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# Differentiating Interpersonal Correlates of Depressive Symptoms and Social Anxiety in Adolescence: Implications for Models of Comorbidity

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Research on psychosocial correlates of depression and social anxiety often has not accounted for their comorbidity. Differentiating correlates of depression and social anxiety may inform the development of comorbidity models. Building on research linking both disorders to interpersonal dysfunction, this study examined interpersonal correlates of depressive symptoms and social anxiety in nonreferred early adolescent (*M* age = 13.46) girls ($n = 83$), controlling for comorbid symptoms. Although both showed significant bivariate correlations with peer and family variables, partial correlations revealed that social anxiety (controlling for depressive symptoms) was more strongly related to peer variables (e.g., social competence and trust and communication in friendships), whereas depressive symptoms (controlling for social anxiety) were more strongly related to family variables (e.g., lower trust and greater alienation and conflict). Comorbid girls showed heightened peer and family alienation compared to purely dysphoric or anxious girls. Implications for casual models of comorbidity and for understanding poorer outcomes associated with comorbidity and discussed.

Research consistently has shown extensive comorbidity between anxiety and depression (Brady & Kendall, 1992; *Diagnostic and Statistical Manual of Mental Disorders* [4th ed. (*DSM–IV*); American Psychiatric Association, 1994]; Lewinsohn, Zinbarg, Seeley, Lewinsohn, & Sack, 1997; Regier, Burke, & Burke, 1990). Looking specifically at social anxiety, 34.2% of those with social phobia also meet criteria for depression, whereas only 14.5% of nonsocial phobics are depressed (Kessler, Stang, Wittchen, Stein, & Walters, 1999). Comorbidity appears to aggravate the negative impact of depression and anxiety. It is associated with higher symptom severity in both disorders, more depression recurrences, increased academic difficulties, suicide attempts, physical illness, worse overall quality of life (Kessler et al., 1999; Lewinsohn, Rohde, & Seeley, 1995; Rush et al., 2005) and worse treatment outcomes (Ledley et al., 2005; Young, Mufson, & Davies, 2006). The effects of comorbidity seem to go above and beyond its component disorders, and it is unclear why.

Although comorbidity clearly exists, there is no consensus on its origins. Clarification of the mechanisms behind comorbidity is important on both theoretical and practical grounds, as it would guide understanding of psychopathology and inform treatment development. Previous research has examined whether comorbidity is a result of a shared underlying substrate, such as negative affectivity (e.g., negative affectivity; Clark & Watson, 1991), common genetic predispositions (Merikangas, 1990), or inadequate diagnostic criteria (Lilienfeld, Waldman, & Israel, 1994). However, little research has examined the possible role of psychosocial factors, which could potentially contribute to comorbidity in two ways. First, shared risk factors may lead to the development of both depression and anxiety. For

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example, Hankin, Abramson, Miller, and Haeffel (2004) showed that negative life events longitudinally predicted depression and anxiety, suggesting that both disorders may be traced to a common cause. Some evidence suggests, however, that different types of stressors predict depression and anxiety. For example, Finlay-Jones and Brown (1981) found that loss-related stressors predict depression, whereas danger-related events predict anxiety. Further exploration of the specificity of psychosocial risk factors to anxiety versus depression may guide the development of more detailed models.

Second, depression-anxiety comorbidity may result from an etiological relationship between the two disorders, in which symptoms of one disorder predispose toward the development of symptoms of the other. Several researchers have observed that anxiety tends to temporally precede depression (Essau, 2003; Orvaschel, Lewinsohn, & Seeley, 1995; Wittchen, Kessler, Pfister, & Lieb, 2000). In contrast, there are few cases in which depression precedes first-onset anxiety, and pure depression (i.e., without a history of anxiety) is relatively rare (Dobson, Cheung, Maser, & Cloninger, 1990). Given its frequent temporal antecedence, some researchers (Stein et al., 2001; Wittchen, Beesdo, Bittner, & Goodwin, 2003; Wittchen et al., 2000) have concluded that anxiety is likely to serve as a risk factor for the later development of depression. This does not exclude the possibility that depression also serves as a risk factor for anxiety, as there may be a reciprocal relationship between the two. In either case, one way in which one disorder could cause the development of the other is by causing the person to behave in ways that increase his or her exposure to etiological stressors. Once again, the identification of specific risk factors, concomitants, and consequences of depression and anxiety may allow for the development of a more informative model of comorbidity.

Further development of both these models demands a clearer understanding of variables specifically associated with depression and anxiety. Although our study does not explicitly test comorbidity models, it lays the groundwork for their development by determining which correlates are related to both depressive symptoms and social anxiety (''shared'' correlates) and which are related to symptoms of one disorder but not the other (''unique'' correlates). We focus on one area that may be particularly pertinent to the development of comorbidity models, and one rarely explored: interpersonal functioning.

Both anxiety and depression have strong interpersonal components that could potentially be related to comorbidity. Although several forms of anxiety have been linked to interpersonal deficits (Hale, Engels, & Meeus, 2006; Storch & Masia-Warner, 2004), social anxiety, being interpersonal in nature, may have a particularly strong potential to interfere with interpersonal relationships. As social anxiety is also one of the most prevalent anxiety disorders in both adolescence and adulthood (Lewinsohn, Hops, Roberts, & Seeley, 1993) and shows a strong temporal precedence to depression (Essau, 2003), it may be especially likely to lead to depression via interpersonal mechanisms. In fact, one study has already shown support for the role of interpersonal factors as mediators in the longitudinal relationship between depression and social anxiety (Grant, Beck, Farrow, & Davila, in press).

There are several ways in which social anxiety can be disruptive to one's interpersonal environment. First, it may impede or restrict the development of close relationships. People with social phobia have fewer friends and romantic relationships and are less likely to marry, and the relationships they manage to build tend to be of lower quality (Alden & Taylor, 2004; Filsinger & Wilson, 1983; La Greca & Lopez, 1998; Sanderson, DiNardo, Rapee, & Barlow, 1990). The scarcity of intimate relationships among people with social anxiety may stem from a number of sources, including avoidance of anxiety-provoking situations or deficits in social skills necessary to develop such relationships. Socially anxious people also tend to display anxiety-related behaviors that elicit negative reactions from others (for a review see Alden & Taylor, 2004; Fydrich, Chambless, Perry, Buergener, & Beazley, 1998; Spence, Donovan, & Brechman-Toussaint, 1999). In absence of fulfilling relationships, socially anxious people may feel lonely or rejected and may lack social support, which may spur dysphoria.

In addition to preventing the development of relationships, social anxiety may be destructive to existing close relationships. We have limited knowledge about how people with social anxiety behave in close relationships, but the available evidence suggests that they display behaviors associated with higher relationship distress. Davila and Beck (2002) found an association between social anxiety and a variety of interpersonal styles in close relationships, including lack of assertion, avoidance of expressing emotion, and overreliance on others, each of which was in turn associated with heightened interpersonal chronic stress. Social anxiety has also been associated with negative communication patterns in romantic relationships (Wenzel, Graff-Dolezal, Macho, & Brendle, 2005), and with retrospectively reported negative perceptions of parents (Arrindell, Emmelkamp, Monsma, & Brilman, 1983; Bruch & Heimberg, 1994).

A more extensive literature links depression to many different forms of interpersonal dysfunction. Depression has been tied to interpersonal rejection (Segrin & Dillard, 1992), and evidence points to specific interpersonal behaviors displayed by depressed individuals, such as excessive reassurance seeking, that account for their

greater likelihood of being rejected (Joiner, Metalsky, Katz, & Beach, 1999). Depression also shows a robust association with romantic dysfunction (Davila, Karney, Hall, & Bradbury, 2003), and in early adolescence, romantic involvement is itself related to depressive symptoms (Davila, Steinberg, Kachadourian, Cobb, & Fincham, 2004; Joyner & Udry, 2000). Depression has also been associated with negative aspects of nonromantic relationships, including attachment insecurity with peers and parents (Armsden, McCauley, Greenberg, & Burke, 1990), family dysfunction (Sheeber, Hops, Alpert, Davis, & Andrews, 1997), and negative friendship qualities (La Greca & Harrison, 2005). Many forms of interpersonal dysfunction have been cited as both causes and consequences, with interpersonal problems predicting increases in depression and depression reciprocally predicting increases in interpersonal problems (Davila et al., 2003).

Although research has clearly demonstrated that both social anxiety and depression are related to difficulties with interpersonal relationships, the vast majority of this research (with some exceptions; e.g., Barrera & Garrison-Jones, 1992; Borelli & Prinstein, 2006; Johnson, Inderbitzen-Nolan, & Schapman, 2005; Stangier, Esser, Leber, Risch, & Heidenreich, 2006) has failed to take into account their extensive comorbidity. Because social anxiety and depression covary, it is unclear which interpersonal factors uniquely relate to depression, which uniquely relate to social anxiety, and which are associated with both disorders. In other words, we cannot really know what variables are specifically associated with social anxiety without controlling for the effects of depressive symptoms, and vice versa. One study (Johnson et al., 2005) found that associations between social anxiety and negative family perceptions were substantially reduced when controlling for depression, demonstrating the importance of examining each variable independently. Clarification of this is important on theoretical grounds, particularly for the development of causal models of depression–social anxiety comorbidity. Furthermore, if social anxiety and depression have different correlates, it may shed light on how they develop uniquely as well as in concert.

There also is little research on how individuals with comorbid disorders differ in their interpersonal functioning from those with ''pure'' (noncomorbid) disorders. Given that comorbid individuals show higher symptomatology and greater impairment, it would not be surprising if they also show greater difficulties in some aspects of interpersonal relationships. One study showed that men (but not women) respond more negatively to a videotape of a depressed–anxious woman, compared to a purely depressed woman, suggesting that comorbid individuals are at greater risk for rejection or isolation (Pettit, Paukert, & Joiner, 2005). Longitudinal evidence also shows that women with comorbid depression generate more interpersonal stress than purely depressed women (Daley, Hammen, Burge, & Davila, 1997). If so, it may partially account for the worse outcomes associated with comorbidity, as relationship difficulties may interfere with treatment efforts, exacerbate symptoms, and lead to impairment in other areas.

Our study tests two related questions using a sample of early adolescent girls. First, in an exploratory fashion, we examined the unique associations of depressive symptoms and social anxiety with several interpersonal variables. These included aspects of relationships with peers and family members, such as interpersonal competence; reports of trust, communication, and alienation; conflict styles; relationship stress; and loneliness. Because previous research has shown that depression and social anxiety have similar correlates, we had no empirical or theoretical basis to predict which specific correlates would be associated with which symptoms. Second, we compared girls with comorbid symptoms to girls with ''pure'' depressive symptoms or social anxiety on these same variables. In line with prior research, we predicted that comorbid girls would show the greatest degree of impairment.

Adolescence is a well-suited age to explore relations between interpersonal functioning, depressive symptoms, and social anxiety. Anxiety disorders tend to have onsets in childhood or early adolescence (Kessler, Berglund, Demler, Jin, & Walters, 2005). Depression rates, considerably lower in childhood, begin to spike during midadolescence (Lewinsohn et al., 1993). Thus, many early adolescents who have already developed anxiety are becoming increasingly vulnerable to first-onset depression. Adolescence also brings a range of interpersonal challenges. Family relationships maintain a central role, but as adolescents gain autonomy, peer relationships become increasingly important (Furman & Buhrmester, 1992). Middle school and high school social atmospheres leave many adolescents vulnerable to rejection, peer relational aggression, and loneliness (Prinstein, Boergers, & Vernberg, 2001). Family conflict also peaks in early adolescence (Laursen, Coy, & Collins, 1998), as parents and teens negotiate increased responsibilities and freedoms. Both social anxiety and depression could potentially interfere with these normative processes, heightening the stress associated with them.

Girls are particularly vulnerable to the development of depression during adolescence. Although prepubescent boys and girls show relatively equal rates of depression, in adolescence girls become depressed substantially more frequently. By age 15 girls are 2 to 3 times more likely to become depressed than boys, a rate that persists into adulthood (Gotlib & Hammen, 1992;

Nolen-Hoeksema & Girgus, 1994). In addition, social anxiety is considerably more common in girls during both childhood and adolescence (Compton, Nelson, & March, 2000). Because girls are more vulnerable to anxiety and depression, a sample of adolescent girls should provide a more powerful analysis.

## METHOD

### Participants

Eighty-three 7th- and 8th-grade girls participated with their primary caregiver. Girls were recruited from a pool of participants in a larger questionnaire study (female $n = 173$), in which participants were drawn from the seventh and eighth grades in three socioeconomically diverse school districts in Suffolk County, New York. Parents of all female questionnaire study participants were contacted to participate in our study, and of these, 80 were scheduled and 65 participated. To recruit additional participants, a recruitment flyer with study information was included with a monthly school newsletter in one district. Twenty-three families responded to this flyer, and 18 participated.[1] The Stony Brook University Committee on Research Involving Human Subjects approved this study. This study was part of a larger project on relationships and adolescent psychological functioning. Data from this project are included in a number of other papers that are currently under review for publication (including Steinberg & Davila, in press, which focuses on the role of parental factors as moderators of the associations between romantic functioning and depressive symptoms, and Yoneda & Davila, 2007, which focuses on associations between same- and other-sex attractions and well-being).

Mean age of the girls was 13.46 ($SD = .67$). Ethnicity and family income level were representative of the school districts, with the majority (89%) being Caucasian. Our sample was representative of the school districts in terms of household income (*New York Times*, 2006) and ethnicity ("School Districts in Suffolk County," 2006). Severe learning disabilities that may have interfered with questionnaire comprehension was an exclusion criterion, but no girls met this criterion.

[1]To ensure that an adequate number of girls with depressive symptoms would participate, parents of girls with higher (22+) questionnaire study Center for Epidemiological Studies-Depression Scale (CES–D) scores were contacted first; however, ultimately all parents of female questionnaire participants were contacted. There were no significant differences between girls recruited from the questionnaire study and from the school newsletter on social anxiety, interview assessed depression, or sociodemographic variables such as family income or ethnicity. There were significant differences between groups on CES–D scores, with girls recruited from the questionnaire study reporting more depressive symptoms ($M = 14.08$, $SD = 12.48$) than girls recruited from the newsletter ($M = 8.11$, $SD = 6.80$), $t(51.91) = 2.67$, $p < .05$, most likely because we prioritized recruitment of questionnaire study girls with higher CES-D scores.

### Procedure

Participants came to the laboratory for two data collection sessions. During the first, parents and adolescents provided consent and assent, respectively, for participation, a clinical interview was administered to assess adolescent symptoms, and parents were interviewed about chronic stress in the parent–child relationship. During the second session, participants completed a battery of questionnaires measuring depressive and anxiety symptoms, interpersonal styles, and variables relating to relationships with friends and family. Participating girls and their parents were each paid $35 at their first session and $40 at their second session.

### Measures

*Psychological symptoms.* Symptoms of depression and social anxiety were assessed using both a clinical interview and self-report questionnaires. Adolescents were interviewed about symptoms of Axis I disorders and were assessed using the Schedule for Affective Disorders and Schizophrenia for School Age Children–Present and Lifetime Version (K–SADS–PL; Kaufman, Birmaher, Brent, & Rao, 1997), a semistructured interview frequently used in research. The K–SADS–PL generates *DSM–IV* (American Psychiatric Association, 1994) diagnoses. In addition, interviewers assessed whether subthreshold symptoms were present using a 4-point scale for each disorder, ranging 0 (*no symptoms*) to 1 (*mild symptoms*) to 2 (*moderate, subthreshold symptoms*), to 3 (*DSM–IV criteria met*). Strong psychometric properties, including concurrent validity and test–retest reliability, have been demonstrated for the K–SADS–PL using child and adolescent samples (Kaufman et al., 1997). For our study, 25% of K–SADS–PL interviews were rated by a second coder. Intraclass correlation for this scale was .82 ($\alpha = .90$) for major depression, and .68 ($\alpha = .80$) for social phobia.

Social anxiety was also assessed with a self-report inventory, the Social Anxiety Scale for Adolescents (SAS–A; La Greca & Lopez, 1998). The SAS–A includes 18 items tapping subjective features of social anxiety, including fear of negative evaluation, interpersonal distress, and social avoidance. Previous research has demonstrated good psychometric properties for the SAS–A, including strong convergent and discriminant validity and internal consistency in adolescent samples (Inderbitzen-Nolan & Walters, 2000; La Greca & Lopez, 1998). In our sample, Cronbach's alpha was .94. Symptoms of depression were also assessed with the Center

for Epidemiological Studies-Depression Scale (CES–D; Radloff, 1977), a commonly used self-report inventory. The CES–D was specifically designed for use with community samples and includes 20 items assessing aspects of depressive symptomatology. Construct validity and internal reliability of the CES–D have been strongly supported, and psychometric properties have been replicated in adolescent samples (Radloff, 1977; Roberts, Andrews, Lewinsohn, & Hops, 1990). Internal reliability in this sample was .77.

*Parental and peer relationship qualities.* Qualities of relationships with parents and peers were assessed using the Inventory of Parent and Peer Attachment (Armsden & Greenberg, 1987), which includes three subscales: Communication, Trust, and Alienation. The Inventory of Parent and Peer Attachment has shown strong convergent validity in adolescent samples (Armsden & Greenberg, 1987). In this study, reliabilities for peers (Cronbach's alphas) were .84 for Trust, .84 for Communication, and .69 for Alienation. For parents, alphas were .67, .58, and .87 respectively. Given the low alpha for Parent Communication, results using this subscale should be interpreted with caution.

*Peer-specific variables.* We assessed self-perceived competence in peer-related functioning using several measures. The Interpersonal Competence Questionnaire (ICQ; Buhrmester, Furman, Wittenberg, & Reis, 1988) is a 40-item self-report measure assessing self-perceived competence in conflict management, relationship initiation, self-disclosure, self assertion, and emotional support. The ICQ has shown good convergent and divergent validity and internal consistency (Buhrmester et al., 1988) and has been adapted for and validated using adolescent samples (Buhrmester, 1990). Each of these areas was rated for both same-sex friends and romantic partners (or, if the participant had no romantic partner, opposite-sex friends). We computed total ICQ score by averaging scores for all areas for both same- and opposite-sex relationships. We chose to aggregate same- and opposite-sex ICQ scores because examining scales separately produced similar results, with identical patterns of significance. Cronbach's alpha for this scale was .96.

The Self-Perception Profile for Adolescents is a self-report measure assessing several domains of self-perceived ability (Harter, 1988). The Self-Perception Profile for Adolescents has demonstrated good internal consistency as well as construct, convergent, divergent, and factorial validity in adolescent samples (Harter, 1988; Wichstrom, 1995). We used the Social Competence and Close Friendship scales, which we averaged to compute a composite peer-related Social Competence scale. Cronbach's alpha for this scale was .88.

The Measure of Adolescent Heterosocial Competence (Grover, Nangle, & Zeff, 2005) assesses competence in romantic situations and other types of interactions with opposite sex peers.[2] The Measure of Adolescent Heterosocial Competence lists 40 heterosocial situations and asks participants to choose one of four multiple-choice responses that best describes how they would respond. The measure has shown adequate internal consistency and discriminant and convergent validity in adolescent samples (Grover et al., 2005) and in our study has a Cronbach's alpha of .67. We assessed participants' number of friends by asking them to list all of their friends' first names and then to specify each friend's gender and whether he or she was a close friend. We then counted the number of people listed in each category, yielding a total number of female, male, and close friends.

We assessed loneliness using the UCLA Loneliness Scale (Russell, 1996), a 10-item self-report scale that has demonstrated convergent and construct validity and internal and test–retest reliability across age groups (Russell, 1996). Cronbach's alpha for this scale was .86.

*Family-specific variables.* We assessed adolescents' perceptions of conflict with each parent using two measures. The Ineffective Arguing Inventory (Kurdeck, 1994) is an eight-item self-report measure assessing the adolescent's view of how she and her parent handle conflicts in their relationship. The Conflict Resolution Styles Inventory (Kurdeck, 1994) measures the degree to which the adolescent relies on negative conflict strategies (e.g., withdrawal, conflict engagements, compliance, and lack of problem solving) during conflict with parents. These measures were originally developed for use with couples, for which they have demonstrated strong stability, convergent and predictive validity, and internal consistency (Kurdeck, 1994). Measures were adapted to assess parent–child conflict, as has been done in previous studies (Hoyt, Fincham, McCullough, Maio, & Davila, 2005). Participants completed each of these scales for both their mother and their father. Because these scales were highly correlated, they were converted to $Z$-scores and summed to create a composite conflict score for both mother ($\alpha = .88$) and father ($\alpha = .91$).

Subjectively reported chronic stress in the parent–adolescent relationship was rated by the participant's primary caregiver. The parent was asked to describe his or her relationship with the adolescent in the past 6 months, focusing on issues of trust, communication,

[2]Note that to some degree both the ICQ and Measure of Adolescent Heterosocial Competence assume heterosexuality. In this sample, the vast majority of participants reported only experiencing opposite-sex sexual attraction (for a more thorough discussion, see Yoneda & Davila, 2007), so we do not believe that this limitation of the two measures substantially affected results.

TABLE 1
Bivariate Correlations Among Symptom Measures

| *Measure* | *Depression (CES–D)* | *Depression (K–SADS)* | *Social Anxiety (SAS–A)* | *Social Anxiety (K–SADS)* |
|---|---|---|---|---|
| Depression (CES–D) | — | | | |
| Depression (K–SADS) | .68** | — | | |
| Social Anxiety (SAS–A) | .59** | .33** | — | |
| Social Anxiety (K–SADS) | .25* | .15 | .35** | — |
| *M* | 12.77 | .43 | 43.48 | .51 |
| *SD* | 11.71 | .80 | 16.52 | .85 |

*Notes.* *N* ranges from 81 to 83. CES–D = Center for Epidemiological Studies–Depression scale (Radloff, 1991); K–SADS = Schedule for Affective Disorders and Schizophrenia for School Age Children—Present and Lifetime Version (Kaufman et al., 1997); SAS–A = Social Anxiety Scale for Adolescents (La Greca & Lopez, 1998).
$^{*}p < .05$. $^{**}p < .01$.

closeness, and conflict. The parent was then asked to subjectively rate, on a 9-point scale (higher ratings indicated greater stress), the amount of stress he or she experienced over the past 6 months with regard to the parent–adolescent relationship.

## RESULTS

Correlations between the symptom measures and means and standard deviations are presented in Table 1. For the K-SADS-PL current depression, 62 girls were rated as zero, 9 girls as one, 10 girls as two, and 2 girls as three. For social phobia, 56 girls were rated as zero, 16 girls as one, 7 girls as two, and 4 girls as three. As expected, there was a significant positive correlation between depressive symptoms and social anxiety using the self-report measures. Surprisingly, interview-based depressive symptoms and social anxiety were not significantly correlated; this may be because of the restricted range for the interview data or to the inclusion of

TABLE 2
Bivariate Correlations Among Depressive Symptoms, Social Anxiety, and Interpersonal Variables

| *Variable* | *Dep Sx (CES–D)* | *Dep Sx (K–SADS)* | *Soc Anx Sx (SAS–A)* | *Soc Anx Sx (K–SADS)* | *M (SD)* |
|---|---|---|---|---|---|
| Peer-Related Variables | | | | | |
| ICQ | –.20† | –.08 | –.38** | –.21†† | 3.63 (.55) |
| SPPA–Peer | –.32** | –.09 | –.53** | –.26* | 3.45 (.58) |
| MAHC | –.25* | –.15 | –.27* | –.14 | 101.94 (9.52) |
| No. Close Friends | .12 | .10 | –.14 | –.09 | 7.22 ( 4.01) |
| No. Male Friends | .22* | .19 | .00 | .00 | 5.31 (3.62) |
| No. Female Friends | –.30** | –.25* | –.26* | .04 | 10.61 (3.73) |
| Peer Communication | –.11 | .04 | –.39** | –.12 | 32.72 (5.40) |
| Peer Trust | –.35** | –.02 | –.52** | –.14 | 41.49 (5.53) |
| Peer Alienation | .53** | .34** | .46** | .24* | 13.76 (4.59) |
| Loneliness | .56** | .32** | .64** | .28* | 17.13 (5.21) |
| Family-Related Variables | | | | | |
| Conflict—Mother | .50** | .32** | .33** | .20† | 0.00 (1.82)[a] |
| Conflict—Father | .46** | .40** | .33** | .29** | 0.00 (1.82)[a] |
| Parent Communication | –.05 | –.16 | –.07 | –.21* | 33.18 (4.96) |
| Parent Trust | –.40** | –.22* | –.26* | –.31** | 37.22 (5.20) |
| Parent Alienation | .71** | .55** | .48** | .27* | 16.10 (6.65) |
| Parent–Child Chronic Stress | .20 + | .31** | .00 | .12 | 3.66 (2.16) |

*Note*: *N* ranges from 76 to 83.; Communication, Trust, and Alienation scales from Inventory of Parent and Peer Attachment (Armsden & Greenberg, 1987). Dep Sx = depressive symptoms; Soc Anx Sx = social anxiety; CES–D = Center for Epidemiological Studies–Depression scale (Radloff, 1991); K–SADS = Schedule for Affective Disorders and Schizophrenia for School Age Children—Present and Lifetime Version (Kaufman et al., 1997); ICQ = Interpersonal Competence Questionnaire (Buhrmester, Furman, Wittenberg, & Reis, 1988); SPPA = Self-Perception Profile for Adolescents (Harter, 1988); MAHC = Measure of Adolescent Heterosocial Competence (Grover, Nangle, & Zeff, 2004); Loneliness = UCLA Loneliness Scale (Russell, 1996). Conflict variables are composite variables including Inventory of Ineffective Arguing and Conflict Resolution Styles Inventory (Kurdek, 1994).
[a] Parental conflict composite variables are *Z*-transformed ($M = 0.00$, $SD = 1.82$).
$^{*}p < .05$. $^{**}p < .01$. $^{\dagger}p < .09$. $^{\dagger\dagger}p = .06$.

situational-specific social phobia (e.g., public speaking) in the clinical interview ratings.

Correlations between the interpersonal variables and symptom measures are presented in Table 2. As shown, symptoms of depression and social anxiety were significantly related to a broad range of peer and family variables, with greater symptoms associated with poorer functioning. Note that although for the most part the self-report and interview data followed the same general pattern of correlations in terms of direction, correlations with self-reported symptoms generally showed greater magnitude, perhaps again the result of restricted range for the interview data.

To determine the unique associations of interpersonal variables with depressive and social anxiety symptoms, we computed partial correlations with depressive symptoms, controlling for social anxiety, and with social anxiety controlling for depressive symptoms. CES–D symptoms were controlled for SAS–A symptoms (and vice versa), and K–SADS depressive symptoms were controlled for K–SADS social anxiety (and vice versa). The especially high correlation between the SAS–A and both self-reported and interview-based depressive symptoms may indicate that the SAS–A taps aspects of depression. Partialing out depressive symptoms should provide a purer measure of social anxiety. These data are presented in Table 3. Looking first at peer variables, we found a significant relationship between SAS–A symptoms and several components of peer dysfunction, including reporting fewer close friends, lower interpersonal competence, lower trust in friends, lower communication with friends, marginally greater alienation with friends, and greater loneliness. Out of concern that these associations may be a result of content overlap between the SAS–A and peer-related variables, we removed three SAS–A items that specifically refer to difficulties with peers (''I feel that peers talk about me behind my back,'' ''I get nervous when I talk to peers I don't know very well,'' and ''I feel shy even with peers I know very well'') and reanalyzed data. Results showed no substantial changes. K–SADS social anxiety showed similar relations to peer-related variables, although lower magnitude.

Controlling for SAS–A symptoms, CES–D symptoms were significantly associated with friend alienation and loneliness. Unlike social anxiety, however, self-reported depressive symptoms were associated with a greater number of close friends, as well as more male friends. CES–D symptoms were not significantly related to any of the other peer variables. K–SADS symptoms showed similar patterns of partial correlations, although generally lower magnitude, with the exception that K–SADS depressive symptoms were significantly associated with

TABLE 3
Partial Correlations Between Depressive Symptoms, Social Anxiety, and Interpersonal Variables

| | *Depressive Sx Controlling for Social Anxiety* | | *Social Anxiety Controlling for Depressive Sx* | |
|---|---|---|---|---|
| *Variable* | *CES–D* | *K–SADS* | *SAS–A* | *K–SADS* |
| Peer-Related Variables | | | | |
| ICQ | .03 | –.05 | –.33** | –.20† |
| SPPA–Peer | –.01 | –.06 | –.45** | –.25* |
| MAHC | –.12 | –.13 | –.15 | –.12 |
| No. Close Friends | .26* | .11 | –.27* | –.10 |
| No. Male Friends | .28* | .19† | –.17 | –.03 |
| No. Female Friends | –.18 | –.26* | –.11 | .08 |
| Peer Communication | .17 | .06 | –.41** | –.13 |
| Peer Trust | –.07 | .00 | –.41** | –.14 |
| Peer Alienation | .37** | .31** | .22†† | .20† |
| Loneliness | .29** | .29** | .46** | .25* |
| Family-Related Variables | | | | |
| Conflict—Mother | .40** | .16 | .05 | .16 |
| Conflict—Father | .35** | .38** | .08 | .26* |
| Parent Communication | –.02 | –.13 | –.05 | –.20* |
| Parent Trust | –.32** | –.19 | –.03 | –.29* |
| Parent Alienation | .60** | .54** | .10 | .23* |
| Parent–Child Chronic Stress | .25* | .30** | –.15 | .08 |

*Note*: *N* ranges from 76 to 83. Communication, Trust, and Alienation scales are from the Inventory of Parent and Peer Attachment (Armsden & Greenberg, 1987). Conflict variables are composite variables including Inventory of Ineffective Arguing and Conflict Resolution Styles Inventory (Kurdek, 1994). K–SADS depressive symptoms were controlled for K-SADS social anxiety and vice versa; CES–D symptoms were controlled for SAS–A symptoms and vice versa. CES–D = Center for Epidemiological Studies-Depression scale (Radloff, 1991); K–SADS = Schedule for Affective Disorders and Schizophrenia for School Age Children—Present and Lifetime Version (Kaufman et al., 1997); ICQ = Interpersonal Competence Questionnaire (Buhrmester, Furman, Wittenberg, & Reis, 1988); SPPA = Self-Perception Profile for Adolescents (Harter, 1988); MAHC = Measure Measure of Adolescent Heterosocial Competence (Grover, Nangle, & Zeff, 2004); Loneliness = UCLA Loneliness Scale (Russell, 1996).

*$p < .05$. **$p < .01$. †$p < .09$. ††$p = .06$.

TABLE 4
Anxiety, Depression, and Comorbid Groups Compared on Interpersonal Variables

| *Variable* | *No Sx*[a] *M (SD)* | *Dep Sx Only*[b] *M (SD)* | *Soc Anx Sx*[c] *Only M (SD)* | *Comorbid Sx*[d] *M (SD)* |
|---|---|---|---|---|
| Peer-Related Variables | | | | |
| ICQ | 3.62 (.62) | 3.67 (.55) | 3.54 (.54) | 3.61 (.53) |
| SPPA–Peer | 3.62 (.41) | 3.48 (.61) | 3.39 (.59) | 3.31 (.63) |
| MAHC | 102.93 (8.45) | 101.88 (10.16) | 100.73 (10.59) | 101.96 (9.93) |
| No. Close Friends | 8.40 (3.33) | 7.67 (4.44) | 4.90 (4.35) | 6.92 (3.31) |
| No. Male Friends | 4.93 (3.24) | 5.27 (3.89) | 3.91 (3.27) | 6.25 (3.54) |
| No. Female Friends* | 12.80 (3.00) | 7.67 (4.44) | 12.27 (3.82) | 9.21 (4.01) |
| Peer Communication | 32.80 (5.09) | 32.69 (5.96) | 30.30 (4.88) | 33.82 (4.94) |
| Peer Trust | 41.60 (5.72) | 42.03 (5.53) | 41.00 (6.25) | 40.86 (5.35) |
| Peer Alienation* | 12.13 (3.02) | 13.00 (5.08) | 13.09 (4.16) | 16.08 (4.25) |
| Loneliness | 15.13 (3.96) | 16.34 (5.54) | 17.81 (3.56) | 19.13 (5.62) |
| Family-Related Variables | | | | |
| Conflict—Mother[e] | −.46(1.15) | .03 (1.96) | −.40 (1.25) | .43 (2.14) |
| Conflict—Father[e] | −.71 (.99) | −.11 (1.83) | −.27 (1.44) | .78 (2.16) |
| Parent Communication | 33.53 (3.62) | 32.53 (3.62) | 30.00 (6.62) | 32.63 (5.72) |
| Parent Trust | 39.00 (3.21) | 38.22 (4.12) | 36.18 (5.33) | 35.33 (6.07) |
| Parent Alienation* | 13.00 (3.61) | 14.76 (7.17) | 14.40 (4.53) | 20.58 (6.10) |
| Parent–Child Chronic Stress | 3.07 (1.62) | 3.39 (2.22) | 3.86 (1.90) | 4.29 (2.42) |

*Note*: *N* ranges from 76 to 83. Communication, Trust, and Alienation scales are from the Inventory of Parent and Peer Attachment (Armsden & Greenberg, 1987). Conflict variables are composite variables including Inventory of Ineffective Arguing and Conflict Resolution Styles Inventory (Kurdek, 1994). CES–D = Center for Epidemiological Studies-Depression scale (Radloff, 1991); K–SADS = Schedule for Affective Disorders and Schizophrenia for School Age Children—Present and Lifetime Version (Kaufman et al., 1997); ICQ = Interpersonal Competence Questionnaire (Buhrmester, Furman, Wittenberg, & Reis, 1988); SPPA = Self-Perception Profile for Adolescents (Harter, 1988); MAHC = Measure of Adolescent Heterosocial Competence (Grover, Nangle, & Zeff, 2004); Loneliness = UCLA Loneliness Scale (Russell, 1996).

[a] $n = 15$. [b] $n = 33$. [c] $n = 11$. [d] $n = 24$. [e] Parental conflict composite variables are *Z*-transformed.

*Significant differences between groups, $p < .05$.

having fewer female friends. In contrast, depressive symptoms (both self-reported and interview assessed) were significantly related to several aspects of family dysfunction when controlling for social anxiety, including greater parent-reported subjective chronic stress, greater conflict with parents, greater parental alienation, and lower parental trust. When controlling for depressive symptoms, none of the associations between self-reported social anxiety and family variables remained. However, interview-assessed social anxiety was significantly associated with more father–child conflict, less parental communication and trust, and greater parental alienation.

To examine the relationship between comorbidity and interpersonal dysfunction, we used K–SADS–PL data to divide participants into four groups according to lifetime comorbidity status. Girls with a lifetime history of depressive symptoms (K–SADS–PL major depression rating $\geq 1$) but no history of social anxiety symptoms were categorized as pure depression. Girls with a history of social anxiety (K–SADS–PL social phobia rating $\geq 1$) but no history of depressive symptoms were categorized as pure social anxiety. Girls with a history of symptoms of both disorders (with both K–SADS–PL major depression and social phobia rating $\geq 1$) were classified as comorbid, and girls with no symptoms of either disorder were classified as no symptoms. We ran a one-way analysis of variance (ANOVA) comparing the four groups on the family and peer variables. Means and standard deviations for each group are presented in Table 4. We found significant differences between groups for number of female friends, $F(3, 79) = 4.233$, $p < .01$; and alienation from friends $F(3, 79) = 3.30$, $p < .05$; and parents, $F(3, 79) = 6.49$, $p < .001$. To determine the source of these differences, we performed a Dunnett test comparing all three groups to the comorbid group. The comorbid group showed significantly greater alienation from both friends and parents than the pure depression group, greater alienation from parents than the purely anxious group, and significantly fewer friends than the anxious group (all $ps < .05$).

We chose to define groups based on symptom comorbidity rather than diagnostic comorbidity because (a) some evidence suggests that depression–anxiety comorbidity is stronger at the symptom level (see Hiller, Zaudig, & von Bose, 1989), and (b) relatively low numbers of girls with diagnosable depression/social anxiety would leave a low sample size in disorder cells. To ensure that this decision did not bias results, we reran these analyses, this time including only girls meeting full diagnostic criteria in the pure depression, pure social anxiety, and comorbid groups. Results were identical in terms of significance.

## DISCUSSION

This study sought to identify interpersonal correlates of depressive symptoms and social anxiety in adolescent girls, controlling for comorbid symptoms. Results suggested that depressive symptoms and social anxiety have distinct interpersonal components. Social anxiety showed evidence for an association with peer variables, including lowered social competence, decreased trust and communication in friendships, and fewer close friends. The relationship between social anxiety and family variables was somewhat less consistent. Self-report symptoms were not significantly related to any family variables when controlling for depressive symptoms. This would seem to suggest that the interpersonal dysfunction associated with social anxiety chiefly manifests in peer relationships, at least among early adolescent girls. As teens are probably more likely to be rejected by peers than parents, it makes sense that fear of rejection (a primary component of social anxiety) would be more salient in peer interactions than in familial relationships. On the other hand, interview-assessed social anxiety was related to several family variables, such as father–child conflict and parental trust, communication, and alienation. Perhaps as social anxiety begins to reach clinical levels (such as that assessed by clinical interview), it begins to interfere with family relationships in addition to peer relationships.

Although our study is an important starting point, further research should clarify the relation between social anxiety and family dysfunction. Note that some previous research has linked social anxiety to certain aspects of family dysfunction (e.g., overprotective parenting and parental rejection; Bogels, van Oosten, Muris, & Smulders, 2001; Caster, Inderbitzen, & Hope, 1999; Lieb et al., 2000). However, most of this research has not controlled for comorbid depression. Johnson et al. (2005) examined social anxiety and depression separately and also found that depression more strongly related to family environment variables. Future research should reexamine previous findings linking social anxiety to family variables and determine if comorbid depression confounds results.

When controlling for social anxiety, depressive symptoms showed a stronger relationship with family variables, including lower parental trust and greater parental conflict, alienation, and relationship stress. This finding is consistent with previous research linking adolescent depression with family dysfunction and poor parental relationships (e.g., Armsden et al., 1990; Johnson et al., 2005; Lasko et al., 1997; Sheeber et al., 1997). Depressive symptoms were related not only with adolescent-reported measures but also with parent-reported relationship stress, suggesting that this association is not simply the result of negatively distorted perceptions of family relationships by depressed adolescents. Of interest, depressive symptoms were associated with reporting a *greater* number of close friends. This finding is somewhat counterintuitive, given previous evidence that close friendship protects *against* the development of depressive symptoms (La Greca & Harrison, 2005). Note, however, that reporting a greater number of close friends is not necessarily equivalent to having a higher number of high quality friendships, as many friendships may be superficial or predicated on maladaptive behavior.

Girls with depressive symptoms also reported a greater number of male friends. This result is especially interesting in light of recent evidence for an association between depression and romantic involvement in adolescence (Davila et al., 2004; Joyner & Udry, 2000), implying that this relationship may extend to platonic opposite sex friendships. Although mechanisms behind the association are unclear, one plausible explanation is that the challenges of opposite sex relationships are corrosive to girls' psychosocial functioning, as girls at this age may lack the skills necessary to navigate the complicated waters of heterosocial involvement. Alternatively, depressed girls may seek romantic involvement to boost self-esteem. As opposite sex friendships often serve as the basis for the development of romantic relationships in early adolescence (Connolly & Goldberg, 1999), the elevated number of male friends may represent dysphoric girls' early attempts to initiate romantic relationships. It is interesting that a previous study (Compian, Gowen, & Hayward, 2004) found no relationship between opposite sex platonic involvement and girls' depressive symptoms in a somewhat younger sample of sixth graders, perhaps because this association begins later as heterosocial involvement begins to become more socially salient.

Loneliness and alienation were associated with both depressive symptoms and social anxiety and may potentially play a role in comorbidity, either as shared risk factors or as mediators in temporal causal chains. Girls with comorbid symptoms also showed especially high levels of alienation from both parents and friends. Although these results should be replicated in larger samples, they offer some tentative further support of the role of alienation in comorbidity. Moreover, feelings of alienation might account for the greater symptom severity and worse treatment outcomes associated with comorbidity, a hypothesis that future research should explore. Alienation can be construed as a feeling of separation from significant others (O'Donnell, Schwab-Stone, & Ruchkin, 2006; Schabracq & Cooper, 2003). Perhaps difficulty connecting to others prevents comorbid youth from effectively seeking support or from building therapeutic alliances with therapists (a key predictor of treatment outcome; Castonguay, Goldfried, Wiser, & Raue, 1996; Martin, Garske, & Davis, 2000).

A limitation of this study is our inability to make causal inferences using cross-sectional, correlational data. These variables may be causes or consequences of depressive symptoms and social anxiety. They may have reciprocal relationships, in which symptoms predict interpersonal dysfunction, which in turn predicts the worsening of symptoms. Alternatively, these variables may be etiologically unrelated concomitants of symptoms. Examining temporal relationships would provide some insight into causal relationships and is a necessary next step. Once temporal relationships have been established, more elaborate models of comorbidity may be developed and tested. Shared correlates may act as common risk factors for the development of both depression and anxiety or as mediators in temporal relationships between disorders. Note that these two models are not mutually exclusive; some variables may serve as shared risk factors, whereas others serve as mediators.

A further limitation of this study is that, as our sample was recruited from the community, participants showed relatively low levels of psychopathology (although rates roughly coincided with point prevalence rates found in other adolescent community studies; Lewinsohn et al., 1993). Future research should replicate these results in a clinical sample, as it is unclear whether interpersonal dysfunction shows the same relationship to diagnosable disorders as to subsyndromal symptoms. We relied on interview-assessed and self-reported dimensional measures of symptoms because continuous data offer greater statistical power and subsyndromal symptoms are often clinically significant problems associated with social dysfunction and later psychopathology (Judd et al., 1998). Further, some evidence suggests that depression–anxiety comorbidity is stronger at the symptom level than at the diagnosis level (Hiller et al., 1989), possibly suggesting that mechanisms of comorbidity act at the symptom level. Thus, examining correlates of symptom comorbidity may provide insight into disorder comorbidity.

### Implications for Research, Policy, and Practice

Notably, the differential pattern of interpersonal correlates of depression and anxiety could not have been deciphered by looking only at the zero-order correlations. For example, the bivariate relationship between depressive symptoms and low interpersonal competence appears to be the result of shared variance with social anxiety. This underscores a major shortcoming of the current research literature on interpersonal factors of psychopathology, as many studies have failed to account for substantial covariance between symptoms of different disorders. For the purposes of identifying unique etiological factors or determining how disorders may be related to each other, partialing out potentially confounding comorbid symptoms is critical.

Future research should attempt to replicate these results in larger samples. For example, we examined differences between comorbid and noncomorbid groups using a one-way ANOVA. An alternative analytic strategy is to examine differences in a 2 (history of depressive symptoms) $\times$ 2 (history of social anxiety) ANOVA, allowing for the examination of both main and interaction effects. However, this method requires more statistical power to identify significant effects. This strategy did not yield significant interaction effects for any variable; we suspect that this is because of the sample size rather than a lack of actual differences between groups. Still, our results should be interpreted with the appropriate caution and should serve as preliminary data for future research in larger samples, which would allow for more definite conclusions as well as the differentiation of main and interaction effects. It also may be important to examine the relationship between symptoms and interpersonal correlates at different developmental stages. As peers tend to continue to grow in importance through adolescence (Furman & Buhrmester, 1992), peer-related factors may be a stronger predictor of depressive symptoms in late adolescence. Future research should also consider gender differences. It is possible that some interpersonal variables show different associations to social anxiety and depression in boys. If interpersonal variables are more predictive of internalizing symptoms among girls, or if girls show higher levels of interpersonal risk factors than boys, it may provide some insight into adolescent girls' heightened vulnerability to depression and social anxiety.

Our study may also have implications for treatment and public policy. Therapists should be aware of the interpersonal dysfunction, both in family and peer realms, that often accompanies depression and social anxiety. To the extent that these difficulties serve as etiological or maintenance factors (a question that should be examined in future research), they may be appropriate targets of treatment. Further, it may be worthwhile to develop programs targeted at youth who may be at risk for depression and anxiety as a result of poor peer and family relationships as a way to reduce risk and improve interpersonal functioning. This may help buffer against the development of symptoms or, alternatively, reduce the negative impact of depression and social anxiety on interpersonal relationships.

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