A Lab-Based Examination of Adolescent Girls' Expressed Negative Cognitions in Response to an In Vivo Social Stressor: Links to Depressive Symptoms

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Observational methods were used to examine the interaction of expressed negative cognitions to an in vivo social stressor as a concurrent predictor of adolescent girls' depression. Thirty adolescent females and their close friends participated in a lab-based paradigm that involved an impromptu speech task which was designed to serve as an in vivo social stressor. Adolescents who demonstrated a tendency to make expressed negative cognitions that were global rather than specific reported higher concurrent levels of depressive symptoms. Indirect (i.e., relational and reputational) peer victimization moderated the effect of observed expressed negative cognitions and depressive symptoms, providing preliminary observational evidence in support of prior research on cognitive vulnerability-stress models. Theoretical and clinical implications of findings are discussed.

Cognitive factors have been implicated as important and potentially malleable precursors to the development of depressive symptoms (see Abela & Hankin, 2008, for a review). Specifically, cognitive theories posit that negative belief systems and maladaptive thought processes confer a vulnerability to depression. The vast majority of cognitive theories conceptualize this vulnerability in terms of a diathesis-stress model, meaning that maladaptive cognitive appraisals about the self and the world increase an individual's susceptibility to develop depressive symptoms when faced with stressful life events (see Kaslow, Adamson, & Collins, 2000, for a review). A subset of cognitive theories of depression focus on the importance of maladaptive inferences regarding

the causes, consequences, and implications of negative events, and on misperceptions related to the ability to exert control over such events. One such cognitive diathesis-stress theory, the hopelessness model (Abramson, Metalsky, & Alloy, 1989), suggests that a depressogenic inferential style predisposes individuals to the development of depression. Specifically, three distinct depressogenic inferential styles have been associated with cognitive vulnerabilities to the development of hopelessness depression: (1) a tendency to attribute negative events to global and stable causes, (2) a tendency to perceive many catastrophic consequences in response to negative events, and (3) a tendency to perceive one's self as flawed in response to negative events. An increased likelihood of making depressogenic inferences following negative events has been linked to increased feelings of hopelessness, and hopelessness is believed to be a proximal cause of hopelessness depression (see Abela & Hankin, 2008).

Studies have examined the hopelessness model within adult populations, and a growing empirical base recently has accumulated to suggest that this model may be applicable ttto youth (e.g., Abela, McGirr, & Skitch, 2007; Hankin, Abramson, & Siler, 2001; Lewinsohn, Joiner, & Rohde, 2001). Empirical findings to date have supported theorized associations between adolescent depression and negative attributional style (e.g., Abela, 2001). Several studies also have demonstrated prospective associations between depressogenic cognitive styles predicting later depressive symptoms in adolescence (Hankin et al, 2001; Lewinsohn, Allen, Seeley, & Gotlib, 1999). There is evidence that girls are more likely than boys to experience, encode, and negatively interpret life events, suggesting greater cognitive vulnerability to depression, particularly in adolescence, and that this difference may partially explain disparate prevalence rates of depression among males and females that first appear at the transition to adolescence (Hankin & Abramson, 2001; Twenge & Nolen-Hoeksema, 2002).

A second predominant cognitive theory of depression proposed by Beck (1967, 1983) also posits specific mechanisms through which an individual's cognitive style may confer a heightened risk of depression. Beck contends that depressed individuals have mental representations of the self and past experiences (i.e., schemata) that are negatively biased, such that there is a tendency to filter out positive self-knowledge and exaggerate negative self-referent information. These depressogenic schemata are activated in response to stressful experiences and are believed to influence how individuals perceive and encode information in a given situation. Specifically, individuals who develop depressogenic schemata typically respond to negative events by engaging in a series of negative errors in thinking, such as catastrophizing and overgeneralizing. These negative errors in thinking may underlie the development of a negative cognitive triad that is comprised of three depressogenic cognitive styles: negative views of the self, the world, and the future. Beck suggests that this triad represents a proximal cause of depression and there is some preliminary empirical support for his cognitive theory in child and adolescent samples (e.g., Lewinsohn et al., 2001).

Both of the aforementioned theories offer a somewhat similar conceptual framework for understanding how the activation of cognitive vulnerability factors (e.g., depressogenic attributional style, negative views of the self, world, and future) may directly influence the content of an individual's perceptions and interpretations of negative events, and ultimately lead to depression. Despite the important contributions of these theoretical conceptualizations to understanding the emergence and maintenance of depressive symptoms, these models frequently have been critiqued for failing to consider the emotional and environmental contexts in which cognitions occur (Lemerise & Arsenio, 2000). In particular, the utility of cognitive models of depression is largely

predicated on the assumption that the examination of global social-cognitive skills will help to explain how an adolescent interprets a specific stressful event, and whether these cognitions are likely to generate behavioral responses that confer risk for psychopathology. In the case of depression, the measurement of attributional style in past research quite often reflects the implicit assumption that attributional errors will be applied globally and consistently across a variety of life stressors and domains (e.g., academic, family, peers). However, it has been hypothesized that substantial intra-individual variability in a person's tendency to derive negative attributions likely exists (Hankin, Fraley, & Abela, 2005); individuals likely possess "specific vulnerabilities" to stressful events (e.g., negative attributions especially regarding peer stressors) that are particularly associated with depression when activated by a similarly themed stressor (Hankin & Abramson, 2001). Individuals may be most likely to exhibit a depressogenic attributional style when confronted with a specific stressor that is especially salient and relevant to their sense of overall self-concept (Beck, 1987). Moreover, the study of specific attributions is perhaps particularly relevant for youth who may not have yet developed a stable and consistent attributional style (Abela, 2001; Abela & Sarin, 2002; Adams, Abela, & Hankin, 2007; Nolen-Hoeksema, Girgus, & Seligman, 1992), and there is some evidence that cognitive vulnerability factors are less inter-related among children and early adolescents than among adults (e.g., Adams et al., 2007; Hankin, 2005).

This study examined adolescent girls' specific attributions following an experimentally presented in vivo stressor. The stressor involved a "Social Stressor Speech Task," a procedure commonly used in psychophysiological research to elicit a stress response (e.g., Klimes-Dougan, Hastings, Granger, Usher, & Zahn-Waxler, 2001). In the present study, the speech task had an interpersonal theme because it was expected that a social stressor would be especially meaningful for girls. Indeed, past work has suggested that self-assessment of interpersonal skill and social evaluation may be particularly relevant to females' global self-worth and mood because these domains match culturally defined gender stereotypes and expectations (Bem, 1981; Maccoby, 1998). Consistent with these theories, girls report more frequent interpersonal stressors and greater emotional reactivity to interpersonal stressors than do boys during adolescence (Rudolph, 2002). Thus, an interpersonal stressor may be most likely to elicit cognitive interpretations that are relevant to depression in girls.

A second methodological limitation of some past work pertains to the emotional context in which attributions are assessed. In traditional studies using self-report assessments, questionnaires regarding attributional styles are administered to individuals while in an emotionally neutral state (i.e., as part of a general survey battery). However, theory and research suggest that individuals' responses to events likely vary as a function of emotional arousal (Dodge & Somberg, 1987; Forgas & Locke, 2005). Therefore, not only may attributions to a specific event vary based on the emotional salience of the event (Lemerise & Arsenio, 2000), but individuals' ability to accurately *report* their attributions to a past or hypothetical event may vary based on their level of arousal at the time of reporting (Dodge & Somberg, 1987). Indeed, there is evidence that in samples of adults, primed assessments of cognitive vulnerability factors (i.e., priming through activation of negative mood states or stressors) predict increased depressive symptoms following negative events, and that these predictions are stronger than those made by unprimed associations (e.g., Abela & Brozina, 2004; Abela, Brozina, & Seligman, 2004). Although these compelling findings offer insight into

the importance of emotional arousal in understanding cognitive vulnerability factors, there have been few studies examining the priming hypothesis in children and adolescents (e.g., Joorman, Talbot, & Gotlib, 2007; Taylor & Ingram, 1999). These findings underscore the potential value of observational methods in understanding how cognitive processes actually operate in real-life, stressful situations.

To address the aforementioned methodological issues, the present study examined two hypotheses. First, it was expected that adolescent girls' negative self-evaluative statements about their performance following an experimentally presented, interpersonally themed speech stressor task would be concurrently associated with self-reported depressive symptoms. The specific attributions reflected in adolescent girls' negative self-evaluative statements following an in vivo stressor were assessed and are referred to as "expressed negative cognitions." Our measurement of expressed negative cognitions using observational procedures addresses the aforementioned limitations; however, it should be noted that such cognitions are not isomorphic with the causal attributions typically assessed by well-established self-report instruments. Specifically, the measure of expressed negative cognitions offers a complement to self-report measures by assessing global and stable attributions using a novel assessment approach. Although expressed negative cognitions do not replace the implicit and private thoughts are measured using traditional self-report procedures, this construct may be useful for study in its own right. In particular, expressed negative cognitions may be highly relevant to integrating cognitive and interpersonal theories of depression because cognitions that are overtly expressed lend themselves to interpersonal reinforcement.

As a second hypothesis, the potential moderating influence of self-reported peer victimization was examined. Specifically, it was hypothesized that adolescents' expressed negative cognitions following the lab-based stressor would represent an index of a diathesis, or vulnerability factor that may be associated with concurrent depressive symptoms in the context of a self-reported, distal stressor, namely peer victimization. Our focus on peers was based on two factors. First, adolescence is recognized as a developmental period that involves a significant increase in the frequency of interactions with peers (Brown, 1990). Specifically, adolescence typically involves more opportunities to interact autonomously with peers, expand peer networks, and adopt new social roles. These changes parallel an increase in the number of possible peer stressors experienced as adolescents rely more heavily on peers for social and emotional support (e.g., Furman & Burhmester, 1992). Second, the transition to adolescence is marked by changes in the meaning and significance of peer relationships. Indeed, adolescence represents a period of identity development that involves increased self-evaluation and greater reliance on peer feedback and perceived peer evaluation as bases for a sense of self-concept (Harter, 1999).

Recent research has identified two primary forms of peer victimization. Overt victimization refers to physical violence or verbal threats aimed at inflicting or threatening physical harm. In contrast, indirect victimization (i.e., including relational and reputational victimization) refers to the experience of being excluded or socially manipulated by peers who intentionally use social relationships as a means of causing harm (e.g., rumor spreading, malicious gossip, friendship withdrawal; Crick & Grotpeter, 1995; 1996). Indirect victimization may be especially relevant for girls for several reasons. First, adolescent girls generally report having more close friends than do boys and these friendships are characterized by higher levels of intimacy (Berndt, 1982; Urberg, Degirmencioglu, Tolson, & Halliday-Scher, 1995). As such, disruptions to these close

relationships may be particularly problematic for girls' adjustment. Second, there are data to suggest that adolescent girls experience more indirect victimization than do boys, in part because girls are more likely to perpetrate acts of indirect aggression (e.g., Crick & Bigbee, 1998; Crick & Grotpeter, 1996). Although gender differences in self-reported indirect victimization have been somewhat inconsistent across studies (e.g., Prinstein, Boergers, & Vernberg, 2001), findings do suggest that girls are significantly more likely to be targeted by indirectly aggressive acts than by overtly aggressive acts (Phelps, 2001). Moreover, girls report higher levels of negative affect than boys in response to experiences of indirect victimization (Crick, 1995; Crick, Grotpeter, & Bigbee, 2002; Paquette & Underwood, 1999).

METHOD

Participants

A total of 30 female adolescents participated as target participants in the study with a self-nominated close friend. The participants predominantly were in the 7th (56%) and 8th (40%) grades; two of the participating friends were in grades 6 and 9. The ethnic distribution of the sample was 85.0% White/Caucasian; 3.3.% Asian-American; 8.3% Latina-American, and 3.3% Other/Mixed Ethnicity within a city of fairly homoge-neous, middle-class socioeconomic status residents (per capita income = \$25,175; Connecticut State Department of Education, 2000).

Target Participant and Friend Recruitment. Participants were recruited from two middle schools within the same town. All 7th and 8th grade adolescent girls in each school were invited to participate and asked to return a signed parental consent form allowing investigators to contact families with further study details. Out of 284 girls, a total of 152 (54%) returned consent forms. Of these, 138 (91%) agreed to be con-tacted with additional information. Thirty-six girls were selected at random from this sample of 138 consented adolescents to participate in the observational study. A sub-set was selected because the collection of observational data was limited by available resources; however, the sample compares favorably to other studies examining dyads of friends (e.g., Connolly, Geller, Marton, & Kutcher, 1992), and was not significantly different from the full sample on demographic variables. Thirty of these girls (83%) were successfully recruited into the observational study and thus were the target par-ticipants. Each target adolescent was asked to nominate a same-sex friend with whom she did not have a familial relationship and who was within two years of age (and two school grades). Friends were contacted and asked to reciprocate the nature of their re-lationship with the target, and friends' parents provided informed consent. Thus, each dyad included a target adolescent and a friend. A total of 89% of target adolescents at-tended the lab visit with a friend who was the same age and in the same grade. A total of 80% of dyads included two girls of the same ethnicity. The ethnic distribution of these 60 girls was not significantly different from the ethnic distribution of the school district community from which they were drawn, χ^2 (3) = 1.42, NS.

Procedures

Social Stressor Speech Task. Target adolescents and best friends participated in an observational battery designed to understand friendship behaviors (see Dishion, Spracklen, Andrews, & Patterson, 1996). Following the completion of this battery, target adolescents were asked to participate in a "Social Stressor Speech Task," commonly used in psychophysiological research (e.g., Klimes-Dougan et al., 2001). Target adolescents were oriented towards a camera within an observational setting that was connected to a closed-circuit "feedback screen" displaying their own image. Target adolescents were instructed to face this camera and feedback screen while preparing for and then delivering a one-minute impromptu speech ostensibly to an audience of peers watching the live video feed in a nearby room. This study used a speech prompt with a developmentally appropriate topic. Specifically, target adolescents were asked to convince the ostensible viewers of this video that they should be selected to participate in a fictional television show about teenagers by discussing self-relevant characteristics. The Speech Task has been shown to elicit meaningful variability in cardiovascular responses among adolescents (Hastings, Zahn-Waxler, & Usher, 2007) and is commonly used as an in vivo stressor. The target adolescents' best friend remained in the room during the speech task.

Immediately following the completion of the speech, target adolescents were given two minutes of unstructured time to talk with their friend before the next task. A research assistant then provided the dyad with four written discussion prompts regarding the target adolescents' speech performance (i.e., "How well did you/your friend do on the speech?"; "What were the best and worst parts of the speech?"; "Would you/your friend be selected for the fictional TV show?"; "How do you feel after completing the speech?"). These prompts were provided to ensure that all adolescents dedicated some discussion to the speech and the target adolescents' speech performance. All questions were worded to ensure that either positive or negative statements were equally likely, and that responses could include either task-relevant statements (i.e., the task was fun/stupid) or self-relevant statements (i.e., I did well/poorly). Dyads were asked to discuss their thoughts in response to these prompts for four minutes. Target adolescents' self-relevant utterances during this two-minute unstructured and four-minute structured discussion were used to code expressed negative cognitions along the global/specific and stable/unstable dimensions central to cognitive vulnerability-stress hypothesis of hopelessness depression.

Coding

Observational Coding. Trained teams of coders separately rated each videotaped interaction using the Relationship Processes Coding System (Heilbron & Prinstein, 2005), which is a coding system adapted from the original Conversation Topic Code developed by Poe, Dishion, Griesler, and Andrews (1990) and the Autonomy and Relatedness Coding System (Allen, Hauser, Bell, McElhaney, & Tate, 1998). Both the unstructured and semi-structured discussions following the speech task were coded. Instances of performance-relevant, expressed negative cognitions were identified independently by coders. Such statements were defined as any self-focused or personally relevant verbal statement that addressed one's performance on the speech task and included self-critical or self-deprecatory content. Examples included expressed nega-

tive cognitions of personal qualities in reference to the speech (e.g., "I'm such a loser") and negative evaluations of social performance (e.g., "I stink at giving speeches") or expectations for future events (e.g., "I could never be on television"). Each subsequent expressed negative cognition was coded as a separate episode in exactly the manner described above. It should be noted that these expressed negative cognitions were not necessarily causal attributions about the individual's performance; however, consistent with Beck's cognitive triad, the statements coded represented negative views of the self or of future performance, thus reflecting a theorized depressogenic cognitive pattern.

Next, expressed negative cognitions were coded on two separate dimensions in accordance with the hopelessness theory of depression (Abramson et al., 1989): global/specific and stable/unstable. Each expressed negative cognition was coded on each of these dimensions. Despite the fact that the dimensions of global/specific and stable/unstable are typically examined in the context of evaluating causal attributions for negative events, the dimensions were of interest in this preliminary observational study because they offer a conceptual framework for coding negative self-statements. As such, the codes were used to assess the nature of the statements made by participants, regardless of whether there was a clear causal attribution regarding performance on the speech task. This decision was made to minimize the need for coders to draw any inferences as to whether a given statement represented a causal attribution, a negatively skewed interpretation of the experience, or a negative view of the self.

Although previous research on self-reported attributional style typically examined a composite of the globality and stability dimensions (e.g., Abela, Aydin, & Auerbach, 2006; Abela et al., 2007), the present study considered the independent contributions of these dimensions in the prediction of depressive symptoms. With respect to the global/specific dimension, a code of *global* was assigned to any statement that expressed a belief that a situation could be generalized to other areas or circumstances in the individual's life (e.g., "I'm always bad at making speeches," "I'm terrible at presenting anything"). A code of *specific* was assigned to any statement that was qualified as only being true in a particular instance (e.g., "I was bad at that speech," "Sometimes I'm bad at public speaking"). A code of *stable* was assigned to any expressed negative cognition that was characterized by an inability to change the situation or conveyed a sense that a situation was likely to persist (e.g., "I'm awful at presenting and it's never going to get better. I'll be terrible this year at school when we do speeches"). Note that this is different from *global* in that *stable* is referring to the expectation that the situation is unlikely to change (i.e., the extension of a poor performance on the speech to the likely poor performance on future speeches), whereas global is referring to comments that suggest an influence in areas beyond the specific instance being discussed (i.e., the extension of a poor performance on the speech to broader negative evaluation of the self). A code of unstable was assigned to expressed negative cognitions that suggest that the situation is unlikely to persist and would not likely be repeated in the future (e.g., "I didn't do well on that speech, but I would do so much better if I could do it again").

For each dimension, an overall score was computed for expressed negative cognitions. Specifically, the proportion of global expressed negative cognitions was computed by dividing the number of global expressed negative cognitions by the total number of negative expressed cognitions. The same process was used to compute scores for stable/unstable expressed negative cognitions. Thus, it was predicted that higher scores on the measures of global/specific expressed negative cognitions and stable/unstable expressed negative cognitions should correspond to higher levels of

depressive symptoms. All interactions were coded by two independent coders who participated in extensive training for approximately four months prior to assigning codes. Interrater reliability was calculated based on randomly double coding of 30 percent of the sample across coders. Reliability estimates were computed using Cohen's kappa coefficients ($\kappa = .96$ for the global/specific dimension and $\kappa = .80$ for the stable/unstable dimension).

Questionnaire-Based Measures

Several additional constructs were assessed using traditional questionnaire-based assessment instruments. All questionnaires were administered prior to observational protocol.

Depressive Symptoms. The Children's Depression Inventory (CDI; Kovacs, 1992) is a 27-item measure designed to assess cognitive and behavioral depressive symptoms in children and adolescents. For each item, respondents select from one of three statements, scored 0 through 2, that best described their level of depressive symptoms in the previous two weeks. Good psychometric properties have been reported for the CDI as a reliable and valid index of depressive symptoms (Saylor, Finch, Spirito, & Bennett, 1984); it can be used with youth between the ages of 7 and 18 years of age (Kazdin, 1990). In the current sample, internal consistency was high ($\alpha = .93$).

Attributional Style. The revised Children's Attributional Style Questionnaire (CASQ-R; Kaslow & Nolen-Hoeksema, 1991) was used to assess adolescents' attributional style. The CASQ-R is a 24-item, forced-choice questionnaire that describes 12 positive and 12 negative hypothetical events. Participants are instructed to imagine each event happening to them and then decide which of the two provided explanations best describes the cause of the event. For a given item, two of the dimensions of attributional style (i.e., internal/external, stable/unstable, global/specific) are held constant while the third is varied. Consistent with hopelessness theory, the internality dimension was de-emphasized, and a composite score for negative events subscales was calculated by adding together stable and global scores across each respective category of items. This yielded an overall score reflecting a pessimistic cognitive style. Scores on this scale range from 0 to 8, with higher scores indicating a more pessimistic attributional style. The psychometric properties of the CASQ-R have been shown to be acceptable with moderate internal consistency for the overall composite score and fair test–retest reliability (Thompson, Kaslow, Weiss, & Nolen-Hoeksema, 1998). In this sample, the coefficient alpha was found to be .52, which is reasonably consistent with prior research findings (e.g., $\alpha = 0.61$; Thompson et al., 1998).

Overt and Indirect Victimization. The Victimization subscales of the Revised Peer Experiences Questionnaire (RPEQ; Prinstein, Boergers, & Vernberg, 2001) were used to assess overt and indirect forms of victimization. This questionnaire includes 18 items that reflect different forms of victimization, including physical/overt, two forms of indirect victimization (i.e., relational, reputational), as well as adolescents' receipt of prosocial peer behavior. Adolescents are asked to report the frequency of how often they have been the recipient of each form of behavior (i.e., 1 = never; 2 = once or twice; 3 = a few times; 4 = about once a week; and 5 = a few times a week) over the past year. The RPEQ has demonstrated acceptable psychometric properties in past research (De Los Reyes & Prinstein, 2004; Prinstein et al., 2001). In the present

study, the internal consistency of the subscales of overt interest was good: physical/overt (3 items; α = .86), relational (7 items; α = .83), and reputational victimization (3 items; α = .94). Recent research suggests theoretical similarities between relational and reputational victimization. Indeed, a combined broad-band subscale of indirect victimization including all 10 items yielded adequate internal consistency (α = .91) and was used in all subsequent analyses.

RESULTS

Preliminary Analyses

Descriptive statistics for all primary study variables are presented in Table 1. A total of 81 expressed negative cognitions were made by 21 of the target adolescents. Inspection of means in Table 1 suggests that following a speech stressor, adolescent girls were likely to make expressed negative cognitions that were stable; the overall mean on this dimension was significantly different from zero, t = 2.18, p < .05, d = .27. For the overall sample, there was no significant tendency for girls to make expressed negative cognitions on the global dimension, t = 1.54, NS, d = .29.

Pearson correlations were computed among primary variables (see Table 1). Results indicated that among the two coded dimensions, the global and stable expressed negative cognitions were positively correlated, suggesting that a tendency to express negative cognitions that were global in nature was associated with a tendency to express negative cognitions that were stable. A higher proportion of global expressed negative cognitions was associated with higher concurrent levels of both self-reported depressive symptoms and with pessimistic attributional style as measured by the CASQ-R. A similar pattern of correlations was observed for a higher proportion of stable expressed negative cognitions. As would be expected, depressive symptoms were positively correlated with self-reported pessimistic attributional style.

Cognitive Vulnerability-Stress Model: Moderating Effect of Peer Victimization

A primary goal of this study was to examine associations between adolescent girls' expressed negative cognitions following an experimentally presented, interpersonally themed stressor and depressive symptoms. The potential moderating effects of peer victimization were examined to test the hypothesis that adolescents' expressed negative cognitions following the lab-based stressor would represent a valid index of a diathesis that would be concurrently associated with depressive symptoms.

Hierarchical multiple regression analyses were conducted to examine this central hypothesis. To increase power for these analyses, each coded dimension of expressed negative cognitions (i.e., global/specific, stable/unstable) was examined in a separate model. For each model, depressive symptoms were entered as a criterion variable. The effects of overt and indirect victimization were examined in separate models. Thus, in an initial step, the dimension of expressed negative cognitions and one form of peer victimization (i.e., overt, indirect) were entered as predictor variables. The interactive

TABLE 1. Descriptive Statistics (*M, SD*) and Pearson Correlations Among Primary Variables

	1	2.	3	4	5	6
Behavioral Observations						
1. Global expressed negative cognitions	—	.86**	.34†	-.14	-.36	.50*
2. Stable expressed negative cognitions.		—	.46*	.14	-.21	.42†
Self-Report						
3. Pessimistic attributional style			-.11	.43*	.29	-.46*
4. Overt victimization				—	.69**	.32
5. Indirect victimization					—	.31
6. Depressive symptoms						—
Mean (SD)	-.02 (.07)	-.04 (.15)	1.86 (1.53)	1.36 (.67)	1.99 (.77)	7.70 (8.42)

†$p < .05$, one-tailed; *$p < .05$ two-tailed, **$p < .01$, two-tailed.

effect of each form of peer victimization was examined by entering an interaction term of peer victimization and the dimension of expressed negative cognitions as a predictor variable in the second step (see Table 2).

Results from the model that examined the two dimensions of expressed negative cognitions as predictors of depressive symptoms reflected a pattern of findings generally consistent with hypotheses. Main effects indicated that a tendency to express negative cognitions that were global in nature was a significant predictor of concurrent depressive symptoms. However, ultimately the main effect was qualified by a significant two-way interaction between global expressed negative cognitions and indirect peer victimization (semi-partial correlation = .65, $p < .001$), providing preliminary support for an in vivo demonstration of the effects of stress on expressed negative cognitions. Regression lines were calculated at one standard deviation above and below the mean of the moderator variable and then plotted to examine the slope of the association between indirect victimization and depressive symptoms separately within each group (see Aiken & West, 1991; Holmbeck, 2002). Post hoc probing of this interaction effect suggested that at high levels of global expressed negative cognitions there was a significant, positive association between indirect victimization and depressive symptoms, b = 2.73, $SE = .56$, $p < .0001$. However, at low levels, there was a significant negative association between indirect peer victimization and depressive symptoms, b = -1.13, $SE = .27$, p < .001. No significant main or interactive effects for the stable/unstable dimension or any effects for interactions with overt victimization were revealed. It is important to note that statistical power was limited to detect significant effects and thus nonsignificant findings should be interpreted with caution.

DISCUSSION

Past research examining cognitive vulnerability-stress theories of depression has suggested that individuals' interpretations of stressful experiences are important predictors of depressed mood. Indeed, studies have typically examined individuals' attribu-

TABLE 2. Global/Specific Expressed Negative Cognitions and Indirect Peer Victimization
as Concurrent Predictors of Depressive Symptoms (*N* = 30)

Variable	*B*	*SE* β	β
Step 1			
Global expressed negative cognitions	12.68	2.47	6.57***
Indirect peer victimization	.80	.17	1.76***
Step 2			
G/S x indirect peer victimization	12.07	2.55	5.67***

Note. R^2 = .28 for Step 1 (*p* < .01); ΔR^2 = .42 for Step 2 (*p* < .001). ****p* < .001.

tional style using self-reported attributions for hypothetical negative events. Although findings have offered important insights into how cognitive vulnerability confers risk for depression, past work has rarely examined specific cognitive responses to real-life stressors at times of emotional arousal. To address this gap in the literature, the present observational study offered a preliminary examination of observed expressed negative cognitions in response to a specific, in vivo stressor. A benefit of this paradigm is the ability to examine individuals' actual behavior in a moment of genuine stress. Results offered promising evidence for this procedure as a method for assessing expressed negative cognitions. Additionally, past work rarely has examined these ideas among youth, despite the likelihood that unique vulnerabilities to depression emerge in adolescence, thus requiring careful consideration at that developmental stage. By addressing each of these limitations, this study offered a complement to questionnaire-based methods that have provided support for a cognitive vulnerability-stress model among adolescents, perhaps especially as pertaining to interpersonally themed stressors.

Results provided preliminary support for use of an observational paradigm for examining cognitive responses to an in vivo stressor. Specifically, significant associations were revealed between adolescents' expressed negative cognitions that were global in nature and their self-reported attributional style on a traditional instrument. Associations also were revealed between adolescents' in vivo expressed negative cognitions and their reported symptoms of depression. There also were several noteworthy limitations to this procedure. For example, the use of an observational paradigm necessitated an exclusive reliance on data that was observable (i.e., verbally expressed). Although it is unknown whether attributions verbally expressed are accurate indicators of internalized and implicit processing of cognitions, several conditions of this experiment maximized the likelihood that this offered a valid and unique window into cognitive processing. First, all utterances coded were spontaneous and immediately followed a provocative event; these conditions provide diminished opportunity for deliberation or screening of utterances. Second, adolescents were asked to discuss their feelings and thoughts about the in vivo stressor with a close friend. This procedure significantly enhances the ecological validity of this assessment, as adolescent girls confide in best friends more than other potential sources of social support, and they typically establish relationships with best friends characterized by high levels of intimacy and emotional disclosure (Furman & Buhrmester, 1992; Laursen, 1996).

Finally, several issues regarding the coding of expressed negative cognitions are worth noting. First, results suggested that responses that were global, but not stable, were predictive of concurrent depressive symptoms and that this effect was moderated by peer victimization; however, it is important to note that questionnaire-based studies of the hopelessness theory of depression generally examine a composite score

involving the combination of global and stable responses. For the present study, the independent effects of each of these two dimensions were examined. Although these dimensions are theoretically separable, results of the present study suggest that they may not be empirically separable. Given limited statistical power and the preliminary nature of the present study, it must be acknowledged that the results are not without important limitations. It is imperative that future observational studies examine whether the theoretical and empirical distinctions between the global and stable dimensions are maintained. It also is noteworthy that expressed negative cognitions do not necessarily reflect causal attributions, and this approach admittedly does not allow for a comprehensive test of cognitive vulnerability-stress model. Other approaches (e.g., Content Analysis of Verbatim Explanations; Peterson, Schulman, Castellon, & Seligman, 1992) have offered strategies for assessing spontaneous attributions in narrative accounts and have demonstrated promising results (e.g., Shulman, Castellon, & Seligman, 1989). Taken together, the study of attributional style using multiple approaches and methods presents a valuable step towards understanding associations between attributions and depressive symptoms.

Results also offered preliminary support consistent with prior research on cognitive vulnerability-stress models using an observational paradigm as a procedure for assessing expressed negative cognitions. Adolescents' tendency to state global negative self-evaluations was associated concurrently with depressive symptoms when combined with the past experience of actual negative social experiences (i.e., indirect peer victimization). It is noteworthy that results supported a model of girls' indirect victimization, as the subtle, reputational sensitivities that are targeted in acts of indirect victimization came closest to the types of stress that was invoked by the in vivo speech stressor task used in this experiment. This procedure was developed specifically to examine cognitive vulnerabilities in adolescent girls, and results suggested that the cognitions measured following this stressor task, coupled with the peer experiences most commonly experienced in girls, indeed was a potent correlate of depression.

Although results from this initial investigation should be regarded as preliminary, findings yield important clinical implications. The assessment of cognitions following an actual in vivo stressor, if replicated, may be useful in targeting clinical interventions aimed at behavioral patterns known to predict risk for future depression. For example, it may be that particular cognitive behavioral techniques (e.g., role plays, thought records) are most effective when applied to in vivo stressors. It also may be that treatments designed to address specific cognitive vulnerability factors may be warranted. Indeed, Abela and Sarin (2002) conceptualized cognitive vulnerability to depression in terms of an individual's most depressogenic inferential style. Thus, it may be that observational methods could help identify how specific cognitive vulnerabilities may be more strongly associated with depression, thus informing research on prevention and intervention. To that end, the extension of observational methods to the study of clinical samples of adolescents also would provide an opportunity to examine the generalizability of findings to more highly distressed populations.

Future observational research efforts examining cognitive theories of depression in youth would benefit from addressing several key limitations of the present study. First, the findings are limited by the relatively small sample size. Although the sample is comparable in size to samples used in other observational studies (e.g., Baker, Milich, & Manolis, 1996; Connolly et al., 1992; Sheeber & Sorenson, 1998), it may have restricted the ability to detect more modest effects. Given that prior studies of the cognitive-vulnerability stress interaction in adolescents have reported small to moder-

ate effect sizes, a larger sample size may be necessary to more accurately test the hypotheses (see Lakdawalla, Hankin, & Mermelstein, 2007, for a review). In addition, findings from the present study are based exclusively on a community-based sample of adolescent girls. Inclusion of adolescent boys would provide an important contribution to the literature on the emergence of gender differences in depressive symptoms. Similarly, the comparison of adolescent boys' and girls' responses to interpersonal and non-interpersonal stressors would offer an opportunity to determine whether interpersonally themed stressors may yield different cognitive and affective responses by gender. Assessments of adolescents experiencing clinically significant levels of depression also would be important for understanding associations between expressed negative cognitions and depressive symptoms. The use of longitudinal prospective designs would offer an important opportunity to examine the temporal relations between cognitions, stressors, and depressive symptoms, and thus provide a test of the cognitive vulnerability-stress model. Indeed, the lack of prospective data limits any conclusions that may be drawn from the present study regarding this model; however, preliminary concurrent analyses offer promising support for the use of observational methods in future prospective studies. Finally, the assessment of peer victimization using peer-reported measures would reduce method variance issues between the assessment of mood and perceived stress.

Overall, these results offer important support for the measurement of observed cognitions in response to an in vivo stressor as a potentially informative index of depressogenic attribution biases. Results also provided additional evidence in support of the extant empirical literature on cognitive vulnerability-stress theory of depression in adolescents--in this case, as related to a peer stressor and cognitive responses to an interpersonally themed stimulus. Continued work examining the types of stressors that are especially likely to be associated with depression among adolescents is critical for informing the development of effective preventive interventions.

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