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Somatic Symptoms and Anxiety Among African American Adolescents

Julie Newman Kingery
Hobart and William Smith Colleges

Golda S. Ginsburg
Johns Hopkins University School of Medicine

Candice A. Alfano
Children's National Medical Center

Somatic symptoms are an associated feature of anxiety disorders that have received little research attention among non-White samples. In addition, the majority of previous studies have examined the influence of somatic symptoms in a cross-sectional rather than a prospective manner. This study examines the prevalence of 12 somatic symptoms, the association of somatic and anxiety symptoms (both concurrently and prospectively) with psychosocial functioning, and gender differences in somatic symptoms among a community sample of 114 African American adolescents (57 girls). In all, 83% of the sample reported at least one somatic symptom (some or most of the time within the past 2 weeks), and on average, adolescents reported 2.5 somatic symptoms. Somatic symptoms correlated positively with severity of anxiety symptoms and negatively with aspects of perceived competence. After the initial level of anxiety symptoms was controlled for, somatic symptoms were a unique predictor of perceived competence (at initial assessment) and anxiety symptoms (at 6-month follow-up). Overall, girls endorsed significantly more somatic symptoms than did boys. Findings replicate those of studies with White samples and suggest that somatic symptoms may be a risk factor for anxiety disorders among African American youth.

Keywords: *anxiety; somatic symptoms; adolescents; African American*

Somatic symptoms, such as muscle tension, stomachaches, and headaches, are associated with psychopathology in general (e.g., depression, disruptive behavior problems) and anxiety specifically among children and adolescents (e.g., Dhossche, Ferdinand, van der Ende, & Verhulst, 2001; Egger, Costello, Erkanli, & Angold, 1999; Garber, Walker, & Zeman, 1991). With respect to anxiety, somatic symptoms have been linked to higher severity of anxiety symptoms among community (Garber et al., 1991; Muris & Meesters, 2004; White & Farrell, 2006) as well as clinical samples of youth (Beidel, Christ, & Long, 1991; Ginsburg, Riddle, & Davies, 2006). For example, among a community sample of 190 children (ages 8-13), those who reported experiencing more frequent and intense somatic symptoms (based on the Children's Somatization Inventory) had higher levels of trait anxiety (Muris & Meesters, 2004).

The body of research examining somatic symptoms among youth has several limitations. First, the majority of these studies are cross-sectional in nature, and therefore there are limited data on the relationship between somatic symptoms and anxiety symptoms prospectively. In addition, few studies have assessed the relationship between somatic symptoms and aspects of psychosocial functioning (e.g., social adjustment, self-esteem). Furthermore, the majority of studies have considered a global index (i.e., total number) of somatic symptoms rather than the prevalence and role of individual somatic symptoms. Assessing a total number of somatic symptoms encompasses a wide range of physical symptoms and does not provide information about which individual somatic symptoms are the most relevant to anxiety. A greater understanding of specific somatic symptoms could lead, through a direct inquiry about key somatic symptoms, to early detection of youth who are at risk for anxiety disorders.

Another important limitation of this body of empirical literature that must be addressed is that the majority of studies have included predominantly White samples. Additional research on the prevalence and influence of somatic symptoms among non-White samples, including African American youth, is needed. Specific somatic symptoms may serve as red flags for problems with anxiety among this population. There is preliminary evidence to suggest that anxiety is common among African American youth (see Barbarin & Soler, 1993) and that these youth may have a particular

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tendency to express anxiety in the form of physical symptoms. For example, recent research on anxiety sensitivity (i.e., the belief that anxiety-related symptoms will have deleterious effects) indicates that urban African American elementary schoolchildren endorse high levels of anxiety sensitivity, in comparison to White youth (Lambert, Cooley, Campbell, Benoit, & Stansbury, 2004). Research among adults indicates that African Americans tend to express mental health problems (e.g., anxiety, depression) in the form of somatic symptoms (Cooper-Patrick et al., 1999; Neal & Turner, 1991; Robins & Regier, 1991; Snowden & Pingitore, 2002). Similar to adults, African American youth also may have tendencies to express mental health problems, including anxiety, in the form of physical complaints. However, the prevalence and impact of somatic symptoms among this population are topics that warrant further empirical investigation.

Despite the limited number of studies of somatic symptoms among African American youth, one recent study (White & Farrell, 2006) has examined two specific somatic symptoms (headaches and abdominal pain) among a predominantly African American adolescent sample ($N = 528$; age range 11-14 years). Results of this study indicated that a large portion of the sample experienced headaches (40%) and abdominal pain (36%) on at least a weekly basis. Furthermore, more frequent headaches and abdominal pain were associated with increases in anxiety across a 6-month period. Although the White and Farrell (2006) study provides preliminary data on the prevalence of certain somatic symptoms among African American adolescents, it has several limitations. For example, only two somatic symptoms were included, and many key somatic symptoms (e.g., muscle tension, feeling restless, shortness of breath) were not assessed. In addition, the relationship between somatic symptoms and psychosocial adjustment (e.g., self-esteem, academic achievement, social adjustment) was not explored. Although the White and Farrell study is an important first step, it will be important for future research to assess a broader range of somatic symptoms and to explore the relationships among somatic symptoms, anxiety, and aspects of psychosocial functioning (e.g., self-esteem, social adjustment) among African American youth. Results of this research could inform the development of an assessment of key somatic symptoms for identifying youth who are experiencing somatic symptoms related to anxiety and who could benefit from early intervention strategies.

To fill these gaps in the literature, this study examined (a) the extent to which African American adolescents endorsed 12 somatic symptoms (as well as the mean number of somatic symptoms endorsed); (b) the relation between somatic symptoms and levels of anxiety symptoms, both concurrently and prospectively during a 6-month period; (c) the relation between

somatic symptoms and psychosocial functioning (e.g., global self-esteem, social competence); and (d) possible gender differences in the reporting of somatic symptoms.

On the basis of previous research, it was hypothesized that (a) somatic symptoms would be common among African American youth (i.e., would occur at rates comparable to, if not higher than, prevalence rates from other published studies of youth); (b) highly anxious youth would endorse higher levels of somatic symptoms than would youth with low levels of anxiety, and somatic symptoms would be positively associated with anxiety, both concurrently and prospectively (after controlling for initial anxiety symptoms); (c) somatic symptoms would be negatively related to psychosocial functioning and would uniquely predict psychosocial functioning (after partialing out anxiety symptoms); and (d) girls would endorse higher rates of somatic symptoms, consistent with the findings of several previous studies exploring gender differences in somatic symptoms (Garber et al., 1991; Muris & Meesters, 2004; White & Farrell, 2006).

METHOD

PARTICIPANTS

As part of a larger study of adolescent fears and anxiety, all students ($N = 204$) in a parochial urban high school were given parental permission/consent forms describing the study. Signed informed consent forms were returned by 56% of all students, and these students provided their own assent. There were no exclusion criteria that precluded adolescents' participation in the study. As such, the sample for this study included 114 adolescents (50% girls, $n = 57$) recruited from an urban parochial high school with a history of educating African American students.

Participants were in 9th through 12th grade ($M = 10.33$, $SD = 1.07$) and ranged in age from 14 to 19 years ($M = 15.77$, $SD = 1.18$). Demographic information obtained from the school indicated that 100% of the students were African American, 35% of the students were living below the poverty level, and the majority of students (75%) lived in single-parent households. Study participants represented 56% of the school's total population and were similar to the total school population in grade level and age; however, significantly more of the study participants were girls ($\chi^2 = 5.00$, $p < .05$). The 56% response rate represents adolescents who returned signed parental consent forms and were present on the day of administration of study measures. School officials did not allow the researchers to access additional demographic data for this sample.

At 6-month follow-up, data on anxiety symptoms were available for 58% of the original sample ($n = 66$; 34 boys, 32 girls). Adolescents who participated in the follow-up assessment were significantly younger ($M = 15.4$ years) than the rest of the sample ($M = 16.2$ years), $t(112) = -3.71$, $p < .001$, but the ratio of boys to girls was similar for these two groups.

MEASURES

Multidimensional Anxiety Scale for Children (MASC; March, Parker, Sullivan, Stallings, & Conners, 1997). Somatic symptoms were assessed using the 12 items from the physical symptoms subscale of the MASC, a 39-item self-report instrument that measures a broad range of anxiety symptoms in youth 8-19 years old. The physical symptoms subscale includes items related to feeling tense and restless (e.g., I feel tense or uptight, I get shaky or jittery, I feel restless and on edge) and somatic/autonomic arousal (e.g., I have trouble getting my breath, I have pains in my chest, I feel sick to my stomach). See Table 1 for a complete list of items. Items were scored using a 4-point scale (i.e., *never true*, *rarely true*, *sometimes true*, *often true*). Instructions indicated that youth should answer based on how they had been feeling during the past 2 weeks. Endorsement of symptoms was dichotomized (*yes/no*) so that a percentage endorsement for each somatic symptom could be calculated, facilitating comparisons between results of this study and those of other published studies (e.g., Dhossche et al., 2001; Garber et al., 1991). Responses of *never* and *rarely true* were coded as "no," whereas responses of *sometimes* and *often true* were coded as "yes." The coefficient alpha for the physical symptoms subscale with these recoded items was acceptable ($\alpha = .71$).

The MASC has strong test-retest reliability (.70 to .90 during a 3-month interval), internal consistency (interclass correlations from .60 to .90), and ample evidence of convergent and divergent validity with both clinic and community samples (e.g., March et al., 1997; March, Sullivan, & Parker, 1999). Using a community sample of youth (8-18 years; 54% White, 34% African American, 12% other), March et al. (1999) reported no significant differences between African American and White youth on the MASC total or subscale scores, but test-retest reliabilities were slightly lower for African American youth.

Screen for Child Anxiety Related Emotional Disorders (SCARED; Birmaher et al., 1997). The SCARED is a 41-item self-report measure that assesses a broad range of anxiety symptoms (i.e., somatic/panic, generalized anxiety, separation anxiety, social phobia, school phobia). Youth

TABLE 1
Somatic Symptoms for Total Sample and by Gender

<i>Somatic Symptom</i>	<i>% Yes</i>		
	<i>Total (N = 114)</i>	<i>Boys (n = 57)</i>	<i>Girls (n = 57)</i>
Feel tense or uptight	44.1	29.6	57.9**
Get shaky or jittery	17.9	8.9	26.8*
Jumpy	18.6	12.5	24.6
Feel strange, weird, or unreal	9.8	7.3	12.3
Feel restless and on edge	27.7	30.9	24.6
Hands shake	18.0	7.3	28.6**
Trouble getting my breath	18.9	16.7	21.1
Get dizzy or faint feelings	17.7	14.3	21.1
Pains in chest	20.5	18.2	22.8
Heart races or skips beats	18.9	13.0	24.6
Feel sick to stomach	26.1	11.1	40.4***
Hands feel sweaty or cold	19.6	14.5	24.6
Mean number of somatic symptoms (<i>SD</i>)	2.5 (2.4)	1.8 (1.5)	3.3** (2.8)

* $p < .05$. ** $p < .01$. *** $p < .001$.

respond to each item (e.g., “I worry about sleeping alone,” “I worry about what is going to happen in the future,” “I get really frightened for no reason at all”) using a 3-point Likert-type scale with choices ranging from *not true or hardly ever true* to *very true or often true*. The SCARED total score, derived by summing the responses to the 41 items, ranges from 0 to 82.

Using an outpatient clinic sample of 341 youth (9-18 years, $M = 14.5$ years), Birmaher et al. (1997) reported adequate internal consistency ($\alpha = .74-.93$) and test-retest reliability (interclass correlation coefficients of .70 to .90 during a 4-day to 15-week interval) for the SCARED total score and each of the five factors. Boyd, Ginsburg, Lambert, Cooley, and Campbell (2003) reported adequate psychometric properties for the SCARED with this sample of African American high school students; however, the factor structure varied from the normative sample. In this study, coefficient alpha for the SCARED total score was excellent (.89).

Self-Perception Profile for Adolescents (SPPA; Harter, 1988). The SPPA was used to assess domains of perceived self-competence. On this 45-item self-report questionnaire, youth respond to statements regarding their perceived competence across nine different domains (i.e., academic, social, athletic, physical appearance, behavior, close friendship, job, romantic

appeal, global self-worth/esteem). For each item, young people choose one of two statements that is more true of them (e.g., "Some young people do their school work really well BUT Other young people don't do their school work really well") and then select whether the statement is *sort of true* or *really true*. Scores are summed and averaged to produce a mean score for each of the nine subscales. Higher scores represent a more positive self-concept.

Harter (1988) reported acceptable internal consistency for the SPPA ($\alpha = .74-.93$ across the nine subscales). In addition, this instrument has been used with ethnically and racially diverse samples (Smith & Brody, 2000). In this study, coefficient alphas for the nine subscales were found to be acceptable, ranging from .61 to .84.

PROCEDURE

On the first day of the study, students with parental consent were asked to provide written assent (all but one teen agreed). Trained graduate research assistants administered the self-report measures to these youth in groups during elective classes that were part of the regular school day. Initial items were read aloud, and the research assistants circulated throughout the classroom to answer students' questions throughout the testing session. Adolescents completed the measures silently and were reminded that their data would be confidential. In addition, questionnaire packets were labeled with identification numbers (rather than names). After 6 months, a subset of self-report measures from the larger study was readministered with the same procedures in a similar classroom session.

RESULTS

DESCRIPTIVE STATISTICS

Frequencies of the 12 somatic symptoms are presented in Table 1 for the total sample and by gender. In all, 83% of the total sample reported at least one somatic symptom as occurring sometimes or often during the past 2 weeks (19 of the 114 adolescents endorsed no somatic symptoms), and on average, 2.5 somatic symptoms were reported per adolescent ($SD = 2.4$; range, 0-10). The following somatic symptoms were the most common across the total sample: feel tense or uptight (44%), feel restless and on edge (27%), feel sick to stomach (26%), pains in chest (20%), and hands feel sweaty or cold (19%).

TABLE 2
Somatic Symptoms for Low- and High-Anxiety Groups

<i>Somatic Symptom</i>	<i>% Yes</i>	
	<i>Low^a (n = 32)</i>	<i>High^b (n = 35)</i>
Feel tense or uptight	34.4	64.7*
Get shaky or jittery	3.1	29.4**
Jumpy	6.3	38.2**
Feel strange, weird, or unreal	3.1	17.6
Feel restless and on edge	25.0	35.3
Hands shake	0	41.2***
Trouble getting my breath	16.1	22.9
Get dizzy or faint feelings	9.4	29.4*
Pains in chest	6.3	32.4**
Heart races or skips beats	9.4	29.4*
Feel sick to stomach	15.6	41.2*
Hands feel sweaty or cold	9.4	32.4*
Mean number of somatic symptoms (<i>SD</i>)	1.4 (1.3)	4.0*** (2.9)

a. Low-anxiety group: 21 boys, 11 girls.

b. High-anxiety group: 13 boys, 22 girls.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Girls endorsed significantly more somatic symptoms than boys did (3.3 and 1.8, respectively; $t = -3.58$, $df = 112$, $p < .01$). Specifically, girls were more likely than boys to report the following: feel tense or uptight ($\chi^2 = 8.99$, $p < .01$), get shaky or jittery ($\chi^2 = 6.09$, $p < .05$), hands shake ($\chi^2 = 8.52$, $p < .01$), and feel sick to stomach ($\chi^2 = 12.28$, $p < .001$).

DIFFERENCES IN INDIVIDUAL SOMATIC SYMPTOMS BETWEEN HIGHLY ANXIOUS YOUTH AND YOUTH WITH LITTLE ANXIETY

To examine whether individual symptoms differentiated highly anxious youth from youth with little anxiety, two groups were created. The "high anxious" group comprised those who scored within the clinical range on the SCARED (total score ≥ 25 , $n = 35$, top 30% of the sample). The "low anxious" group included youth whose SCARED total score was 12 or lower ($n = 32$, bottom 30% of sample). Table 2 displays the mean number of somatic symptoms and frequencies for each of the 12 somatic symptoms for the high- and low-anxiety groups. Youth in the low-anxiety group (21 boys, 11 girls) reported a mean of 1.4 somatic symptoms, whereas youth in the high-anxiety group (13 boys, 22 girls) reported a mean of 4.0 somatic symptoms.

This difference was statistically significant ($t = -4.71$, $df = 65$, $p < .001$). Several of the individual somatic symptoms were endorsed significantly more often among the high-anxiety youth than among the low-anxiety youth (see Table 2). Specifically, youth in the high-anxiety group were more likely to endorse the following somatic symptoms: feel tense or uptight ($\chi^2 = 6.07$, $p < .05$), get shaky or jittery ($\chi^2 = 8.20$, $p < .01$), jumpy ($\chi^2 = 9.60$, $p < .01$), hands shake ($\chi^2 = 16.72$, $p < .001$), get dizzy or faint feelings ($\chi^2 = 4.18$, $p < .05$), pains in chest ($\chi^2 = 7.10$, $p < .01$), heart races or skips beats ($\chi^2 = 4.18$, $p < .05$), feel sick to stomach ($\chi^2 = 5.25$, $p < .05$), and hands feel sweaty or cold ($\chi^2 = 5.21$, $p < .05$).

CONCURRENT RELATION BETWEEN SOMATIC SYMPTOMS AND ANXIETY

Pearson correlation coefficients between total number of somatic symptoms and overall anxiety symptom severity (as measured by the SCARED total score with the 13 somatic/panic items removed—hereafter referred to as “SCARED total” score; $\alpha = .86$) were calculated for the total sample and separately by gender. Somatic symptoms were significantly positively correlated with anxiety symptom severity for the total sample. However, when examined separately by gender, the correlation was statistically significant for girls only (see Table 3).

SOMATIC SYMPTOMS AS A PREDICTOR OF ANXIETY SYMPTOMS ACROSS TIME

Total somatic symptoms at study entry (as measured by the sum of the 12 physical symptom items from the MASC) were examined as a unique predictor of anxiety symptoms across a 6-month follow-up interval for 58% of the original sample ($n = 66$; 34 boys, 32 girls). Hierarchical linear regression analyses predicting symptoms of anxiety at the 6-month follow-up (as measured by the SCARED total score) were conducted for the total sample, for boys, and for girls.¹ Initial anxiety symptom severity and total somatic symptoms were entered as predictors in the regression models. For the total sample, somatic symptoms were a unique predictor of anxiety symptoms at the 6-month follow-up ($\beta = .27$, $p < .05$, $R^2 = .29$).

RELATIONSHIP BETWEEN SOMATIC SYMPTOMS AND PERCEIVED COMPETENCE

Pearson correlation coefficients between total number of somatic symptoms and perceived competence (as measured by the SPPA subscales) are

TABLE 3
Correlations Between Somatic Symptoms, Anxiety Severity, and Perceived Competence

<i>Measure</i>	<i>Correlation With Total Somatic Symptoms</i>		
	<i>Total Sample</i>	<i>Boys</i>	<i>Girls</i>
SCARED total (with somatic items removed)	.51**	.25	.61**
SPPA global self-worth	-.40**	-.22	-.55**
SPPA social	-.32**	-.18	-.41**
SPPA romantic appeal	-.28**	-.19	-.41**
SPPA athletic	-.26**	-.05	-.15
SPPA job	-.23*	-.21	-.40**
SPPA physical appearance	-.21*	-.19	-.27*
SPPA close friendship	-.21*	-.09	-.40**
SPPA behavior	-.19*	-.21	-.23
SPPA academic	-.18	-.23	-.21

NOTE: SCARED = Screen for Child Anxiety Related Emotional Disorders (Birmaher, et al., 1997); SPPA = Self-Perception Profile for Adolescents (Harter, S., [1988]).

* $p < .05$. ** $p < .01$.

presented in Table 3. Correlations were calculated for the total sample and separately by gender. Somatic symptoms were significantly negatively correlated with several aspects of perceived competence for the total sample. However, when examined separately by gender, the correlations were significant for girls only.

SOMATIC SYMPTOMS AS A UNIQUE PREDICTOR OF PERCEIVED COMPETENCE

Because many of the correlations between somatic symptoms, severity of anxiety symptoms, and perceived competence were significant (see Table 3), we were interested in examining whether somatic symptoms were a unique predictor of perceived competence or whether this association might be better explained by anxiety symptom severity. Hierarchical linear regression analyses predicting each aspect of perceived competence were conducted for the total sample. SCARED total scores were entered on the first step of the model, and total somatic symptoms were entered on the second step. For the total sample, somatic symptoms were a unique predictor of global self-worth ($\beta = -.37, p < .001, R^2 = .16$), social competence ($\beta = -.21, p < .05, R^2 = .14$), and behavioral competence ($\beta = -.24, p < .05, R^2 = .04$).

DISCUSSION

This study examined four primary targets: (a) the prevalence of 12 somatic symptoms, (b) the concurrent and prospective association between somatic and anxiety symptoms, (c) the concurrent relation between somatic symptoms and psychosocial functioning, and (d) gender differences in the endorsement of somatic symptoms among a community sample of urban African American adolescents. Findings generally supported hypotheses in that somatic symptoms were common and youth with higher levels of anxiety and poorer self-competence reported higher levels of somatic symptoms. Specific findings are discussed below.

PREVALENCE OF SOMATIC SYMPTOMS

The majority of adolescents (83%) endorsed at least one somatic symptom as having occurred sometimes or often during the past 2 weeks. The following somatic symptoms were the most common: tense (43%), restless (27%), sick to stomach (26%), chest pain (20%), hands sweaty or cold (20%), heart races (19%), and trouble getting breath (19%). Prevalence rates of somatic symptoms endorsed by adolescents in this study were at least comparable to, if not higher than, rates reported in prior studies based on community samples of youth. For instance, Garber et al. (1991) reported that 56% of a sample of 540 children and adolescents (Grades 2-12; 73% White, 23% African American, 4% Asian, 0.6% Hispanic) endorsed at least one somatic symptom. The following prevalence rates of individual somatic symptoms were reported by Garber et al.: nausea/upset stomach (17%), chest pain (10%), heart beating too fast (9%), and trouble catching breath (11%). Rates of stomachaches in the present study were slightly lower than those reported by White and Farrell (2006), who found that 36% of African American adolescents experienced abdominal pain on at least a weekly basis. However, the present study utilized different criteria for endorsement of symptoms (i.e., sometimes or often during the past 2 weeks).

Rates of somatic symptom endorsement in this study were also comparable to, if not higher than, rates reported across studies based on samples of clinically anxious youth. For example, Last (1991) reported that 60% of clinically anxious children and adolescents ($N = 158$; 83% White, 16% African American) endorsed significant somatic complaints, and Masi, Favilla, Millepiedi, and Mucci (2000) found that 74% of youth with a diagnosis of anxiety and/or depression ($N = 162$; racial composition not reported) endorsed at least one somatic symptom. It should be noted that comparisons to prior community and clinical studies of somatic symptoms

are made with caution because of various methods of assessment (e.g., interview, various self-report questionnaires), varying age ranges of participants, and differences in the types of somatic symptoms being assessed. Overall, however, the rates of somatic symptoms in this study are noteworthy, as frequent experience of somatic symptoms may negatively affect adolescents' physical well-being and development, interfere with daily functioning, and place them at risk for developing clinically significant problems with anxiety and other forms of psychopathology.

RELATION BETWEEN SOMATIC SYMPTOMS AND SYMPTOMS OF ANXIETY

Not only did somatic symptoms predict concurrent levels of anxiety in this study, but somatic symptoms predicted anxiety symptomatology across a 6-month follow-up interval. This finding highlights the role of somatic symptoms as a risk factor and potential predictor of future difficulties with anxiety and is consistent with previous cross-sectional research linking somatic symptoms to higher levels of anxiety symptoms (e.g., Garber et al., 1991; Muris & Meesters, 2004). The significant links between somatic symptoms and anxiety in the present study indicate that it may be possible to identify African American adolescents with high levels of anxiety by conducting a brief assessment of key somatic symptoms.

The association between somatic and anxiety symptoms among African Americans in this study is also consistent with a study linking mental health problems and physical complaints in African American adults (Robins & Regier, 1991). Rather than seek help from a mental health professional, African Americans were more likely than Whites to present to the emergency room or their general practitioner with physical complaints related to mental health problems such as anxiety and depression (Cooper-Patrick et al., 1999; Neal & Turner, 1991; Snowden & Pingitore, 2002). This may be related to the stigma associated with mental illness in the African American culture. Parental modeling of somatic symptoms and attitudes toward mental health problems could also play a role in how youth express these symptoms. Based on these cultural barriers and the link between somatic symptoms and anxiety symptomatology found in the present study, it is possible that African American adolescents are also presenting to primary care practitioners with physical complaints of mental health problems such as anxiety. Additional research on the relation between somatic symptoms and anxiety symptoms and disorders (or other forms of psychopathology) in primary care settings among African American youth is needed to test this hypothesis.

RELATION BETWEEN SOMATIC SYMPTOMS AND PERCEIVED COMPETENCE

Adolescents experiencing a greater number of somatic symptoms reported more negative self-perceptions (i.e., lower feelings of global self-worth, social competence, and behavioral competence). This finding highlights the potentially broad negative sequelae of somatic symptoms. Not only are high levels of somatic symptoms related to anxiety symptomatology among African Americans, but they are also associated with a lower level of perceived competence, which can, in turn, have a negative impact on academic performance and emotional functioning (Bouchey & Harter, 2005; Jacquez, Cole, & Searle, 2004; Tram & Cole, 2000). These results suggest that targeting somatic symptoms in treatment may lead not only to reductions in anxiety but also to improved functioning across multiple domains.

GENDER DIFFERENCES IN SOMATIC SYMPTOMS

Overall, African American girls endorsed significantly more somatic symptoms than boys did (3.3 and 1.8, respectively). In addition, girls reported higher rates of several individual somatic symptoms (i.e., feel tense or uptight, get shaky or jittery, hands shake, feel sick to stomach). Although findings on somatic symptoms and gender differences have been mixed, several studies have reported a higher prevalence of somatic symptoms for girls than for boys (e.g., Bernstein, Garfinkel, & Hoberman, 1989; Garber et al., 1991; Muris & Meesters, 2004). There are several possible explanations for this finding. It may be that girls experience more somatic symptoms than boys do because of biological or hormonal changes during adolescence. Alternatively, it may be that girls and boys experience the same levels of somatic symptoms but that girls are more willing than boys to report these symptoms (i.e., a reporting bias). Along related lines, boys in this study may have minimized their symptoms of anxiety in a manner consistent with socialization practices in the African American culture. Indeed, previous research indicates that within the African American culture, males are expected to appear strong and in control, and as a result, they tend to underreport symptoms of mental health problems (Block, 1981; Majors, Tyler, Peden, & Hall, 1994).

LIMITATIONS

Although this study represents an improvement over previous research, one limitation is that only 12 somatic symptoms were assessed. As such, other commonly reported somatic symptoms (e.g., headaches) may have

been overlooked. In addition, this study relied solely on adolescent self-report of somatic symptoms, anxiety symptoms, and perceived competence, which is problematic because adolescents may underreport feelings of distress. As such, we cannot be certain whether there are true gender differences in somatic symptoms or whether the gender differences found in this study are related to a male reporting bias. Furthermore, because of the small number of participants in this study (and hence limited statistical power), it was not possible to fully explore the relationship between somatic symptoms and anxiety or psychosocial functioning for boys and girls separately. The age range (14-19 years) was limited, which precluded dividing the sample into older and younger subgroups to explore possible age differences in the endorsement of somatic symptoms. In addition, this study did not include an assessment of medical problems such as hypoglycemia and asthma, which involve physical symptoms (e.g., shortness of breath) that overlap with the somatic symptoms related to anxiety. This study also did not include an assessment of factors such as participants' reading skills, learning difficulties, or intellectual functioning, which could have affected the validity of the self-report data.

Although youth with high levels of somatic symptoms reported higher levels of anxiety symptoms, this study did not assess whether youth met diagnostic criteria for an anxiety disorder or were experiencing clinically significant levels of impairments in their functioning. The generalizability of the findings is also limited because of the relatively small sample size, small number of students who participated in the 6-month follow-up assessment, and specific sample characteristics (e.g., the participation rate was 56%; the students were volunteers attending an inner-city parochial high school and were from low-income and predominately single-headed households). The extent to which these results apply to other African American adolescents or other racial or ethnic populations of adolescents is unknown.

FUTURE RESEARCH DIRECTIONS

It will be important for future research to replicate these results with other samples of African American youth and to directly compare prevalence rates of somatic symptoms reported by youth representing various ethnic and racial groups within one study. Future studies also should explore somatic symptoms as predictors of anxiety disorders as assessed by a diagnostic interview. The relationship between somatic symptoms and objective measures of impairment (e.g., academic achievement, participation in social activities, friendships, family relationships) also awaits investigation. Future studies should include a more comprehensive assessment of

environmental and cultural variables (e.g., community violence, identification with traditional African American cultural values) to determine the extent to which these factors play a role in the expression of somatic symptoms in African American youth. Given the potential for urban youth to be exposed to violence and other traumatic events, an assessment of symptoms related to posttraumatic stress disorder would also be informative. Finally, obtaining information from multiple informants (e.g., adolescents, parents, teachers) would provide a more comprehensive assessment of adolescents' anxiety symptoms and global functioning. If further research confirms that somatic symptoms are a red flag for anxiety symptoms in African American youth, then particular attention to somatic symptoms may enhance the identification and treatment of anxiety disorders in this underserved and understudied population.

NOTE

1. Age was entered in preliminary regression analyses, but this variable was not a significant predictor and was excluded from subsequent analyses.

REFERENCES

- Barbarin, O. A., & Soler, R. E. (1993). Behavioral, emotional, and academic adjustment in a national probability sample of African American children: Effects of age, gender, and family structure. *Journal of Black Psychology, 19*, 423-446.
- Beidel, D. C., Christ, M. G., & Long, P. J. (1991). Somatic complaints in anxious children. *Journal of Abnormal Child Psychology, 19*, 659-670.
- Bernstein, G. A., Garfinkel, B. D., & Hoberman, H. M. (1989). Self-reported anxiety in adolescents. *American Journal of Psychiatry, 146*, 384-386.
- Birmaher, B., Khetarpal, S., Brent, D., Cully, M., Balach, L., Kaufman, J., et al. (1997). The Screen for Child Anxiety Related Emotional Disorders (SCARED): Scale construction and psychometric characteristics. *Journal of the American Academy of Child & Adolescent Psychiatry, 36*, 545-553.
- Block, C. B. (1981). Black Americans and the cross-cultural counseling and psychotherapy experience. In A. J. Marsella & P. B. Pederson (Eds.), *Cross-cultural counseling and psychotherapy* (pp. 177-194). New York: Pergamon.
- Bouchey, H. A., & Harter, S. (2005). Reflected appraisals, academic self-perceptions, and math/science performance during early adolescence. *Journal of Educational Psychology, 97*, 673-686.
- Boyd, R. C., Ginsburg, G. S., Lambert, S. F., Cooley, M. R., & Campbell, K. D. M. (2003). Screen for Child Anxiety Related Emotional Disorders (SCARED): Psychometric properties in an African American parochial high school sample. *Journal of the American Academy of Child & Adolescent Psychiatry, 42*, 1188-1196.

- Cooper-Patrick, L., Gallo, J., Powe, N. R., Steinwachs, D. M., Eaton, W. W., & Ford, D. E. (1999). Mental health service utilization by African Americans and Whites: The Baltimore Epidemiologic Catchment Area follow-up. *Medical Care*, *37*, 1034-1045.
- Dhossche, D., Ferdinand, R., van der Ende, J., & Verhulst, F. (2001). Outcome of self-reported functional-somatic symptoms in a community sample of adolescents. *Annals of Clinical Psychiatry*, *13*, 191-199.
- Egger, H. L., Costello, E. J., Erkanli, A., & Angold, A. (1999). Somatic complaints and psychopathology in children and adolescents. *Journal of the American Academy of Child & Adolescent Psychiatry*, *38*, 852-860.
- Garber, J., Walker, L. S., & Zeman, J. (1991). Somatization symptoms in a community sample of children and adolescents: Further validation of the Children's Somatization Inventory. *Psychological Assessment: A Journal of Consulting and Clinical Psychology*, *3*, 588-595.
- Ginsburg, G. S., Riddle, M. A., & Davies, M. (2006). Somatic symptoms in children and adolescents with anxiety disorders. *Journal of the American Academy of Child & Adolescent Psychiatry*, *45*, 1179-1187.
- Harter, S. (1988). *Manual for the Self-Perception Profile for Adolescents*. Denver, CO: University of Denver.
- Jacquez, F., Cole, D. A., & Searle, B. (2004). Self-perceived competence as a mediator between maternal feedback and depressive symptoms in adolescents. *Journal of Abnormal Child Psychology*, *32*, 355-367.
- Lambert, S. F., Cooley, M. R., Campbell, K. D. M., Benoit, M. Z., & Stansbury, R. (2004). Assessing anxiety sensitivity in inner-city African American children: Psychometric properties of the Childhood Anxiety Sensitivity Index. *Journal of Clinical Child and Adolescent Psychology*, *33*, 248-259.
- Last, C. G. (1991). Somatic complaints in anxiety disordered children. *Journal of Anxiety Disorders*, *5*, 125-138.
- Majors, R., Tyler, R., Peden, B., & Hall, R. (1994). Cool pose: A symbolic mechanism for masculine role enactment and coping by Black males. In R. Majors & J. U. Gordon (Eds.), *The American Black male* (pp. 245-261). Chicago: Nelson-Hall.
- March, J. S., Parker, J. D. A., Sullivan, K., Stallings, P., & Conners, K. (1997). The Multidimensional Anxiety Scale for Children (MASC): Factor structure, reliability, and validity. *Journal of the American Academy of Child & Adolescent Psychiatry*, *36*, 554-565.
- March, J. S., Sullivan, K., & Parker, J. (1999). Test-retest reliability of the Multidimensional Anxiety Scale for Children. *Journal of Anxiety Disorders*, *13*, 349-358.
- Masi, G., Favilla, L., Millepiedi, S., & Mucci, M. (2000). Somatic symptoms in children and adolescents referred for emotional and behavioral disorders. *Psychiatry*, *63*, 140-149.
- Muris, P., & Meesters, C. (2004). Children's somatization symptoms: Correlations with trait anxiety, anxiety sensitivity, and learning experiences. *Psychological Reports*, *94*, 1269-1275.
- Neal, A. M., & Turner, S. M. (1991). Anxiety disorders research with African Americans: Current status. *Psychological Bulletin*, *109*, 400-410.
- Robins, L., & Regier, D. (1991). *Psychiatric disorders in America*. New York: Free Press.
- Smith, T., & Brody, G. H. (2000). Intra- and extracultural perceptions of competence in rural African American youth. *Journal of School Psychology*, *38*, 407-422.
- Snowden, L. R., & Pingitore, D. (2002). Frequency and scope of mental health service delivery to African Americans in primary care. *Mental Health Services Research*, *4*, 123-130.
- Tram, J. M., & Cole, D. A. (2000). Self-perceived competence and the relation between life events and depressive symptoms in adolescence: Mediator or moderator? *Journal of Abnormal Psychology*, *109*, 753-760.
- White, K. S., & Farrell, A. D. (2006). Anxiety and psychosocial stress as predictors of headache and abdominal pain in urban early adolescents. *Journal of Pediatric Psychology*, *31*, 582-596.