

# Suppressor Effects in Coping Research With African American Adolescents From Low-Income Communities

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**Objective:** The purpose of the current study was to demonstrate the replicable nature of statistical suppressor effects in coping research through 2 examples with African American adolescents from low-income communities. **Method:** Participants in the 1st example included 497 African American adolescents (mean age = 12.61 years,  $SD = 0.99$ ; 57% female) reporting on dispositional coping, and participants in the 2nd example included 268 African American adolescents (mean age = 12.90 years,  $SD = 1.27$ ; 56% female) reporting on situation-based coping. Participants in both samples completed self-report measures of coping strategies (Children's Coping Strategies Checklist and How I Coped Under Pressure Scale) and internalizing symptoms (Youth Self-Report, Children's Depression Inventory, and Revised Children's Manifest Anxiety Scale). **Results:** The results of structural equation modeling revealed significant suppressor effects, with active coping and support-seeking coping enhancing the association between avoidant coping and internalizing symptoms. **Conclusions:** The demonstration of replicable suppressor effects helps to advance coping research and intervention by providing evidence of the interdependence of coping strategies, thus increasing understanding of how coping strategies work together to predict outcomes. The current study offers recommendations for understanding associations among coping strategies within the context of suppression effects.

**Keywords:** coping, suppression, African American youth, depression, anxiety

Although basic coping research has tremendous potential to inform the development of effective interventions with young people, this potential has not yet been met (Coyne & Racioppo, 2000; Lazarus, 1993; Somerfield & McCrae, 2000). Beyond basic findings indicating that active, problem-solving coping is generally associated with positive outcomes (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001), much remains unknown about the ways in which coping strategies interact with one another in relation to outcomes. Such research is especially important for youth who have been underrepresented both in coping research and in the development of effective coping interventions. For example, low-income urban youth of color are in particular need for effective coping interventions given their high rates of exposure to severe and chronic stressors. However, few if any effective coping interventions have been validated for this population (Cardemil, Reivich, Beevers, Seligman, & James, 2007), and much remains to be learned about effective coping in the context of urban poverty.

As researchers work to advance knowledge on coping in youth and inform intervention design, a greater understanding

of the interdependence of coping strategies is needed (Lazarus, 2000). An examination of statistical suppressor effects in coping research can provide evidence of the interdependence of coping strategies. Statistical suppressor effects occur when the addition of a suppressor variable to a regression equation improves the predictive utility of another variable in the model. Specifically, the addition of one type of coping strategy to a prediction model may increase the association between another coping strategy and outcomes. The purpose of the current study was to demonstrate that statistical suppressor effects may be a replicable phenomenon in coping research via two examples with African American adolescents from economically disadvantaged communities. We aimed to highlight the utility of examining suppressor effects in coping research and to offer recommendations for studying coping within the context of suppression, for refining coping theory, and for designing clinical interventions to improve coping skills.

## Coping and Coping Models

The majority of basic coping research compares the respective efficacy of conceptually distinct strategies by focusing on the dissimilarities between the strategies, viewing certain types of coping strategies as antithetical (Lazarus, 2000; Roth & Cohen, 1986; Suls & Fletcher, 1985). For example, the approach versus avoidance coping model (Roth & Cohen, 1986) has been used frequently with African American youth exposed to high levels of stress (Boxer et al., 2008; Dempsey, 2002; Dempsey, Overstreet, & Moely, 2000; Edlynn, Gaylord-Harden, Richards, & Miller,

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This article was published Online First September 27, 2010.

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We wish to acknowledge the statistical assistance of Fred Bryant.

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2008; Grant et al., 2000; Mosher & Prelow, 2007).<sup>1</sup> However, because these broad models may not reflect coping behavior as it is observed in the real world, they may not be specific enough to guide interventions (Coyne & Racioppo, 2000). Indeed, research with adults has shown that individuals almost always use problem-focused and emotion-focused coping conjointly (Folkman & Lazarus, 1980; Lazarus & Folkman, 1984; Stone & Neal, 1984; Tennen, Affleck, Armeli, & Carney, 2000), suggesting that the interdependence of coping strategies may be more informative than overall mean scores of coping factors (Dewe, 2003). Lazarus (2000) noted that researchers should not separate conceptually distinct strategies to compare their efficacy, but should examine how they affect one another and outcomes.

Statistical suppressor effects in prediction models may provide evidence of interdependence of coping strategies, and these effects may also help to understand how interdependence is associated with psychosocial functioning. The likelihood of suppressor effects is greater in models with high associations between predictor variables (Cohen, Cohen, West, & Aiken, 2003). Research with low-income African American youth finds moderately strong, positive associations among coping variables, including coping strategies that are theoretically or conceptually distinct, such as approach and avoidant coping (Dempsey, 2002; Edlynn et al., 2008; Gaylord-Harden, Gipson, Mance, & Grant, 2008; Grant et al., 2000). Youth experiencing high levels of stress in low-income communities, such as exposure to violence and crime, inadequate schools, loss of peers or family members, and economic pressures, may use comparable levels of several different types of coping strategies rather than a preference for particular strategies (Dempsey, 2002; Pearlin & Schooler, 1978). Moreover, African American youth use significantly more types of strategies than youth from other ethnic groups (Halstead, Johnson, & Cunningham, 1993; Jose, Cafasso, & D'Anna, 1994; Ryan-Wenger & Copeland, 1994; Tolan, Gorman-Smith, Henry, Chung, & Hunt, 2002), all of which would be reflected in strong, positive intercorrelations between coping variables. Therefore, suppressor effects may be more likely to appear in coping research with African American youth from high-stress environments.

### Definitions of Suppression

Although no universal definition of suppression exists, almost all researchers have used the concept of variance in their conceptualization of suppression.<sup>2</sup> Predictor variance is partitioned into two parts: variance that the predictor shares with the criterion (valid variance) and variance that is independent of the criterion (error). Suppression occurs when a second predictor contributes to the regression equation indirectly by accounting for error variance in the first predictor. By removing error variance, it enhances the ability of the first predictor to explain criterion variance. Specifically, the suppressor variable controls for (suppresses) the irrelevant variance in the other predictor variables (variance it shares with the predictor), thereby causing the regression coefficient of the other predictor to be larger than it is when the suppressor is not in the model (Cohen et al., 2003; Conger, 1974).

In sum, suppression occurs when the simultaneous inclusion of two or more predictors improves the validity of one or both predictors (Paulhus, Robins, Trzesniewski, & Tracy, 2004). Cur-

rently, three types of suppression effects are described in the literature, and these three types of suppression are depicted in Figure 1. If the suppressor variable has a zero or very small correlation with the criterion variable, the situation is one of classical suppression (Horst, 1941). If the final beta weight of the suppressor variable is of opposite sign from its correlation with the criterion, it is a net or negative suppressor (Conger, 1974; Darlington, 1968).<sup>3</sup> In this situation, the other predictor's beta weight exceeds its correlation with the criterion (Cohen et al., 2003). Reciprocal or cooperative suppression occurs if the beta weights of both predictors exceed their respective correlation with the criterion, indicating suppressor effects for both variables (Cohen et al., 2003; Conger, 1974).

### Suppression in Coping Research

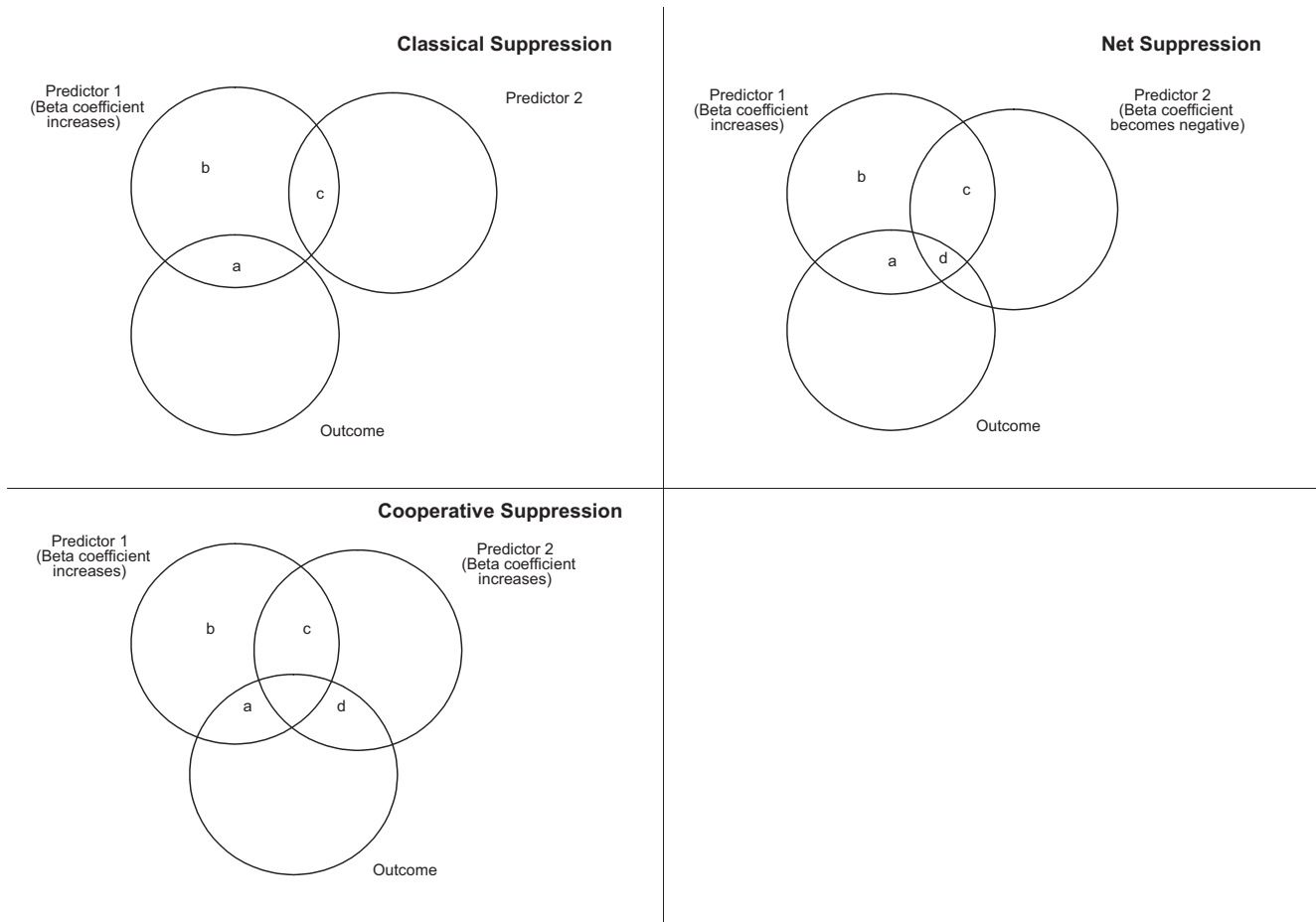
Coping research provides a fruitful route to examine the patterns of suppressor effects, as differences in the measurement of coping may have specific implications for the likelihood of suppression. A dispositional coping approach assumes that individuals develop habitual coping strategies that are used with the range of stressors they encounter (Aldwin, 1994; Bouchard, Guillemette, & Landry-Léger, 2004). Such an approach to measuring coping is likely to result in the reporting of multiple coping strategies, which may inflate the association between coping variables and increase the likelihood of suppressor effects. Alternatively, situation-based coping assumes environmental demands as primary in determining the coping strategy employed in response to a stressor (Aldwin, 1994; Aldwin & Brustrom, 1997; Lazarus & Folkman, 1984). The situational approach assumes that individuals "match" coping strategies with particular stressors, which may restrict the range of coping strategies that are reported. Thus, a demonstration of suppressor effects with situation-based coping may provide more compelling evidence for these effects.

Although previous coping research has not included a priori tests of suppressor effects, some researchers have detected suppressor effects among various coping strategies a posteriori. Suppressor effects have been found in adult coping research in a study examining coping in women after mastectomy procedures (Orr,

<sup>1</sup> However, factor-analytic procedures demonstrate that these broadband schemes do not adequately represent coping in youth samples and that narrow-band factors more accurately classify youth's coping behaviors (Ayers et al., 1996; Causey & Dubow, 1992; Dize-Lewis, 1988; Walker, Smith, Garber, & Van Slyke, 1997). For example, Ayers et al. (1996) examined various models of coping in a sample of elementary school children and concluded that a four-factor model (active, avoidant, distraction, and support seeking) was the best fit for conceptualizing coping in young people. Despite the support for narrow-band factors for organizing youth's coping behaviors, the narrow-band models are often conceptualized within an active or approach coping factor and an avoidant factor (e.g., Ayers et al., 1996).

<sup>2</sup> Velicer (1978) provided a definition of suppression that deviated from the use of the concept of "variance," and instead focused on the "usefulness" of suppression in terms of semipartial correlations. Velicer's definition states that suppression occurs when the semipartial correlation of the predictor and criterion is larger than the corresponding zero-order correlation.

<sup>3</sup> For all the definitions, the final beta weight is based on the use of two predictors in the regression model.



*Figure 1.* Depiction of three types of suppressor situations. *Classical suppression* occurs when Predictor 2 is not correlated with the outcome but is correlated with Predictor 1. Area a represents the unique contribution of Predictor 1, Area b represents error variance of Predictor 1, and Area c represents what is shared between Predictor 1 and Predictor 2. There is some error in Predictor 1 that is not correlated with the outcome but is correlated with Predictor 2 (Area c). The inclusion of Predictor 2 suppresses this error and improves the predictive validity of Predictor 1. *Net suppression* occurs when Predictor 2 has a positive correlation with the outcome but the beta coefficient for Predictor 2 is negative. Area a represents the unique contribution of Predictor 1, Area b represents error variance of Predictor 1, and Area c represents what is shared between Predictor 1 and Predictor 2. Although it accounts for a small amount of variance in the outcome (Area d), Predictor 2 suppresses the error variance in Predictor 1 (Area c) and improves the predictive utility of Predictor 1. *Cooperative suppression* occurs when Predictor 1 and Predictor 2 are correlated with the outcome and negatively correlated with each other (or vice versa). Area a represents unique contribution of Predictor 1, and Area d represents unique contribution of Predictor 2. Area b represents error variance of Predictor 1, and Area c represents what is shared between Predictor 1 and Predictor 2. Although each accounts for variance in the outcome, the predictors also suppress error variance in each other (Area c) and increase each other's predictive utility.

1986) and in a study of Vietnam veterans coping with combat-related trauma (Suvak, Vogt, Savarese, King, & King, 2002). In these examples, problem-focused strategies suppressed emotion-focused strategies. In a study of situational coping in adolescents, logical analysis coping showed a net suppressor effect on problem-solving coping, increasing problem-solving coping's positive association to well-being and negative association to distress (Ebata & Moos, 1991). In a study of children's dispositional coping, active coping showed a classical suppression effect on avoidant coping, increasing avoidant coping's positive associations to anx-

iety, depression, and conduct problems (Sandler, Tein, & West, 1994). Although it is difficult to draw firm conclusions from a few studies that did not specifically test for suppression, the findings imply that conceptually distinct coping strategies may have more theoretical similarities than previously thought. Further, suppression effects were demonstrated in both situational and dispositional measurements of coping. Still, what is missing is a direct examination of the replicability of suppressor effects and a discussion of how the effects may enhance theory and practice on coping.

Examinations of suppression effects have important implications for applications of coping findings in practice settings. Low-income, urban African American youth are less likely than European American youth and youth from other income environments to receive mental health services through traditional providers (Pastor, Reuben, & Falkenstern, 2004). In addition, African Americans report more negative attitudes about treatment after service use (Diala et al., 2000), and there is some evidence that existing treatments are not as effective for African American youth (Asarnow et al., 2009). In order to design and/or modify effective treatments for low-income, urban African American youth, it is essential that researchers understand the coping strategies that are most effective in managing the stressors endemic to urban poverty. Research on suppression effects in coping research represents an opportunity to better understand potentially complex relationships among coping strategies and outcome in this context. Findings from this research could be quite useful in developing and/or modifying effective interventions for this population.

### The Current Study

The purpose of the current study was to demonstrate that statistical suppressor effects may be replicable in coping research through two examples with African American adolescents from economically disadvantaged communities. If a suppressor effect is demonstrated in more than one sample, it can be concluded that true suppression may have occurred and theoretical explanations can be formulated (Collins & Schmidt, 1997; Maassen & Bakker, 2001). Therefore, in the current study, we examined suppressor effects in two independent samples. As youth move into adolescence, exposure to stressors increases, subsequently increasing the need for strategies to manage stress. At the same time, the development of more complex cognitive skills as well as larger social networks may increase adolescents' repertoire of coping strategies (Compas et al., 2001). Thus, early adolescence is an important time to examine patterns in the use of coping strategies. In Example 1, suppressor effects were examined in the prediction of internalizing symptoms for adolescents' reports of *dispositional* coping. In Example 2, suppressor effects were examined in the prediction of depressive and anxiety symptoms for adolescents' reports of situational coping.

#### Example 1: Predicting Internalizing Problems From Dispositional Coping

##### Method

**Participants.** Participants in the first study were part of a larger study examining the impact of stressful life experiences on low-income urban youth from seven urban public schools with high percentages of low-income students (90%). Students were classified as low income based on eligibility for free or reduced school lunch programs. Six hundred seventy-one African American adolescents participated in the larger study. The sample in the present study included all youth for whom there were complete data on measures examining coping strategies and psychological symptoms.<sup>4</sup> The current sample included 497 adolescents with a mean age of 12.61 years ( $SD = 0.99$ ).<sup>5</sup> Fifty-seven percent of the sample was female. Thirty-seven percent of the participants were

enrolled in the sixth grade, 31% were enrolled in the seventh grade, and 32% were enrolled in the eighth grade. There was a significantly higher proportion of boys in the excluded group than in the final sample,  $\chi^2(1, N = 670) = 4.19, p = .04$ ; however, no differences in age or grade were observed. The adolescents in the final sample used significantly more distracting action coping ( $M = 12.36, SD = 3.40$ ) than the excluded adolescents ( $M = 11.77, SD = 3.31$ ), but no other differences were found.

**Procedure.** Consent forms were distributed to students to take home to parents, and forms were also mailed directly to some parents (at recommendation of school administrators). Parent consent forms described the larger project, the voluntary nature of participation, and the confidentiality of the data collected, and invited parents to contact the researchers if they had questions. School administrators were given the option of selecting "active" or "passive" consent procedures. Administrators for six of the seven schools selected passive consent. Thus, parents were advised that their children would be invited to participate in the project if they did not return the consent form. Students who agreed to participate in the study completed assent forms that described the purpose of the study, the voluntary nature of participation, and methods for ensuring confidentiality. Surveys were administered by clinical psychology doctoral students in school classrooms during regular class time at the convenience of participating teachers. Surveys were read aloud by research assistants, and students were given assistance if they had difficulty understanding any of the questions. The study was conducted in compliance with the university's review board.

**Measures.** Participants completed self-report measures to assess coping strategies and internalizing symptoms.

**Children's Coping Strategies Checklist (CCSC).** Adolescent coping was assessed with the CCSC (Program for Prevention Research, 1999). The CCSC is a 52-item self-report measure of coping strategies in childhood and adolescence. Children are asked to rate the frequency of their use of coping strategies during stressful situations using a 4-point scale (1 = *never*, 2 = *sometimes*, 3 = *often*, 4 = *most of the time*). The 52 items are

<sup>4</sup> Because of a variety of circumstances that occurred in participating schools (e.g., fire drills, students arriving late to class, discipline problems in the classroom), all the measures were not completed by all the students in each participating classroom. The order of the measures was varied to ensure that a single measure was not eliminated in most classrooms. In the present study, analyses were conducted on all African American youth who had complete data on all the measures examined in this study (i.e., measures of coping strategies, interpersonal stressors, and internalizing and externalizing symptomatology).

<sup>5</sup> Most of the participants in the current sample came from three communities located in an impoverished urban area. During the year in which the survey was conducted, this police district (comprising all three communities) had the highest murder rate (102 murders) in the city (C. Erving, personal communication, 1999). Similarly, this district led the city in criminal sexual assault, robbery, and aggravated assault rates. On a self-report measure of stressor frequency (1 = *never occurs* to 5 = *always occurs*), the average score for stress exposure in the sample was 4.22. Specifically, 76% of the sample reported seeing someone carrying a weapon, 63% had seen someone get beat up or mugged, 35% had been involved in a serious accident, and over 20% had been threatened with bodily harm.

categorized into 10 subscales. Results of confirmatory factor analysis of the 10 subscales have suggested that a four-factor model is the best fit for the data (Ayers, Sandler, West, & Roosa, 1996). The four factors are active coping ("You did something to make things better"), distraction ("You listened to music"), avoidance ("You tried to ignore it"), and support-seeking strategies ("You told people how you felt about the problem"). Test-retest reliability coefficients (1 week) for the subscales have ranged from .49 to .73 (Program for Prevention Research, 1999). For the current sample, we conducted a confirmatory factor analysis of the CCSC using maximum likelihood estimation procedures. The test of the four-factor model resulted in an improper solution due to the constraint of an error variance at the lower bound. Alternative models were tested, and a three-factor model, omitting physical release of emotions and placing distracting actions on the avoidant coping factor, was most conceptually sound and resulted in the best fit,  $\chi^2(24) = 27.32, p = .29$ , comparative fit index = .99, standardized root-mean-square residual = .02, and evenly distributed factor loadings. Thus, three factors were used in the current analyses: active coping ( $\alpha = .89$ ), avoidant coping ( $\alpha = .79$ ), and support-seeking coping ( $\alpha = .82$ ).

**Youth Self-Report (YSR).** Internalizing symptoms were assessed with the internalizing subscales of the YSR (Achenbach, 1991; Achenbach & Edelbrock, 1987). The YSR includes 119 behavior items, which the adolescent rates on a 3-point scale as 0 = *not true*, 1 = *somewhat or sometimes true*, 2 = *very true or often true* (during the past 6 months). Normative data for the YSR are based on a nationally representative sample of nonreferred children and adolescents, with separate norms for boys and girls. Reliability and validity are well established for the YSR (Achenbach, 1991). In the current sample, internal consistency reliabilities, as measured by Cronbach's alpha, were .88 for internalizing symptoms.

## Results and Discussion

**Descriptive analyses.** Means and standard deviations for each of the study variables are listed in Table 1. Correlations among each of the study variables also are presented in Table 1.

**Suppression analyses.** Suppression analyses were conducted with latent constructs in structural equation modeling (SEM). Because of measurement error, suppressor effects may be underestimated in regression models (Cheung & Lau, 2008; Maassen & Bakker, 2001). One general advantage of SEM is that analyses with latent variables are corrected for measurement error due to the use of multiple indicators for a latent variable, and consequently the intercorrelations among latent constructs are estimated higher

than in models with only observed variables (Maassen & Bakker, 2001). In the current analyses, nine of the CCSC subscales were used as indicator variables for the latent constructs of active coping, avoidant coping, and support-seeking coping.

To assess for suppression, we tested models whereby each latent coping variable was allowed to predict internalizing behavior. Results, presented in Table 2, demonstrated that when active coping alone predicted internalizing behavior, the standardized path coefficient was significant and positive (.15,  $p < .01$ ). Analogous findings occurred for avoidant coping (.27,  $p < .001$ ) and support-seeking coping (.11,  $p < .05$ ). These findings contrast with findings for the full model that includes all three coping constructs predicting internalizing behavior. In the full model, the sign of the regression coefficient for active coping became negative. Further, the significant standardized coefficient for active coping became negative ( $-.70, p < .05$ ), the coefficient for avoidant coping increased from .27 to .80 ( $p < .01$ ), and the coefficient for support-seeking coping became nonsignificant. These findings suggest a net suppression effect for active coping whereby it enhances the effect of avoidant coping on internalizing behavior. The increases in the coefficients for both active and avoidant coping suggest that in addition to a net suppression effect for active coping, a cooperative suppression effect between active and avoidant coping may be occurring. In other words, active and avoidant coping may be mutually enhancing each other's effect on internalizing behavior. We conducted a Sobel test using the unstandardized coefficients to determine the significance of these suppression effects. Results indicated that the suppression effect of active coping on avoidant coping was significant ( $z = 2.55, p < .05$ ; i.e., the increase of the path coefficient for avoidant coping coefficients was significant), but the suppression effect of avoidant coping on active coping was not significant. Therefore, SEM analysis indicated that a net (Cohen et al., 2003) or negative (Conger, 1974) suppression effect for active coping on avoidant coping was occurring in the model predicting internalizing behavior.

The analyses reported above were supplemented by SEM analyses that included all possible pairs of the coping variables in models predicting internalizing symptoms. The analyses using pairs of coping variables demonstrated a significant net suppression effect for active coping on avoidant coping, consistent with the findings above. Additionally, the analyses that paired support-seeking coping and avoidant coping (without active coping) revealed a significant net suppression effect for support-seeking coping on avoidant coping ( $z = 3.08, p < .01$ ).

Table 1  
*Descriptive Statistics and Intercorrelations Among Study Variables for Example 1*

Variable	<i>M</i>	<i>SD</i>	1	2	3	4
1. Active coping	2.61	0.57	—			
2. Avoidant coping	2.60	0.56	.73**	—		
3. Social support coping	2.21	0.66	.70**	.55**	—	
4. YSR internalizing scale	14.33	9.58	.12**	.22**	.10*	—

*Note.* YSR = Youth Self-Report.  
\*  $p < .05$ . \*\*  $p < .01$ .

Table 2  
Standardized Beta Coefficients of Coping Strategies on  
Internalizing Behavior in Example 1

Variable	$\beta$ alone	$\beta$ with all coping variables
Active coping	.15**	-.70*
Avoidant coping	.27***	.80***
Support-seeking coping	.11*	.15

Note.  $N = 497$ .

\* Significant suppression effect (i.e., the increase of the path coefficient was statistically significant).

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

## Example 2: Predicting Depression and Anxiety From Situational Coping

### Method

**Participants.** Participants in the second study were 268 African American adolescents in the sixth through eighth grade (mean age = 12.90 years,  $SD = 1.27$ ) from five public schools in urban areas. Adolescents were participants in a study designed to assess coping in low-income African American youth. Public schools were selected for participation based on high percentages of low-income students, as determined by eligibility for free or reduced school lunch programs, and African American students.<sup>6</sup> Of the 268 participants, 56% were female. Thirty-seven percent of the participants were enrolled in the sixth grade (45% female), 25% were enrolled in the seventh grade (66% female), and 38% were enrolled in the eighth grade (61% female).

**Procedure.** A recruitment letter and consent form were sent home with all sixth- through eighth-grade students attending participating schools. Active parental consent and youth assent were obtained for all participants in the study. Surveys were administered by clinical psychology doctoral students in school classrooms during regular class time at the convenience of participating teachers. Surveys were read aloud, and participants were given assistance if they had difficulty understanding questions. Each youth who participated was given a movie pass (good for one free movie) for completion of the survey packet. The study was conducted in compliance with the university's review board.

**Measures.** Participants completed self-report measures to assess coping strategies and internalizing symptoms.

**How I Coped Under Pressure Scale (HICUPS).** Participants' use of coping strategies was assessed with the HICUPS–Revision 1 (HICUPS-R1; Program for Prevention Research, 1999). The HICUPS is a 54-item self-report measure of coping strategies that children may use when they have a problem. In the prompt for the measure, youth are asked to identify and write a problem and complete the HICUPS-R1 to indicate their coping responses to the problem. Then youth are asked to rate the frequency of their use of coping strategies during stressful situations using a 4-point scale (1 = *never* to 4 = *most of the time*). The 54 items are categorized into four factors: active coping strategies (“You did something to make things better”), distraction (“You listened to music”), avoidance (“You tried to ignore it”), and support-seeking strategies (“You told people how you felt about the problem”; Ayers et al., 1996). For the current sample, we conducted a confirmatory factor

analysis of the HICUPS using maximum likelihood estimation procedures. The test of the four-factor model resulted in an improper solution due to the constraint of an error variance at the lower bound. Alternative models were tested, and a three-factor model, omitting the distraction coping factor, was most conceptually sound and resulted in the best fit,  $\chi^2(41) = 145.63$ ,  $p = .00$ , comparative fit index = .93, standardized root-mean-square residual = .05, and evenly distributed factor loadings. For the current sample, alpha reliability coefficients of the factor scores were as follows: .92 for active coping, .87 for support-seeking coping, and .78 for avoidant coping.

**Children's Depression Inventory and Revised Children's Manifest Anxiety Scale.** Depressive symptoms were assessed with the Children's Depression Inventory (Kovacs, 1992). The Children's Depression Inventory is a widely used measure of youth depression consisting of 27 items. Each item contains three sentences, and respondents are asked to choose the sentence that most closely describes them over the past 2 weeks (0 indicates an absence of symptoms, 1 indicates mild symptoms, and 2 indicates definite symptoms). The 27 items can be combined to provide an overall depression score. Reliability and validity of the Children's Depression Inventory are well established (Kovacs, 1992). Cronbach's alpha for the overall depression score in the current sample was .85.

Anxiety symptoms were assessed with the Revised Children's Manifest Anxiety Scale (Reynolds & Richmond, 1997). The scale contains 37 sentences to which the respondent is asked to respond “yes” or “no.” Of the 37 items, 28 items measure anxiety symptoms, and nine assess the extent to which the youth is responding in a socially desirable manner. The items on the measure can be combined to provide an overall anxiety score. The Revised Children's Manifest Anxiety Scale is a widely used measure of anxiety, and the reliability and validity of the measure have been well established (Reynolds & Richmond, 1997). Cronbach's alpha for the overall anxiety score in the current sample was .89.

### Results and Discussion

**Descriptive analyses.** Means and standard deviations for each of the study variables are listed in Table 3. Correlations among each of the study variables also are presented in Table 3. Correlations among all four coping variables were significant and positive.

**Suppression analyses.** To test for suppressor effects, we conducted SEM analyses for models in which each of the four latent coping variables was allowed to predict depression and anxiety. Eight of the subscales of the HICUPS were used as indicator variables for the latent constructs of active coping, avoidant cop-

<sup>6</sup> The participants in the current sample came from four impoverished urban communities. On a self-report inventory of interpersonal, school, family, and community stressors, almost 80% of the sample reported experiencing at least 10 stressors in a 3-month period on a self-report stress inventory, and 50% of the sample reported experiencing more than 20 stressors. Over 70% reported hearing gunshots in their community, 57% reported seeing someone carrying a weapon, 46% reported that someone close to them was shot or attacked, 38% reported seeing someone get shot or attacked, 57% reported that a close family member had died, and 61% had been threatened with physical attack by others.

Table 3  
*Descriptive Statistics and Intercorrelations Among Study Variables for Example 2*

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
1. Active coping	2.59	0.59	—					
2. Avoidant coping	2.63	0.76	.55**	—				
3. Support-seeking coping	2.33	0.81	.59**	.26**	—			
4. Distraction coping	2.39	0.62	.46**	.28**	.32**	—		
5. Anxiety	37.59	8.82	-.05	.14*	.05	-.03	—	
6. Depression	9.53	7.14	-.08	.06	.03	.09	.52**	—

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

ing, and support-seeking coping. Results, presented in Table 4, demonstrated that active coping alone was unrelated to depression ( $-.06$ , *ns*) or anxiety ( $-.07$ , *ns*), and support-seeking coping alone was unrelated to depression ( $.08$ , *ns*) or anxiety ( $.02$ , *ns*). Avoidant coping was unrelated to depression ( $.13$ , *ns*), but was significantly associated with anxiety ( $.20$ ,  $p < .05$ ). These findings contrast with results of analyses testing the full model that includes all three coping constructs predicting depression and anxiety. In the full model, active coping became a significant predictor of depression ( $-2.36$ ,  $p < .01$ ) and anxiety ( $-2.77$ ,  $p < .01$ ),<sup>7</sup> and the values of the standardized coefficients increased. Support-seeking coping also became a significant predictor of depression ( $.72$ ,  $p < .01$ ) and anxiety ( $.72$ ,  $p < .01$ ), with an increase in the values of the standardized coefficients. Also, avoidant coping became a significant predictor of depression ( $1.98$ ,  $p < .01$ ), and the value of the standardized coefficients for avoidant coping on anxiety increased ( $2.41$ ,  $p < .01$ ). The findings suggested a classical suppression effect (Cohen et al., 2003; Horst, 1941) for active coping and support-seeking coping on avoidant coping in the prediction of anxiety and depression.

To assess these effects further, we supplemented the analyses above by SEM analyses that included pairs of the coping variables in models predicting anxiety and depression. These models were contrasted with the models mentioned above in which each coping variable alone predicted the outcome variables. The model in which active coping and avoidant coping predicted depression and anxiety showed that active coping significantly predicted anxiety ( $-2.55$ ,  $p < .01$ ) and depression ( $-2.02$ ,  $p < .01$ ), and that avoidant coping significantly predicted anxiety ( $2.63$ ,  $p < .01$ ) and depression ( $2.08$ ,  $p < .01$ ). The findings also suggested that the standardized coefficients for the coping variables in these models increased from the models that included each coping variable alone. Results of the Sobel test indicated that the suppression effects of active coping on avoidant coping were significant for anxiety ( $z = 2.19$ ,  $p = .02$ ) but not depression ( $z = 1.64$ ,  $p = .10$ ; i.e., the increase of the path coefficients for avoidant coping was significant). However, the suppression effect of avoidant coping on active coping was not significant.

The model in which support-seeking and avoidant coping predicted depression and anxiety showed that support-seeking coping was not a significant predictor of anxiety ( $-.08$ , *ns*) or depression ( $.02$ , *ns*), and that avoidant coping significantly predicted anxiety ( $.23$ ,  $p < .01$ ) but not depression ( $.13$ , *ns*). The findings also suggested that the standardized coefficients for the coping variables in these models increased from the models that included each coping variable alone. A Sobel test was conducted to determine the

significance of these suppression effects. Results indicated that the suppression effects of support-seeking coping on avoidant coping, as well as the suppression effects of avoidant coping on support-seeking coping, were not significant. No suppression effects were observed for the models examining active coping and support-seeking coping.

### General Discussion

The purpose of the current study was to demonstrate the replicability of statistical suppressor effects in coping research with African American adolescents from economically disadvantaged communities. In Example 1, SEM analyses indicated a net or negative suppression effect, with active coping enhancing the positive association between avoidant coping and internalizing symptoms. Support-seeking coping also showed a suppression effect on avoidant coping, but only when active coping was not included in the prediction model. In Example 2, the results demonstrated that a classical suppression effect was occurring, with both active coping and support-seeking coping enhancing the association between avoidant coping and anxiety. The pattern of findings in these two samples suggests that the significant positive effects of avoidant coping on internalizing symptoms are contingent upon partialing out the effects of active coping and, in some situations, support-seeking coping. These findings are consistent with existing research, which has shown that more active, problem-focused strategies may serve as suppressors for more avoidant coping strategies (Orr, 1986; Sandler et al., 1994; Suvak et al., 2002). Taken together, these findings suggest that more active, problem-focused coping strategies may serve a dual role in coping research of explaining criterion variance in some situations and suppressing variance that is criterion irrelevant in other situations (Tzelgov & Henik, 1991).

As noted previously, active coping and avoidant coping are conceptually distinct strategies with divergent psychosocial consequences, but the results of these analyses suggest that the two strategies may share a common feature. One interpretation of this finding is that active coping removes the variance associated with more "active" forms of avoidance (e.g., staying away from people or places that could be dangerous). This interpretation is consistent

<sup>7</sup> It should be noted that some of the standardized coefficients presented in this section exceed the value of 1.0. Although unusual, standardized coefficients greater than 1.0 are statistically possible and typically signal severe multicollinearity (Deegan, 1978) and/or suppression effects (Wuenssch, 2008a, 2008b).

Table 4  
*Standardized Beta Coefficients of Coping Strategies on Anxiety and Depression in Example 2*

Variable	Depression		Anxiety	
	$\beta$ alone	$\beta$ with all coping variables	$\beta$ alone	$\beta$ with all coping variables
Active coping	-.06	-2.36**	-.07	-2.77**
Avoidant coping	.13	1.98**	.20*	2.41*** <sup>a</sup>
Support-seeking coping	.08	.72**	.02	.72**

*Note.*  $N = 268$ . Some of the standardized coefficients presented in this table exceed the value of 1.0. Although unusual, standardized coefficients greater than 1.0 are statistically possible and typically signal severe multicollinearity (Deegan, 1978) and/or suppression effects (Wuensch, 2008a, 2008b). SEM = structural equation modeling.

<sup>a</sup> Significant suppression effect (i.e., the increase of the path coefficient was statistically significant).

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

with the finding that active and avoidant strategies are especially related in the present sample and suggests that particular avoidant strategies might reflect effective problem solving in the context of urban poverty. Similarly, support-seeking strategies represent active efforts to obtain instrumental or emotional support. Support-seeking coping, therefore, may also remove the variance reflecting more active approaches from variance in avoidance strategies. The variance that is not shared between avoidant coping and approach or support-seeking coping may reflect passive strategies of coping, such as cognitive attempts to repress or block out the stressor, and these passive strategies may predict higher levels of anxiety and depression in low-income African American youth. Research with adults has shown that more passive cognitive avoidance strategies predict higher levels of depression and anxiety (Blalock & Joiner, 2000; Dunmore, Clark, & Ehlers, 2001; Ottenbreit & Dobson, 2004).

### Implications for Coping Research: Toward a More Comprehensive Model of Avoidant Coping

The construct of avoidance coping includes both what an individual does behaviorally to avoid a stressor or avoid dealing with a stressor directly (e.g., stay away from threatening people or places, help others deal with a similar problem, engage in emotional discharge to vent negative emotions) and what cognitive strategies an individual uses to avoid thinking about situations or problems (e.g., denial of the stressor's occurrence, minimizing the seriousness of a stressor; Moos & Schaefer, 1993; Ottenbreit & Dobson, 2004). Behavioral avoidance strategies can be conceptualized as active attempts to avoid a stressor or release tension or negative emotions, whereas cognitive avoidance strategies represent more passive responses to stress (Blalock & Joiner, 2000). These findings highlight the need to examine both behavioral avoidance and passive or cognitive avoidance in coping research, particularly research with urban African American youth. In support of this assertion, recent factor-analytic studies with adults suggest that avoidance coping is better represented by a more complex two-factor model of behavioral avoidance and cognitive avoidance rather than a single avoidance coping factor (Blalock & Joiner, 2000; Moos & Schaefer, 1993; Ottenbreit & Dobson, 2004).

Very little research with children and adolescents has examined both cognitive avoidance and behavioral avoidance. One exception

found that cognitive avoidance strategies were used more often with family problems than with peer or school problems, whereas no situation differences were found for behavioral avoidance (Brodzinsky, Elias, Steiger, & Simon, 1992). A study with low-income African American adolescents demonstrated that cognitive avoidance strategies were associated with depression in boys, whereas behavioral avoidance strategies were associated with depression in girls (Gaylord-Harden, Campbell, & Elmore, 2009). Further, behavioral avoidance strategies have shown a protective-reactive effect on depression and anxiety in African American female adolescents, with behavioral avoidance coping showing an advantage, but less so when perceived stress was high than low (Gaylord-Harden, 2009). In contrast, African American youth in ethnographic studies reported that the most frequently used and recommended means of coping with exposure to violence was behavioral avoidance (Howard, Kaljee, & Jackson, 2002). Additional research is needed to understand when these two strategies are employed and when they are effective. This research is critical with African American youth from low-income communities because some findings with these youth show *protective* functions for avoidant coping at high levels of uncontrollable stress (Dempsey et al., 2000; Edlynn et al., 2008; Grant et al., 2000). However, a consideration of the suppressor effects in the current study implies there may be components of avoidant coping that are adaptive and components that are maladaptive.

To distinguish adequately between adaptive avoidant coping (e.g., wisely removing oneself from a dangerous situation) and maladaptive avoidant coping (e.g., excessive anxious avoidance), future research must assess the use of avoidant coping across various stressors (e.g., cross-situational coping) to determine when and at what levels it is adaptive. Further, Tolan et al. (2002) discussed the importance of longitudinal studies to understand the long-term implications of coping strategies such as avoidant coping. Specifically, the use of avoidant coping may be adaptive for certain stressors, but the long-term use of avoidant coping may cause adolescents to continue using avoidant coping when it is no longer needed or for stressors that require more active coping (e.g., academic problems). Thus, longitudinal, cross-situational studies are warranted to examine more complex conceptualizations of avoidant coping.



### Implications for Coping Research: Toward a Multidimensional Model of Coping Strategies

The current findings also imply that to fully understand how a particular coping strategy affects outcomes in youth, it should be considered in combination with other coping strategies. Research with urban ethnic minority youth demonstrates that coping strategies viewed as conceptually distinct from one another show various patterns of co-occurrence (Gaylord-Harden et al., 2008; Rasmussen, Aber, & Bhana, 2004; Tolan et al., 2002). Further, these patterns differ in levels of adaptiveness (Tolan et al., 2002). Therefore, it may be more important to examine patterns of coping across strategies rather than attempt to determine which strategies are most salient. Person-based statistical approaches, such as cluster analysis or latent profile analysis, can provide insight into natural patterns of behavior (Masten, 1999). In person-based analysis, the relevant aspect of the analysis is the profile of scores and not the impact of an individual variable (Bergman & Magnusson, 1997). A second, newer approach involves developing a continuum of coping. With this approach, coping strategies are not categorized by type, but rather they are coded for effectiveness based on an in-depth coding system. Thus, each level of effectiveness includes combinations of coping strategies, resulting in a multidimensional ranking of coping strategies from least adaptive to most adaptive (Tolan et al., 2002). With this novel approach with a sample of African American and Latino urban adolescent boys, greater community violence exposure was associated with violent behavior for youth who used a combination of maladaptive coping strategies (i.e., substance use, confrontation, and isolation; Brady, Gorman-Smith, Henry, & Tolan, 2008).

### Recommendations for Managing Suppressor Effects in Coping Research

Strong, significant, positive intercorrelations among coping variables are frequently detected and indicate that suppressor situations may show a high likelihood of occurrence in coping research. The potential problems associated with these effects have led to attempts to correct this issue statistically. For example, the use of relative scores, generated by dividing the respondent's score

on a subscale of coping by the respondent's total score across all subscales of coping, has been proposed to reflect the proportion of the total coping efforts attributable to a single type of coping (Vitaliano, Maiuro, Russo, & Becker, 1987). However, the use of relative scores violates assumptions of multivariate statistics, namely linear independence (Lapp & Collins, 1993). A second strategy used in personality research on shame and guilt involves saving the standardized residual coefficients from regression equations predicting shame from guilt and guilt from shame to create a guilt-free shame scale and a shame-free guilt scale, and found that these variables showed stronger associations to outcomes than the original raw scores (Tangney and Dearing, 2002). Although this method may provide a clearer understanding of the unique contributions of coping strategies to outcomes, it does not prevent the occurrence of suppressor situations, nor does it allow the field to learn from them.

In light of these conclusions, coping research may be better served by the acceptance of possible suppressor situations, rather than attempts to "correct" situations that may lead to suppressor effects. The identification of suppression situations can help to clarify how variables contribute to prediction, whether their main role is to explain some of the variance in outcomes or to remove variance that is not relevant to the outcome (Tzelgov & Henik, 1991). Thus, based on recommendations by Maassen and Bakker (2001), Pedhazur (1997), and Tzelgov and Henik (1991), suggestions are presented for coping researchers in Table 5.

### Implications for Clinical Interventions

The findings of the current study have important implications for clinical intervention, especially for youth exposed to high levels of stress, such as the current samples. On the one hand, the positive associations found between avoidance and psychological symptoms highlight the need for effective intervention for youth exposed to severe and chronic stressors. Several studies have suggested that stressors of greater severity are especially likely to elicit avoidant responses, and that avoidance, in turn, mediates or explains the relation between stress and psychological problems (for a review, see Grant et al., 2006). On the other hand, the

Table 5  
*Recommendations for Managing Suppressor Effects in Coping Research*

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- When multiple coping variables are being used simultaneously to predict or explain outcomes, minimal reliance should be placed on zero-order correlations among coping variables and outcomes.
  - When examining the results of regression analysis or structural equation modeling analysis that include multiple coping variables, standardized regression coefficients of coping variables should be examined for increases and/or sign changes that may signal suppression.
  - If a potential suppression situation is detected, the statistical significance of the effect should be determined using methods outlined in MacKinnon et al. (2002).
  - For significant suppression situations, if the suppressor variable and the explanatory variable are *substantively* related (e.g., direct problem solving and information seeking), one or both of the variables can be dropped for model parsimony. However, when the variables are substantively different for theoretical reasons (e.g., approach and avoidant), both variables should be retained.
  - If a coping strategy is identified as a suppressor variable and its association to the outcome changes direction (i.e., net or negative suppression) to a direction that is opposite to predictions, this effect should not be explained as a direct effect that is inconsistent with predicted effects. Because a variable will appear as a suppressor only in combination with other predictor variables, when interpreting the results, the suppressor and these other variables should be considered in combination and should be interpreted in a theoretically meaningful way.
  - Because suppression effects may be underestimated in regression models, the use of structural equation modeling analysis should also be used when testing for suppression effects.
-

suppression findings highlight the complexity of associations among coping variables, suggesting that at least in some contexts, the distinctions among coping variables may not be those that have been conceptually derived from studies with other samples. They highlight the complex ways in which coping strategies are interrelated and provide suggestions for improving the sophistication of coping interventions.

First, a more comprehensive model of avoidant coping should be considered in intervention work. Particularly, the findings suggest the need to consider incorporating behavioral avoidance into the active, problem-solving scripts that are taught in most cognitive behavioral interventions, as behavioral avoidance may be adaptive for populations in urban, economically disadvantaged communities. The overwhelming majority of coping intervention programs for children and adolescents focus on enhancing active, problem-focused coping strategies. However, for youth exposed to high levels of uncontrollable or dangerous stressors, active coping may not be conducive. For example, in response to exposure to violence, active coping strategies may include confronting perpetrators or becoming involved in the violence, which then escalates into greater risk (Grant et al. 2000; Rasmussen et al., 2004). However, programs that focus on coping with dangerous stressors, such as exposure to violence, can include behavioral avoidance strategies, such as avoiding risky individuals or situations, escaping dangerous situations, venting negative emotions, and engaging in alternative activities. These strategies may help minimize exposure to risk factors and provide a means for managing negative emotional responses to stress.

Second, the results support the assertion that coping is a multidimensional construct, as evidenced by the interdependence of active, avoidant, and support-seeking coping in the current samples. In this regard, the target goal of intervention efforts may be to determine the optimal profile of coping strategies in response to urban stress (Skinner & Wellborn, 1997), rather than the adaptiveness of particular coping strategies in isolation. The few existing person-based coping studies with ethnic minority youth suggest that resourceful groups, or youth who use high levels of multiple strategies, show better outcomes than groups using other patterns of coping (e.g., Tolan et al., 2002). Thus, interventions with low-income African American youth may benefit from trading breadth for depth. Specifically, it may be more important to ensure that youth have an arsenal of coping strategies available, rather than focus on in-depth instruction of one or two types of coping strategies.

Further, once optimal coping profiles are identified, youth should be instructed on how coping strategies may be used together. Although active, support-seeking and avoidance coping may all be important when responding to stress, the key to optimal coping responses may not lie in the orientation of the strategy (i.e., toward or away from a stressor), but in the organization and flexibility of coping responses (Skinner & Wellborn, 1997). For example, an individual could be encouraged to use avoidant or support-seeking coping strategies to alleviate anxiety and help the individual engage resources necessary to use active coping strategies to manage a stressor directly (Herman-Stahl, Stemmler, & Petersen, 1995).

Similarly, because urban African American youth employ multiple types of coping strategies, as evidenced by high intercorrelations between coping strategies in the current study, interven-

tions may benefit from including components that teach youth how to match coping strategies to particular stressors. A review of coping research showed an increase in the specificity of coping strategies to particular stressors during adolescence (Fields & Prinz, 1997), suggesting an enhanced capacity to match coping to stress as youth get older (Compas et al., 2001). Thus, adolescence may be an optimal time to include instruction on how to match coping strategies to stressors, with particular emphasis on controllable and uncontrollable stressors. There are existing coping interventions that consider matching coping efforts to the controllability of the stressor essential, such as the Primary and Secondary Control Enhancement Training for youth depression (Weisz et al., 1999) and the family-based cognitive intervention designed by Compas et al. (2009) to help youth cope with parental depression. Using similar strategies to assist youth in coping with urban stressors may be critical for enhancing intervention efforts with African American youth from low-income communities. If such modifications are not implemented, youth may become frustrated, discouraged, or disillusioned by the results of their efforts to control uncontrollable situations (e.g., violence in their community). As a result, they may not attempt those strategies even when faced with stressors they could control. Alternatively, youth may disengage from therapy on the assumption that clinicians are completely out of touch with their environment. Such factors may contribute to the higher rates of dissatisfaction with therapy that have been reported by African Americans (Diala et al., 2000).

### Limitations, Strengths, and Conclusions

The results of the current study should be considered in light of potential limitations. First, the two samples of African American adolescents were from families and urban communities experiencing high levels of poverty and associated stressors, limiting the generalizability of the findings to a subgroup of youth. Second, the measurement of coping in the current study may have implications for drawing broad conclusions about the relationships between coping and outcomes. Specifically, because youth in the current study were allowed to report on how they coped with any stressor of their choosing, conclusions about the associations between coping and internalizing symptoms may be less reliable than if all participants reported on their coping behaviors for the same stressor. Also, all measures were collected via adolescent report, which may increase the likelihood of shared method variance. Although survey measures were counterbalanced across schools in the situational coping example (Example 2), it appears quite reasonable that symptom levels may have influenced the selection and utility of coping strategies. As follows, the cross-sectional design of the study limits the ability to infer causal relations between coping and psychological outcomes and to understand potential reciprocal associations.

Notwithstanding the limitations, the current study adds important information to existing research. First, it is one of only a few studies that have purposefully examined suppressor effects and used appropriate tests to determine the statistical significance of the effects. Second, the replication of suppression effects across dispositional and situational measures of coping in two independent samples is a key strength of the study and increases confidence that true suppression occurred (Collins & Schmidt, 1997; Maassen & Bakker, 2001). Finally, the current study adds to a

burgeoning body of literature that assesses coping patterns within, rather than between, ethnic groups, providing information about heterogeneity of coping within African American youth. Although researchers may be familiar with the concept of statistical suppression in behavioral research, the current study provides empirical evidence for suppression in coping research with youth and generates valuable questions for future research. Additional familiarity with explicit tests of suppressor effects and subsequent implications for theory and practice may advance understanding of how coping behaviors are associated with psychological symptoms and enhance intervention efforts for adolescents facing multiple challenges to healthy functioning.

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Received September 15, 2009

Revision received April 21, 2010

Accepted April 21, 2010 ■

### Call for Nominations

The Publications and Communications (P&C) Board of the American Psychological Association has opened nominations for the editorships of **Journal of Experimental Psychology: Learning, Memory, and Cognition**; **Professional Psychology: Research and Practice**; **Psychology and Aging**; **Psychology, Public Policy, and Law**; and **School Psychology Quarterly** for the years 2013–2018. Randi C. Martin, PhD, Michael C. Roberts, PhD, Ronald Roesch, PhD, and Randy W. Kamphaus, PhD, respectively, are the incumbent editors.

Candidates should be members of APA and should be available to start receiving manuscripts in early 2012 to prepare for issues published in 2013. Please note that the P&C Board encourages participation by members of underrepresented groups in the publication process and would particularly welcome such nominees. Self-nominations are also encouraged.

Search chairs have been appointed as follows:

- **Journal of Experimental Psychology: Learning, Memory, and Cognition**, Leah Light, PhD, and Valerie Reyna, PhD
- **Professional Psychology: Research and Practice**, Bob Frank, PhD, and Lillian Comas-Diaz, PhD
- **Psychology and Aging**, Leah Light, PhD
- **Psychology, Public Policy, and Law**, Peter Ornstein, PhD, and Brad Hesse, PhD
- **School Psychology Quarterly**, Neal Schmitt, PhD, and Jennifer Crocker, PhD

Candidates should be nominated by accessing APA's EditorQuest site on the Web. Using your Web browser, go to <http://editorquest.apa.org>. On the Home menu on the left, find "Guests." Next, click on the link "Submit a Nomination," enter your nominee's information, and click "Submit."

Prepared statements of one page or less in support of a nominee can also be submitted by e-mail to Sarah Wiederkehr, P&C Board Search Liaison, at [swiederkehr@apa.org](mailto:swiederkehr@apa.org).

Deadline for accepting nominations is January 10, 2011, when reviews will begin.