactful for adolescents as compared to children and adults.

These developmental trends in emotional reactivity and sensitivity to interpersonal context may also help to explain the emergence of the gender difference in depression. Studies suggest that adolescent and young adult women experience greater overall emotional intensity than men. Women report higher ratings of both positive and negative emotion (Almeida & Kessler, 1998; Brody & Hall, 2008; Fujita, Diener, & Sandvik, 1991; Hammen & Padesky, 1977). In a meta-analysis examining gender differences in adults' reports of emotions, Brebner (2003) found that women reported higher levels of almost every emotion compared to men, including anger, contentment, joy, sadness, and affection. While this increased emotional intensity may serve as a protective factor (when the balance of emotion is equal or more positive), it could also lead to depressive symptoms, particularly if one experiences more negative emotions than positive emotions.

For adolescent girls, these intense negative emotions might be most likely to occur in social situations. Studies have shown that girls have stronger emotional reactions to interpersonal conflict in lab settings (MacEvoy & Steven, 2012; Whitesell & Harter, 1996) and in everyday life (Rudolph, 2002). In addition, girls tend to be more invested in their friendships and place more value on their social relationships (Rose & Rudolph, 2006). Combined with greater emotional lability more generally, adolescent girls' increased investment in social relationships and their increased reactivity to interpersonal conflict may place them at higher risk for depression. A study by Charbonneau, Mezulis, and Hyde (2009) found that 15-year old girls showed more emotional reactivity to stressful interpersonal events compared to boys, and that high levels of emotional reactivity moderated the relationship between stressful events and depression in adolescents. At lower than average levels of emotional reactivity, there was no relationship between stressful events and depression, but at higher than average levels of emotional reactivity, there was a strong relationship between stress and depression (Charbonneau et al., 2009).

Taken together, this evidence supports a model of depression that incorporates developmental and gender differences in emotional reactivity and interpersonal stress. One such theory is the affective-biological-cognitive (ABC) model of depression, developed by Hyde, Mezulis, and Abramson (2008). This model uses a stress–vulnerability framework to explain the gender difference in depression rates during adolescence. One potential explanation, as posited by this theory, is that girls have an affective vulnerability (namely, negative emotionality), which triggers depressive symptoms when coupled with interpersonal stress. In addition, girls experience more emotional reactivity to stressful events, especially those of an interpersonal nature, which increases their risk of developing depression (Hyde et al., 2008).

Gender differences in the everyday experience of depression

The research above shows that differences in everyday affective experiences for adolescent boys and girls may contribute to differences in their risk for depression. It does not, however, answer the question of whether boys and girls with high depressive symptoms *experience* those symptoms differently in their daily lives. Some studies of adults have found that

depressed men and women show different patterns of symptoms that align with gender differences in emotional intensity and interpersonal conflict. When performing interviews with depressed patients, Danielsson and Johansson (2005) found that women were more likely to talk about their emotional symptoms when asked about their diagnosis, while men were more likely to discuss their physical symptoms. Also, women were more likely to describe feelings of shame or guilt, while men were more likely to relate feelings of aggression and anger. The differences in reported symptoms could reflect how males and females uniquely experience depression. It could also be the result of a reporting bias; women may be more comfortable sharing their emotional experiences, while men may focus on more somatic symptoms when discussing their difficulties (Gross & John, 1995). These studies provide evidence for gender differences in the experience of depression for adults, but may not reflect how depression is experienced in male and female adolescents.

Research has shown there are also gender differences in adolescents' emotional experiences in the context of interpersonal interactions while they are experiencing depression. A study by Shih, Eberhart, Hammen, and Brennan (2006) showed girls experienced higher reactivity to interpersonal life stress compared to boys, and this partially explained the higher prevalence of depression in this group. Girls with depressive symptoms may therefore have stronger emotional reactions to negative interpersonal situations than boys with depressive symptoms.

By examining daily diary reports of thoughts, feelings, and behaviors among adolescent boys and girls, the current study explores how adolescents' daily affective experiences differ between genders and across youth of varying levels of depressive symptoms. This study also investigates how gender and depressive symptoms impact mood in relation to interpersonal experiences. Specifically, this study will examine the independent effects of gender and depressive symptoms on daily emotional experiences, as well as how gender may moderate the relationship between depressive symptoms and mood.

Overall, we predict that depressive symptoms and gender will each independently predict momentary mood states. Given that it is a key feature of the disorder, we expect that higher levels of depressive symptoms will predict higher levels of negative affect and lower levels of positive affect. We also predict gender effects in mood: adolescent girls are hypothesized to report higher levels of both positive and negative affect in their daily diaries compared to adolescent boys, independent of depressive symptoms. We expect similar effects for strong emotions, with girls experiencing strong positive and negative emotions more often than boys, and those with higher depressive symptoms experiencing strong negative emotions more often than those with low depressive symptoms. We also expect gender to moderate the relationship between depressive symptoms and strong emotions, with girls who report high levels of depressive symptoms experiencing higher levels of strong negative emotion than girls with low depressive symptoms and all boys. Regarding strong emotions *because of others*, we predict that gender will moderate the relationship between depressive symptoms and affective experience, such that girls with high depressive symptoms experience higher levels of negative emotion because of other people compared to all other groups. This hypothesis reflects the notion that girls with depressive symptoms are particularly susceptible to negative affectivity and interpersonal stress.

Method

The data for this study were obtained from the Contemporary Families and Experiences of Work Study, funded by the Alfred P. Sloan Foundation (also known as the Sloan 500 Family Study). Data were collected from 1997 to 2001 in eight major urban and suburban communities across the United States (Schneider & Waite, 2005).

Participants

Participants included 353 adolescents aged 11–18 years old, with a mean age of 15.13 years. The Sloan 500 Family Study enrolled adolescents who were part of dual-career families, in which both the mother and father engaged in paid labor outside the home. Fifty-five percent of participants were female, and the majority of participants (80%) were Caucasian. See Table 1 for demographic information.

Procedures

The study involved the Experience Sampling Method (ESM; Larson & Csikszentmihalyi, 1983), in which participants reported their thoughts, feelings, and activities at unanticipated moments throughout the day. Participants took part in ESM data collection for seven consecutive days, during which time they wore wristwatches that beeped eight times throughout the day, or 56 beeps throughout the course of the week-long study. Participants were beeped at different unanticipated intervals (no less than 30 min apart and no more than 2 h apart) from 7:30 am through 10:30 pm each day. When the watch beeped, participants were asked to complete a paper diary entry about what they were doing, who they were with, and what their thoughts and feelings were at that time. In order to be included in the analysis, participants had to complete at least half of the requested diary entries each study day, or an average of four diary entries per day ($n = 55$ excluded), giving us a final analytic sample of $n = 298$. Additionally, all participants were asked to complete a self-report questionnaire that assessed their family life, individual psychological well-being, and functioning in extra-familial contexts, including their school performance and peer relationships. This questionnaire also assessed for demographic characteristics, including race, age, and family income.

Table 1
Demographic characteristics.

	Mean
Demographics	
Age	15.13 (1.68)
Female (%)	56
Race (%)	
Caucasian	81.42
African American	7.43
Hispanic	3.72
Other race	1.01
Income (%)	
$0–$25,000	2.7
$25,001–$50,000	17.4
$50,001–$80,000	17.4
$80,001–$100,000	15.4
$100,001–$150,000	23.2
Over $150,000	20.1

Note. Standard deviations are presented in parentheses.

Measures

Depressive symptoms

The Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977), which was included in the participant questionnaire, was used to evaluate depressive symptoms (19 items; $\alpha = .88$). This measure assesses various depressive symptoms, including depressed mood, absence of well-being, somatic symptoms (e.g. sleep or appetite disturbances), and interpersonal symptoms (e.g. feeling disliked). Participants rated symptoms on a scale of 0 (never) to 3 (often), indicating how often they had experienced each symptom in the past week. One item from this scale ("I had crying spells") has been shown to be disproportionately endorsed by women (Cole, Kawachi, Maller, & Berkman, 2000), so it was omitted from analysis. The total CES-D score was calculated by averaging all of the items and multiplying this average value by 20, resulting in a score ranging from 0 to 60. This has been done in previous studies using the CES-D (e.g., Longmore, Manning, Giordano, & Rudolph, 2004). Field tests conducted by Radloff (1977) verified the validity and reliability of the measure, as well as its generalizability across populations. Further studies (e.g., Sheeber, Davis, Leve, Hops, & Tildesley, 2007) have used the CES-D with adolescents.

Negative and positive mood state

Momentary mood states were measured in the ESM diary. Participants were asked the extent to which they felt happy or sad on a scale from 1 to 7, with the lower end of the scale indicating sadness and the higher end of the scale indicating happiness. Participants were also asked to rate the extent to which they were experiencing several mood states throughout the day on a scale ranging from 0 (not at all) to 3 (very much). A positive affect scale was constructed by standardizing (Mean = 0, SD = 1) and then averaging ratings of positive mood states, including happy, cheerful, proud, relaxed, cooperative, caring, and friendly (7 items; $\alpha = .882$). The happy item was converted from a 1 to 7 scale to a 0 to 3 scale for the purposes of presenting means in Table 2. A negative affect scale was constructed by standardizing and averaging ratings of negative mood states, including angry, nervous, lonely, frustrated, strained, worried, irritated, and stressed (8 items; $\alpha = .911$). Mood state items from the momentary diaries were averaged across day and diary entry before scale construction, to create an aggregate (mean) rating of each mood state item for each individual across all of their diary entries.

Table 2
Descriptive statistics.

	Full sample			Male			Female		
	Mean (SD)	Min	Max	Mean (SD)	Min	Max	Mean (SD)	Min	Max
CES-D score	15.18 (9.59)	0	54.44	14.84 (9.02)	1.11	43.33	15.44 (10.03)	0	54.44
Mood state									
Overall positive	1.28 (.53)	.06	2.96	1.21 (.57)	.06	2.96	1.32 (.49)	.21	2.62
Overall negative	.46 (.32)	0	1.76	.43 (.31)	0	1.65	.48 (.34)	.02	1.76
Strong emotions[a]									
Strong positive emotion	.06 (.10)	0	.51	.04 (.07)	0	.39	.07 (.11)	0	.51
Strong negative emotion	.08 (.11)	0	.54	.06 (.10)	0	.54	.10 (.12)	0	.52
Strong positive due to others	.02 (.03)	0	.21	.01 (.03)	0	.17	.02 (.04)	0	.21
Strong negative due to others	.03 (.04)	0	.24	.02 (.03)	0	.12	.03 (.05)	0	.24

[a] Values represent the proportion of total diary reports.

Strong negative and positive emotion

Emotional experiences were also measured with participant reports of strong emotion. In each diary entry, participants were asked: *If you felt a strong emotion since the last report, what did you feel and why did you feel that way?* These strong emotions were coded as positive (e.g., joy, alertness) or negative (e.g., anger, sadness). A dummy variable was created for a strong positive emotion and a separate dummy variable was created for a strong negative emotion based on these codes. Each dummy variable was averaged across all diary entries, resulting in two variables, between zero and one, representing the proportion of beeps during which each participant was experiencing a strong negative or strong positive emotion during data collection.

The research team also coded participants' open-ended responses explaining the reason for each strong emotion. These codes specified certain people, including family, friends and significant others, as well as outside influences, including general time pressure, as reasons that participants cited for their strong emotion. Two dummy variables were created to specify when participants reported a strong positive/negative emotion that was explicitly caused by another person (e.g., parent, friend, sibling, boyfriend/girlfriend). Using the method described above, we created two distinct variables to capture the proportion of time participants were experiencing (1) a strong positive emotion because of another person or (2) a strong negative emotion because of another person.

Data analysis

Multiple regression analyses were conducted to explore the relationship between gender, depressive symptoms, and daily emotional experiences. For each outcome, two models were run. The first model regressed mood on gender and depressive symptoms. The second model regressed mood on gender, depressive symptoms, and the interaction term for gender and depressive symptoms. Age, race, and income were included as covariates in both models because of their potential to confound the relationship between depressive symptoms and mood, as well as the relationship between gender and mood. Prior research has shown associations between these factors and daily affective experiences (Brondolo et al., 2008; Grzywacz, Almeida, Neupert, & Ettner, 2004; Larson, Moneta, Richards, & Wilson, 2002).

Results

Descriptive data and overall gender and depression differences

Across the entire sample, the average CES-D score was 15.18, with a standard deviation of 9.59. An independent samples *t*-test was conducted comparing CES-D scores between males and females. There were no significant differences in depression by gender (t (1, 296) = 1.33, $p > .05$). The mean CES-D score was 15.44 for girls and 14.85 for boys.

Please see Table 2 for descriptive statistics on all variables.

Mood state

Positive mood state

The two regression models accounted for 8.4% and 8.7% of the variance, respectively ($R^2 = .084$, $F(7,267) = 3.52$, $p < .01$; $R^2 = .087$, $F(8,266) = 3.17$, $p < .01$). In Model 1, higher levels of depressive symptoms were associated with a less positive mood state ($\beta = -.142$, $p < .05$), as was increasing age ($\beta = -.19$, $p < .01$). There was a trend for females to experience higher levels of positive mood state, but this was not statistically significant ($\beta = .11$, $p = .058$). In Model 2, there was no significant interaction effect for gender and depressive symptoms ($\beta = .12$, $p > .05$). See Table 3 for full results.

Table 3
Summary of multiple regression analyses for daily mood state.

	Overall positive mood state		Overall negative mood state	
	Model 1 β (*SE*)	Model 2 β (*SE*)	Model 1 β (*SE*)	Model 2 β (*SE*)
Age	−.19 (.03)**	−.20 (.01)**	.02 (.01)	.02 (.01)
Income	−.01 (.00)	−.00 (.00)	.06 (.00)	.06 (.00)
Race[a]				
African American	−.04 (.17)	−.04 (.17)	−.10 (.07)	−.09 (.07)
Hispanic	−.12 (.23)	−.12 (.23)	−.03 (.10)	−.03 (.10)
Other	−.05 (.51)	−.05 (.51)	.02 (.22)	.02 (.22)
Female	.11 (.09)	.03 (.17)	.05 (.04)	−.00 (.07)
Depressive symptoms	−.14 (.04)*	−.21 (.02)*	.34 (.00)***	.31 (.01)**
Gender × depressive symptoms		.12 (.01)		.07 (.00)

Note: outcome variables are standardized.
*p < .05, **p < .01,***p < .001.
[a] Comparison group is non-Hispanic White.

Negative mood state

Model 1 accounted for 14.2% of the variance ($R^2 = .142$, $F(7, 267) = 6.31$, $p < .001$), and Model 2 accounted for 14.3% of the variance ($R^2 = .143$, $F(8, 266) = 5.55$, $p < .001$) in overall negative mood state. In Model 1, more depressive symptoms predicted a higher negative mood state ($\beta = .34$, $p < .001$). There were no effects for gender in this model ($\beta = .05$, $p > .05$), nor was there an interaction effect in Model 2 ($\beta = .07$, $p > .05$).

Strong emotion

Strong positive emotion

Model 1 accounted for 5.9% of the variance ($R^2 = .059$, $F(7,267) = 2.39$, $p < .05$) and Model 2 accounted for 6.5% of the variance ($R^2 = .065$, $F(8, 266) = 3.32$, $p < .05$) in strong positive emotion. In Model 1, there was a significant effect of gender ($\beta = .21$, $p < .001$), with girls experiencing higher levels of strong positive emotions compared to boys. However, there was no effect of depressive symptoms, nor was there a significant interaction (both *ps* > .05). See Table 4 for results.

Interpersonal reasons for strong positive emotion

Similarly, there was an effect for gender in the proportion of entries participants attributed their strong positive emotions to others ($\beta = .191$, $p < .01$), with girls attributing their strong positive emotions to others more often compared to boys. There was no effect of depressive symptoms and no interaction effect (both *ps* > .05). These models accounted for about 7% of the variance (Model 1: $R^2 = .073$, $F(7,267) = 3.01$, $p > .01$; Model 2: $R^2 = .074$, $F(8,266) = 2.67$, $p < .01$).

Strong negative emotion

The regression analysis accounted for 6.9% of the variance in Model 1 and 8.6% of the variance in Model 2. Gender ($\beta = .17$, $p < .01$) and age ($\beta = .17$, $p < .01$) both significantly predicted the proportion of entries in which participants reported strong negative emotions. Female gender and older age predicted higher levels of strong negative emotion. There was also a trend for depressive symptoms, although this was not significant ($\beta = .11$, $p = .068$). In Model 2, there was a significant interaction effect showing that gender moderated the relationship between depressive symptoms and strong negative emotion ($\beta = .30$, $p < .05$). The effect of depressive symptoms on strong negative emotion was stronger for girls compared to boys, such that girls with high depressive symptoms experienced strong negative emotions more often than girls with low depressive symptoms and all boys (see Fig. 1).

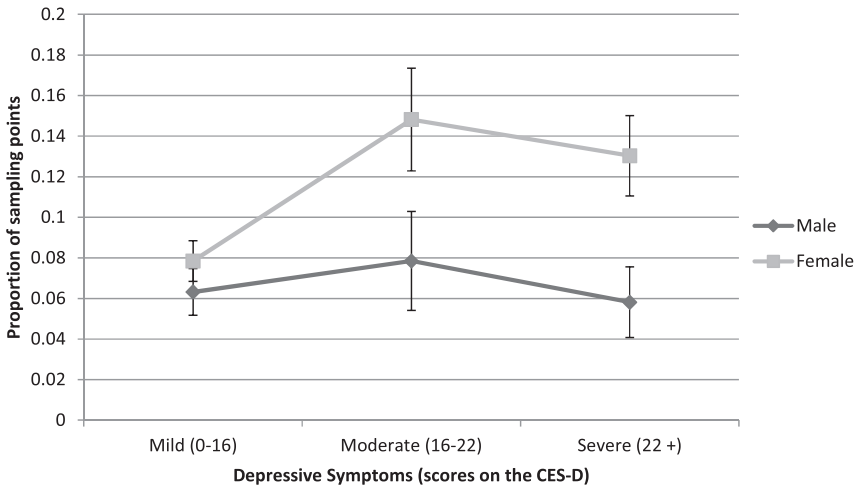
Interpersonal reasons for strong negative emotions

For the proportion of sampling points in which participants felt a strong negative emotion caused by others, the regression models accounted for 10.6% and 13.1% of the variance, respectively ($R^2 = 10.6$, $F(7, 267) = 4.50$, $p < .001$; $R^2 = .131$, $F(8,266) = 4.99$, $p < .001$). In the first model, there were significant positive effects of gender ($\beta = .19$, $p < .01$), such that girls reported strong negative emotions due to others more often than boys. There were also effects for depressive symptoms ($\beta = .18$, $p < .001$), age ($\beta = .12$, $p < .05$), and being Hispanic ($\beta = .14$, $p < .05$). In Model 2, the interaction between gender and depressive symptoms significantly predicted strong negative emotions due to others ($\beta = .37$, $p < .01$). This is, gender moderated the effect of depressive symptoms such that girls with high depressive symptoms experienced strong negative emotions due to others more often than girls with low depressive symptoms and all boys (see Fig. 2). The significant effect of being Hispanic ($\beta = .14$, $p < .05$) remained significant, with Hispanic adolescents experiencing strong negative emotions due to interpersonal reasons more often than non-Hispanic Whites.

Table 4
Summary of multiple regression analyses for strong emotions.

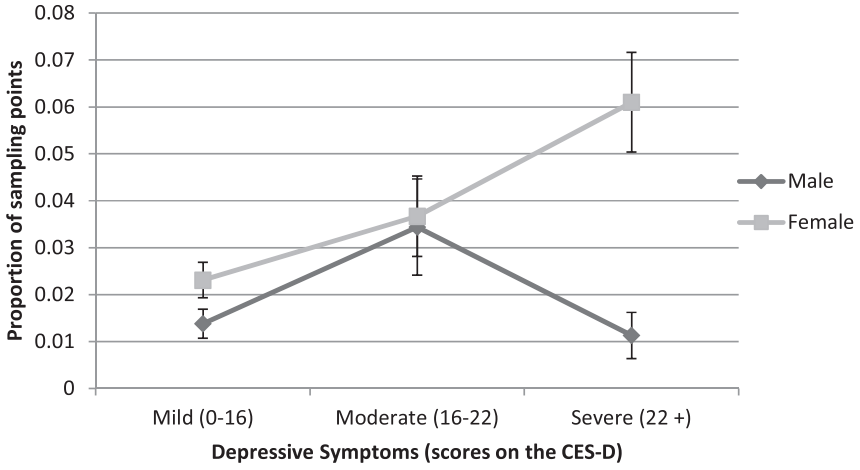
Variable	Strong positive emotion		Strong negative emotion		Strong positive emotion due to others		Strong negative emotion due to others	
	Model 1 β (*SE*)	Model 2 β (*SE*)	Model 1 β (*SE*)	Model 2 β (*SE*)	Model 1 β (*SE*)	Model 2 β (*SE*)	Model 1 β (*SE*)	Model 2 β (*SE*)
Age	.07 (.00)	.07 (.00)	.17 (.00)**	.16 (.00)**	.07 (.00)	.07 (.00)	.12 (.00)*	.10 (.00)
Income	.06 (.00)	.06 (.00)	.03 (.00)	.03 (.00)	.11 (.00)	.11 (.00)	.07 (.00)	.07 (.00)
Race[a]								
African American	−.07 (.02)	−.06 (.02)	−.06 (.03)	−.05 (.03)	−.08 (.01)	−.09 (.01)	.01 (.01)	.02 (.01)
Hispanic	−.07 (.03)	−.07 (.03)	.02 (.04)	.01 (.04)	.00 (.01)	.00 (.01)	.14 (.01)*	.14 (.01)*
Other	−.02 (.07)	−.02 (.07)	.02 (.08)	.02 (.08)	−.04 (.02)	−.04 (.02)	.02 (.03)	.02 (.03)
Female	.21 (.01)***	.08 (.02)	.17 (.01)**	−.04 (.03)	.19 (.00)**	.14 (.01)	.19 (.01)**	−.07 (.01)
Depressive symptoms	.02 (.00)	−.08 (.00)	.11 (.00)	−.06 (.00)	.09 (.00)	.05 (.00)	.18 (.00)**	−.02 (.00)
Gender × depressive symptoms		.18 (.00)		.30 (.00)*		.07 (.00)		.37 (.00)**

*p < .05, **p < .01,***p < .001.
[a] Comparison group is non-Hispanic White.



Note: Error bars represent standard errors

Fig. 1. Proportion of time participants felt a strong negative emotion.



Note: Error bars represent standard errors

Fig. 2. Proportion of time participants felt a strong negative emotion caused by others.

To rule out the possibility that this finding is due to group differences in the amount of time adolescents spend with other people, we ran follow-up analyses. We found that neither gender ($\beta = -.04$, $p > .05$) nor depressive symptoms ($\beta = -.01$, $p > .05$) predicted the proportion of diary entries participants reported being with others. The results of the follow-up analyses suggest that the findings for strong emotions because of others are not accounted for by the amount of time adolescents spend in the company of others.

Discussion

Results from this study indicated that depressive symptoms and gender were each independently related to adolescent emotional experiences, and also interacted in the context of strong negative emotions and strong negative emotions attributed to interpersonal factors. There were many effects for gender and depressive symptoms when reports of strong emotions were examined, and fewer for daily mood state. These results point to the importance of investigating variations in adolescent experience during times of increased emotional intensity. As stated earlier, adolescents experience more emotional intensity, but may not have the cognitive resources to cope with these emotions, especially in interpersonal contexts. Results suggest that this is especially true for adolescent girls and those experiencing depressive symptoms. Furthermore, results suggest that the combination of being female and having depressive symptoms may be especially

associated with the experience of strong negative emotion and strong negative emotion because of others. This outcome provides additional detail at the process level for the ABC model of depression, which posits that depression risk is increased for girls because of their susceptibility to negative affectivity and interpersonal stress, as well as their increased reactivity to interpersonal stress.

One unexpected finding in this study was the lack of a gender difference in depression scores. This could reflect that our sample is not normative with regard to depression rates. The girls in our sample had an average CES-D score of 15.44, while other studies using the CES-D have found means for girls closer to 19 (Avison & McAlpine, 1992). Additionally, our sample is comprised of adolescents from two-parent, middle-income and high-income families. Therefore, overall depression scores, and gender differences in depression, may be lower in this sample compared to more diverse samples (Lorant et al., 2003).

Mood state

There were relatively few effects for daily positive and negative mood states. Overall positive mood was found to decline with age, supporting previous research that daily positive affect decreases across the transition to adolescence (Weinstein, Mermelstein, Hankin, Hedeker, & Flay, 2007). Depressive symptoms also predicted lower overall positive mood and higher negative mood. This is not surprising, given that increased negative mood and decreased positive mood are key features of depression (Watson, Clark, & Carey, 1988).

Strong emotion

There was a main effect for gender on proportion of diary entries in which participants felt a strong emotion. Being female predicted higher levels both of strong negative *and* strong positive emotions. There was also an interaction effect of gender and depressive symptoms, indicating that females with more symptoms experienced higher levels of strong negative emotions. In other words, females reported more strong emotions in general, which is consistent with previous research suggesting that women experience higher emotional intensity than men (Brebner, 2003; Brody & Hall, 2008). For females with increased depressive symptoms, this intensity was particularly manifested as increased reports of strong negative emotion. Whether this strong negative emotion is a cause or a consequence of high depressive symptoms cannot be determined from the current cross-sectional data, but it is noteworthy that the pattern of strong negative emotion was especially salient for females, as compared to male adolescents high in depressive symptoms. However, it is also possible that this finding is related to reporting biases. Females may be more willing to admit when they are experiencing strong emotions compared to males. Previous studies on emotional self-report have suggested that males are less expressive than females when reporting their feelings (Brody & Hall, 2008). However, it may also be the case that the symptom profile for depressed female adolescents is different than males in that it is characterized by greater emotional intensity, particularly of a negative valence.

The proportion of time participants reported strong emotions because of others showed main effects for gender and level of depressive symptoms, as well as an interaction effects. Females were more likely than males to report feeling a strong negative or positive emotion because of others. This finding is supported by previous research highlighting the importance of social relationships for female adolescents (Rose & Rudolph, 2006) and suggests that females' strong emotions are often tied to their interpersonal interactions. However, since these experiences are recorded retrospectively, it is also possible that females are just more likely to remember strong emotional reactions being caused by interpersonal events. That said, the fact that this retrospective reporting occurs within the hour after each event (due to the ESM methods used in this study) makes this recall bias less likely.

There was also a significant effect of depressive symptoms on experiencing strong negative emotions because of other people (but not strong *positive* emotions because of others). Participants with higher levels of depressive symptoms were more likely to attribute the cause of their strong negative emotions to other people. This suggests that adolescents with high levels of depressive symptoms either experience more negative emotion in response to social interactions or view and/or remember their interactions more negatively, therefore feeling more negative emotion as a result. The latter hypothesis is consistent with previous work on the effects of depressed mood on social cognition (Forgas, 2008). It is also possible that depressed adolescents behave more negatively during their interpersonal interactions, leading to frustration among their friends and declining quality in their relationships. This is consistent with previous work on friendship quality and stress generation in depressed adolescents (Prinstein, Borelli, Cheah, Simon, & Aikins, 2005; Rudolph et al., 2000).

Finally, results showed an interaction effect of gender and depressive symptoms in predicting strong negative emotions due to other people. This finding supports the idea that females with high depressive symptoms both experience more interpersonal stress and react more negatively to it, creating more turbulent emotional experiences (Shih et al., 2006). Given the cross-sectional nature of this study, we cannot ascertain whether this emotional experience is a cause or consequence of depressive symptoms for girls. However, this finding is consistent with, and builds on, the hypothesis in the ABC model of depression that girls who develop depressive symptoms are more likely to be highly emotionally reactive to stressful interpersonal events (Hyde et al., 2008). While previous research has underlined the importance of emotional reactivity to major stressful interpersonal events (i.e., specific events that can be self-reported up to a year later) (Charbonneau et al.,

2009), this study suggests that strong negative emotional reactivity to everyday, stressful interpersonal events may also be associated with higher depressive symptoms.

Together, these results suggest that adolescent females may be more sensitive to interpersonal situations. All females were shown to have higher levels of positive emotion while with others and experience more strong positive emotions because of others; therefore girls may derive more enjoyment from their interpersonal experiences compared to boys. This is consistent with previous research stating that girls are more invested in making connections with others and forming close friendships (Rose & Rudolph, 2006). However, as shown above, being interpersonally oriented may also have costs for those girls with high levels of depressive symptoms. For instance, it is plausible that interpersonal events had a greater influence on strong negative emotions among the female adolescents with high levels of depression in our study, compared to females with low depression and all males. The use of ESM methods also allows for the measurement of smaller stressful events. While retrospective self-report measures of stressful experiences can capture intense interpersonal conflict, this "everyday" approach may capture smaller conflicts or slights that are not intense enough to be memorable later on, but have important implications for gender differences in the experience of depression.

Age predicted more frequent reports of strong negative emotion, which aligns with work showing that emotional intensity increases with adolescence (Larson et al., 2002). Being Hispanic also predicted more reports of strong negative emotions due to others. This finding may reflect increased socialization to the family in Hispanic culture. Hispanic adolescents may experience more time with their families or more expectation to engage in family activities (Hardway & Fuligni, 2006). Given that adolescence is characterized by more investment in friendships and less in family (Steinberg & Morris, 2001), this effect may be driven my Hispanic adolescents' conflict with their families. However, this finding should be interpreted with caution, as the proportion of Hispanic adolescents in this study is low (3.72% of the sample).

Limitations and future directions

There were several factors that limited the results of this study. Notably, the sample for this study was not representative of a diverse population. Participants were mostly Caucasian, middle class, and from urban or suburban neighborhoods. Therefore, these results may not be generalizable to other populations, including members of other racial/ethnic or socio-economic backgrounds, or those in rural communities. Additionally, while the daily diaries provide us with valuable insight into the thoughts and feelings of these youth, there are also a number of inherent limitations of self-report measures. For instance, participants may have altered their responses in the diary or questionnaire in order to avoid judgment, leading to inaccurate accounts of their experiences. This limitation is also present in our use of a questionnaire to assess depressive symptoms. This measure provides an idea of each participant's level of depressive symptoms, but did not allow us to ascertain whether participants were suffering from diagnosable depressive disorders.

Despite these limitations, the current study offers important insights and suggestions for future research. We found that depressive symptoms and gender are both relevant to adolescents' everyday emotional experiences. Further, these results point to the importance of examining interpersonal context and emotional intensity in order to understand how daily emotional experiences may be different for adolescent boys and girls.

These findings have implications for how clinicians could treat depression in males and females. For instance, depression treatment may be more beneficial for adolescent females if it focuses on management of strong negative emotions in interpersonal contexts and developing effective responses to conflict with others. However, while gender is important in shaping the emotional experiences of adolescents, depression tends to have similar (negative) effects on functioning for both boys and girls. Thus, all youth with depressive symptoms may benefit from treatments and interventions to promote positive mood, reduce negative emotions, and strengthen interpersonal relationships in their everyday lives.

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