THE INFLUENCE OF GENDER AND EMOTIONAL VERSUS INSTRUMENTAL SUPPORT ON CARDIOVASCULAR REACTIVITY IN AFRICAN–AMERICAN ADOLESCENTS[1]

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ABSTRACT

Research suggests that females seek out, prefer, and are more receptive to emotional support (encouragement), and that males seek out, prefer, and are more receptive to instrumental support (problem-solving). Thus, we hypothesized that boys would show lower blood pressure (BP) reactivity in response to instrumental than emotional or no support, and that girls would show lower BP reactivity in response to emotional than instrumental or no support. Forty-eight healthy African–American adolescents (50% males) participated in a role play conflict task and were randomized to receive either emotional, instrumental, or no support (presence only) from a confederate. Boys showed lower systolic blood pressure (SBP) reactivity in the instrumental than in the emotional or no support conditions and lower recovery SBP as compared to boys in the emotional or no support conditions. A similar pattern of results was demonstrated for diastolic blood pressure (DBP) reactivity. Girls, however, did not demonstrate lower BP reactivity in response to emotional as compared to instrumental support. These findings suggest that instrumental and emotional support differentially influence cardiovascular (CV) reactivity in African–American boys versus girls.

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INTRODUCTION

Low levels of social support have been associated with poor physical health and increased risk for morbidity and mortality. For example, a number of prospective studies have demonstrated a higher mortality rate among individuals who have fewer supportive social ties (1–6). Lack of social support has also been independently associated with a poorer cardiac prognosis (7–10) and an increased incidence of cardiovascular (CV) disease (11). These studies provide evidence for the important role of social support in the development or incidence of CV disease.

Several prospective studies have also demonstrated that increased CV reactivity is predictive of morbid CV events (12,13). Several recent literature reviews have indicated that African–American children show greater reactivity to stress than do Caucasian children (14,15). Furthermore, some evidence suggests that social support may be associated with reduced CV reactivity in African–American youth. For example, in a study of healthy children ages 6 to 8 years (57 Whites, 30 African–Americans), high levels of family social support were associated with reduced CV reactivity (16). The present study expands on past research by examining the effects of gender and type of social support (instrumental, emotional, or no support) on CV reactivity in a healthy African–American adolescent population.

Social support has been identified as a protective factor for a wide variety of health outcomes, including blood pressure (BP), CV reactivity, and coronary heart disease. There are two hypothesized pathways in which social support may influence the effect of stress on health outcomes (17). First, significant others may encourage the adoption of healthy behaviors and support appropriate utilization of medical services. Second, strong social ties may have a direct effect on neuroendocrine and cardiovascular functioning (18,19). As research on social support has become more sophisticated, examining the relationship between different types of support and health outcomes has become more important. A decade ago, Barrera (20) proposed that the term "social support" was too global and should be replaced by more precise concepts such as social embeddedness (social networks), perceived social support (evaluation of support), and enacted support (assistance provided). Barrera has shown that these three categories of social support have differential associations with psychological adjustment. Barrera's definitions mirror distinctions made between structure (social networks) and function (types of resources provided) (21) in the social support literature. To date, investigations examining how differential functions of support relate to health have been scarce, and the vast majority of research has focused on the role of emotional support.

The present study expands on previous research by examining two different functions of enacted social support, emotional and

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instrumental. According to Barrera (20), emotional support is defined as providing encouragement and enhancement of self-worth. In contrast, instrumental support is defined as the provision of tangible resources for solving practical problems. Although different types of support have been identified in the literature (20) and examined through correlational studies (22,23), comparisons of the effects of emotional versus instrumental support on health outcomes (i.e. BP and CV reactivity) have not previously been manipulated in a laboratory setting.

The effects of different types of enacted support may differ across gender, in part, because preferences for and evaluations of support differ for males and females. For example, previous research indicates that social support experiences vary markedly across gender groups (24,25). Past research on support-seeking behavior has demonstrated gender differences in emotional versus instrumental support. Specifically, females seek out, prefer, and are more receptive to emotional support, and males seek out, prefer, and are more receptive to instrumental support. For example, Kliewer, Lepore, Broquet, and Zuba (26) demonstrated that boys sought more instrumental support, while girls sought more emotional support in trying to solve interpersonal and social problems over a community help-line. In another study, Bryant (27) analyzed sources of neighborhood support and found that girls were more likely than boys to engage in intimate talks with peers and adults. Carver, Scheier, and Weintraub (28) also reported that college women who had experienced a recent stressful event were more likely to seek social support of an emotional nature than were college-aged men. Furthermore, in a review article, Nadler (29) concluded that women more frequently sought help for personal and emotional problems, whereas men sought help more often for instrumental–informational reasons. Additional studies among college students have shown that women, but not men, perceive emotional support as helpful in dealing with interpersonal problems (30). These gender differences in support-seeking patterns may be attributable to the fact that the social relationships of females are more dyadic, exclusive, intimate, and self-disclosing than those of males (31). The present study focuses on two types of enacted social support, emotional and instrumental, in understanding gender differences in BP reactivity.

In general, a number of investigators have shown beneficial effects of social support on CV reactivity. For example, Kamarck, Manuck, and Jennings (19) found that during a mental stress task women who had a friend present showed lower systolic blood pressure (SBP) and heart rate (HR) reactivity than women in the alone condition. Gerin, Milner, Chawla, and Pickering (32) also reported lower BP and HR reactivity to mental stress for women when they were with their roommates than when they were alone. Kamarck, Annunziato, and Amateau (33) demonstrated that under a high (versus low) threat condition, women showed lower SBP reactivity when they were with a friend as compared to women who were alone. In another study (18), female undergraduates who were engaged in a controversial discussion showed significantly smaller increases in CV reactivity when a confederate defended the participant's position as compared to participants who had no support provided.

In contrast to the above studies, several studies have shown a negative impact of support on CV reactivity. Allen, Blascovish, Tomaka, and Kelsy (34) found that women who had a friend present had higher SBP and HR reactivity to mental stress than women who were alone or with a pet. Edens, Larkin, and Abel (35) studied 60 college women who participated in a mental stress task while either alone, with a friend, or with a stranger (half of the supporters were also provided with emotional support by touching). There was no significant effect for support condition in this study and participants who were touched actually showed greater increases in BP reactivity than those who were not touched.

To the best of our knowledge, only a few studies have examined the role of gender and social support on CV reactivity. In a study by Sheffield and Carroll (36), when males and females were divided on level of support felt during a mental stress task, males who rated their partners as evaluative (pryingness) showed lower HR reactivity than those who rated their partners as nonevaluative. Lepore, Allen, and Evans (37) reported that both males and females exhibited smaller increases in SBP reactivity to a speech task when given support by a confederate than did participants who were alone; thus, gender did not moderate the effects of social support on CV reactivity. In a recent correlational study, Wilson, Kliewer, and Bayer (38) found that African–American boys showed significantly higher BP reactivity than African–American girls who reported receiving high levels of emotional support from family members.

The inconsistent findings reported above may be due to several factors. First, the majority of previous research on social support and CV reactivity has focused on the effects of emotional rather than instrumental support and little attention has been given to gender differences (37–39). Furthermore, CV reactivity tasks have primarily focused on mental stress tasks rather than interpersonal stress tasks which may be more like real life situations. Previous research has also been limited in that its primary focus has been on White females rather than on males or other racial groups. The purpose of the present study was to examine the effects of gender and type of social support (emotional, instrumental, or no support—manipulated in a laboratory setting) on BP reactivity in a healthy African–American adolescent population. Specifically, we hypothesized based on previous research that boys would show lower BP reactivity in response to instrumental than emotional or no support. In contrast, we predicted that girls would show lower BP reactivity in response to emotional than instrumental or no support.

METHODS

Participants

The study protocol was approved by the Medical College of Virginia/Virginia Commonwealth University Institutional Review Board. Written informed consent was obtained from the parent and the child prior to participation. Forty-eight African–American adolescents, ages 13 to 16 years old, were recruited from schools, churches, and through local recreation centers. Each child participated in a health screening conducted by a trained assistant. The screening included a BP assessment, a urine specimen (to rule out hematuria, glucosuria, or proteinuria), and a measure of height (cm) and weight (kg). Only normotensive adolescents who did not have preexisting CV or chronic disease and who were not currently taking medications (including oral contraceptives) were allowed to participate in the study. All participants were within 25% of ideal weight for their height. Two females (one in the emotional condition and one in the instrumental condition) whose perceptions of their support condition did not match their assigned support condition were eliminated from all of the reported data analyses. Demographic characteristics for the final sample are presented in Table 1, separated by males and females.

Demographic and Background Information

Parents provided information regarding their child's family history of essential hypertension (EH) and related illnesses. Parents indicated in a yes/no format whether anyone in the child's immediate family (father, mother, brother, sister, grandparents, uncles, and aunts) had EH, or was taking medication for it; had died of a stroke or a heart attack before the age of 50; or had died suddenly due to natural causes. To assess parental level of education, respondents indicated the highest level of education that the head of the household (the person who financially supports the family) had completed ranging from 1 (*less than eighth grade*) to 6 (*graduate school*) (Table 1). Parents also indicated their total annual family income on a scale ranging from 1 (*less than $10,000*), 2 (*$10,000 to $19,999*), 3 (*$20,000 to $29,999*), 4 (*$30,000 to $39,999*), 5 (*$40,000 to $49,999*), 6 (*$50,000 to $59,999*), and 7 (*$60,000 or more*).

Procedure

After the health screening, participants were seated alone in a relaxed position with their legs uncrossed for a 5-minute rest period. This rest period is consistent with other previously published studies in young African-Americans (40,41). A Dinamap apparatus was used to obtain six BP and HR measurements during each of three phases: a resting phase, a stress phase, and a recovery phase. BP and HR measures were obtained by a trained technician as outlined by the Second Task Force on Blood Pressure Control in Children (42). Specifically, the appropriate cuff size was determined by assuring that the cuff was long enough to encircle the circumference of the arm completely and wide enough to cover approximately 75% of the upper arm between the axilla and the antecubital fossa. The subject's arm was then placed on a table at the level of the heart in a relaxed position. At the conclusion of the resting BP and HR assessment, each participant participated in a role play task (see description below). Briefly, the role play task involved having the adolescent respond to six tape-recorded descriptions of stressful interpersonal situations modified for adolescents from a protocol developed by Smith and colleagues (43). Participants were randomly assigned to receive during the role play task either emotional support (encouragement), instrumental support (problem-solving), or no support (presence only) from a confederate. After the role play task, participants completed manipulation check measures and measures of task realism, difficulty, and involvement.

Role Play Task

In the present study, we utilized a role conflict task as the laboratory stressor. Confederates were instructed to provide either problem-solving or emotion-focused support in order to reduce the effects of the stress task on CV reactivity responses. The role play task contained both instrumental or problem-solving elements, as well as emotional elements in order to be functionally related to the support conditions. In terms of the instrumental elements, the task required that subjects resolve the conflict by coming up with feasible solutions to specific conflicts. With respect to the emotion-focused elements, subjects were antagonized by the experimenter who played the role of sibling, peer, parent, or teacher.

After the six baseline BP and HR measurements were taken, the experimenter excused herself and returned with a female African–American confederate who was introduced to the participant as someone who would be sitting in to learn about how adolescents respond to stressful situations (see Social Support Manipulation). Only female confederates were selected as the support givers in the present study, because past research indicates that they are effective at providing support for both women and men (44,45). The role play task involved having the adolescent respond to six tape-recorded descriptions of stressful interpersonal situations. Participants first engaged in a practice role play which involved being accused of stealing a compact disc by a store security guard. After the practice role play, the task began. The six role play topics were presented in the following order and included talking to a sibling about snooping through their private belongings; confronting a peer who failed to follow through on a promise; talking to a teacher about receiving a bad grade; talking to parents about not being allowed to attend a concert; responding to accusations of cheating on a test; and confronting a peer who spread rumors about the participant's family. Participants were required to talk for 1.5 minutes about each of the six situations during which the experimenter responded to them in an antagonistic fashion, acting in the role of sibling, peer, parent, or teacher. The experimenter made no more than three comments to the participant during each role play task. Sixty seconds into each of the role plays the experimenter activated the Dinamap apparatus to obtain one BP and HR reading. Once the reading was completed participants were told they could stop talking. At the conclusion of the role play task participants remained quietly seated while a 5-minute recovery phase was completed. Six recovery BP measurements were taken with 30 seconds between the measurements. Average baseline, stress, and recovery SBP, DBP, and HR measures were calculated. BP and HR values from the six role play tasks were averaged to obtain the absolute stress value. BP reactivity was defined as a change score from baseline to stress. Recovery scores were computed as a change score from baseline to recovery. The baseline and recovery methodology used in the present study was based on previous established procedures used in similar study populations (40,41).

TABLE 1
Demographic Characteristics and Baseline Measurements

Variables	Males	Females
Sample Size	24	22
Age (yrs)	15 ± 1	15 ± 1
Quetelet Index (kg/m^2)	22 ± 3	22 ± 3
Annual Family Income	45,000 ± 20,000	39,000 ± 19,574
Married Parents	55%	57%
Family History		
Essential Hypertension (+)	73%	67%
Stroke (+)	5%	5%
Sudden Death (+)	14%	5%
Heart Attack (+)	9%	15%
Parental Education		
Less than 8th Grade	0%	5%
Some High School	9%	5%
High School Graduate	32%	19%
Some College	18%	38%
College Graduate	27%	19%
Graduate School	14%	14%

All p values = ns; Values are expressed as Means ± SD.

Social Support Manipulation

All confederates were female, African–American, graduate or undergraduate psychology students. Each of the confederates was trained by the first author. Trainees were required to complete seven role plays for each of the support conditions (instrumental, emotional, and no support). In each condition, feedback was given

as to the appropriateness of the responses, tone of voice, facial expressions, posture, and other nonverbal cues. Videotapes were taken during each of the experimental sessions in order to assure that the experimenters and confederates were performing as intended. The second author was responsible for observing the videotapes and providing feedback to the research assistants on their performance.

Instrumental Support Condition: Initial participant–confederate contact was identical for all of the support conditions. In each condition, the confederate was brought into the room and introduced to the participant. The confederate would greet the participant, shake his or her hand, and take a seat in a chair positioned to form a triangle between the participant, the experimenter, and the confederate. Each member of the triad was approximately 4 feet away from the other two persons.

Once the confederate was seated, the experimenter explained to the participant that the confederate was taking a class on adolescents and social situations and would offer help with the role plays if needed. A script of responses was provided to the confederate for each of the role play topics. The confederate provided no more than two to three problem-solving responses during each of the role plays. The experimenter played each scenario on the tape recorder and the participant was signaled to respond once the recording ended. If the participant did not respond in a timely manner (within 10 to 15 seconds), the confederate would offer a helpful suggestion such as, "you could tell your friend that you're counting on them not to let you down," or "you could ask the teacher what to do to improve your grade next time," or "you could ask your sibling to respect your belongings and to ask before taking something." If the participant responded in a timely manner, then the confederate would offer a suggestion after the participant had finished his or her response. All of the confederate's responses were given as options rather than directives. The experimenter did not prompt the participant until both the participant and confederate had each given one response. After the final scenario was completed, the experimenter thanked the confederate for sitting in and excused her from the room.

Emotional Support Condition: The confederate was introduced to participants using the identical procedure outlined in the Instrumental Support Condition. A set script of responses was provided to the confederate for each of the role play topics. The confederate provided no more than two to three encouraging or validating responses during each of the role plays. If the participant did not respond in a timely manner (within 10 to 15 seconds), the confederate would offer a response acknowledging the difficulty of the task such as, "this is really hard but you can do it." If the participant did respond in a timely manner, then the confederate responded with a reassuring statement such as, "this is really hard but you are coming up with good answers," or "I'd be convinced if somebody said that to me," or "you are doing a good job." The experimenter did not prompt the participant until both the participant and confederate had each given one response. After the final scenario was completed, the experimenter thanked the confederate for sitting in and excused her from the room.

No Support Condition: The confederate in this condition was introduced to participants as someone who was taking a class on adolescents and social situations who would be observing the role play task. The confederate did not offer verbal or nonverbal support in this condition. The confederate kept eye contact with the participant to a minimum and maintained neutral facial expressions throughout the entire role play task. After completing the final scenario, the experimenter thanked the confederate for sitting in and excused her from the room.

Manipulation Check Questions

Six items were used to assess participants' perceptions of the social support manipulation with a Likert scale ranging from 1 (*not at all*) to 7 (*very much*). Three items assessed the extent to which participants perceived the confederate as providing them with instrumental support (e.g. specific suggestions for solving the task, information for completing the role plays, or assistance in coming up with responses to the situation). The mean of these three items was used to form an index of perceived instrumental support. Three items also assessed the extent to which subjects perceived the confederate as providing them with emotional support (e.g. provisions of encouragement, caring, and positive comments). The mean of these three items was used to form an index of perceived emotional support. Three additional items assessed the potential iatrogenic effects of the social support manipulation with the same Likert scale described above. Participants were also asked whether it would have mattered if the confederate was a male or female, and if so, why. A final question assessed whether participants felt in general that the confederate was more encouraging (emotional) or more specifically helpful (instrumental) during the role play task.

RESULTS

Manipulation Check Analyses

One-way analyses of variance (ANOVAs) were performed with support condition (instrumental, emotional, no support) as the independent variable and responses to the manipulation check questions as the dependent variables. When group differences emerged, these were followed with Least Significant Difference posthoc tests. As expected, participants in the instrumental support condition ($M = 5.04$, $SD = 1.37$) reported receiving greater levels of instrumental support than participants in the emotional ($M = 2.82$, $SD = 1.36$) or no support ($M = 1.19$, $SD = 0.60$) conditions, $F(2, 43) = 43.11$, $p < .0001$. Participants in the emotional support condition ($M = 6.36$, $SD = 0.78$) reported receiving greater levels of emotional support than participants in the instrumental ($M = 3.29$, $SD = 1.94$) or no support ($M = 1.35$, $SD = 0.71$) conditions, $F(2, 43) = 61.22$, $p < .0001$. The manipulation checks were also analyzed separated by gender group and revealed the same pattern of results described above for both boys and girls.

There were no significant differences in the perceived iatrogenic effects across the support conditions. Overall, participants reported that the confederate did not provide comments that got in the way of completing the task ($M = 1.26$, $SD = 0.91$), that made the participant feel less competent ($M = 1.52$, $SD = 1.26$), or that made the participant nervous ($M = 2.37$, $SD = 1.72$). One additional Likert-type item asked how much the participant enjoyed having the confederate present during the role play task. Participants in the no support condition ($M = 3.50$, $SD = 1.83$) reported less enjoyment than participants in either the instrumental ($M = 5.07$, $SD = 2.12$) or emotional support ($M = 5.40$, $SD = 1.30$) conditions, $F(2, 43) = 5.07$, $p < .01$.

Four females and one male indicated that gender of the confederate did matter to them. All five of these participants said they would feel more comfortable with a female rather than male confederate. Overall, the majority of participants (94%) perceived their support condition correctly. Two females who did not

TABLE 2
Cardiovascular Measures During Baseline, Stress, and Recovery Periods

Test Period	Total Sample	Males	Females
Baseline			
Systolic BP (mmHg)**	107 ± 10	108 ± 10	105 ± 9
Diastolic BP (mmHg)**	58 ± 6	57 ± 6	60 ± 5
Heart Rate (bpm)**	71 ± 10	67 ± 10	75 ± 10
Stress Task			
Systolic BP (mmHg)	123 ± 14	124 ± 16	122 ± 10
Diastolic BP (mmHg)	73 ± 10	71 ± 11	74 ± 7
Heart Rate (bpm)	76 ± 11	71 ± 9	81 ± 10
Recovery			
Systolic BP (mmHg)*	111 ± 10	111 ± 11	110 ± 9
Diastolic BP (mmHg)*	61 ± 6	59 ± 7	63 ± 5
Heart Rate (bpm)*	71 ± 11	66 ± 10	75 ± 9

* $p < .05$ (stress task > recovery); ** $p < .001$ (stress task > baseline); Values are express as means ± S.D.

perceive their condition correctly were eliminated from the analyses, as indicated earlier.

Additional analyses indicated that there were no differences across the major dependent variables when analyzed across confederates. Thus, although some of the confederates were slightly younger than others (undergraduate versus graduate students) this factor did not seem to influence the outcome measures in this study.

Role Play Stress Task

Repeated measures ANOVAs were used to determine if mean levels of SBP, DBP, and HR increased across baseline, stress, and recovery time periods. Table 2 shows the mean and standard deviations for SBP, DBP, and HR values for the entire sample and separated by gender. There were significant time effects for SBP, $F(2, 43) = 85.5, p < .001$; DBP, $F(2, 43) = 76.31, p < .001$; and HR, $F(2, 43) = 18.93, p < .001$, indicating significant increases in all three measures from baseline to stress time periods. There was also a significant decrease in SBP, DBP, and HR from stress to recovery ($p < .05$ for all). There were no significant effects for gender, indicating the magnitude of change in BP and HR measures were equivalent for males and females. Table 3 depicts the absolute and change scores for SBP and DBP measures taken during each of the six role plays. The magnitude of increase in SBP and DBP measures was substantial (range 13–17 mm Hg) and was consistent across all six of the role play tasks.

Gender, Social Support, and CV Reactivity

Planned comparisons were performed to evaluate the hypotheses that boys in the instrumental support condition would show lower CV reactivity than boys in the emotional or no support conditions and girls in the emotional support condition would show lower CV reactivity than girls in the instrumental or no support conditions. For each planned comparison, change in BP or HR from baseline to stress was the dependent measure. Baseline BP or HR values were controlled in these analyses.

Figure 1 shows the adjusted means for SBP reactivity across support and gender groups. Planned comparisons demonstrated that boys in the instrumental support condition showed lower SBP reactivity (adjusted $M = 10.28$, $SD = 8.38$) than boys in the emotional (adjusted $M = 19.43$, $SD = 10.43$), $t(15) = 2.25$, $p < .03$, or no support conditions (adjusted $M = 18.32$, $SD = 8.48$), $t(15) = 1.98$, $p < .05$. There were no significant effects for girls

TABLE 3
Systolic (SBP) and Diastolic (DBP) Blood Pressure Measures for Each Role Play Topic

Role Play Topic	Absolute SBP	Delta SBP	Absolute DBP	Delta DBP
Sibling Snoops	123 ± 17	+16 ± 11	74 ± 11	+16 ± 10
Poor Grade on Test	124 ± 18	+17 ± 12	72 ± 11	+13 ± 10
Parent Refuse Concert	124 ± 14	+17 ± 9	73 ± 10	+15 ± 8
Peer Broke Promise	123 ± 14	+17 ± 8	73 ± 12	+14 ± 10
Accused of Cheating	123 ± 15	+16 ± 11	72 ± 10	+13 ± 8
Classmate Tells Rumors	123 ± 15	+16 ± 10	73 ± 11	+14 ± 9

Delta blood pressure values were calculated by subtracting the average baseline BP value from the BP measurement obtained during the specific role play topic.

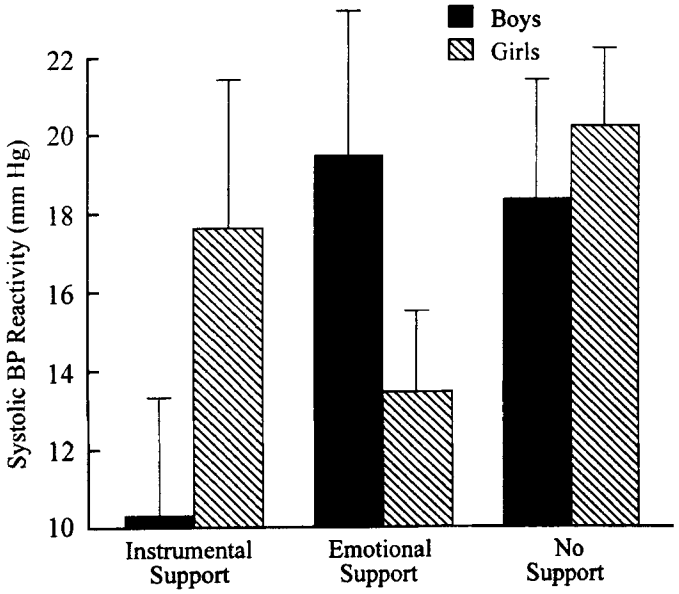

FIGURE 1: Adjusted mean systolic BP reactivity values for boys and girls in the instrumental, emotional, and no support conditions.

(Instrumental—adjusted $M = 17.66$, $SD = 9.92$; Emotional—adjusted $M = 13.46$, $SD = 5.42$; No support—adjusted $M = 20.19$, $SD = 5.53$). The adjusted means for DBP reactivity are shown in Figure 2. Planned comparisons revealed a marginally significant effect indicating that boys in the instrumental support condition showed lower DBP reactivity (adjusted $M = 11.56$, $SD = 6.88$) than boys in the emotional support condition (adjusted $M = 18.92$, $SD = 11.13$), $t(15) = 1.83$, $p = .07$ (No support—adjusted $M = 13.87$, $SD = 5.11$). Again, no effects were significant for girls (Instrumental—adjusted $M = 12.17$, $SD = 6.56$; Emotional—adjusted $M = 12.39$, $SD = 4.64$; No support—adjusted $M = 16.57$, $SD = 9.65$). There were no significant differences across the support conditions for HR reactivity in males or females.

Planned comparisons were also performed to evaluate the hypotheses that boys in the instrumental support condition would show lower recovery scores than boys in the emotional or no support conditions and girls in the emotional support condition would show lower recovery scores than girls in the instrumental or no support conditions. Figure 3 shows the adjusted means for SBP recovery across support and gender groups. Boys in the instrumental support condition demonstrated lower SBP recovery scores

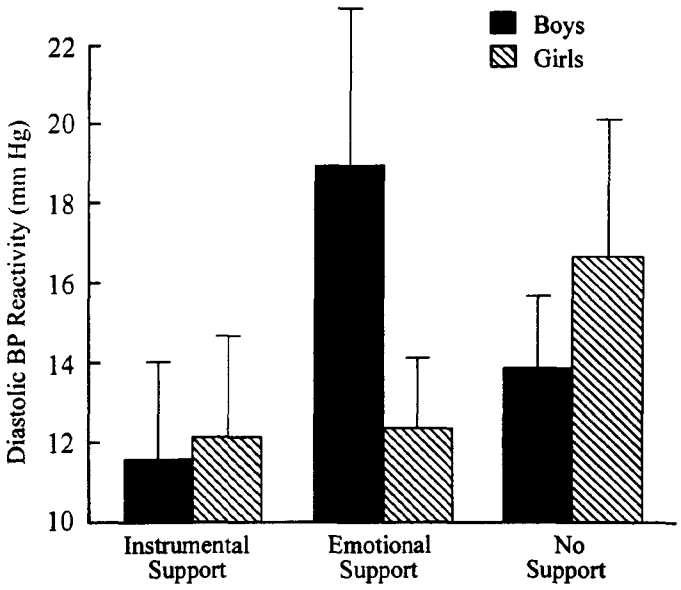

FIGURE 2: Adjusted mean diastolic BP reactivity values for boys and girls in the instrumental, emotional, and no support conditions.

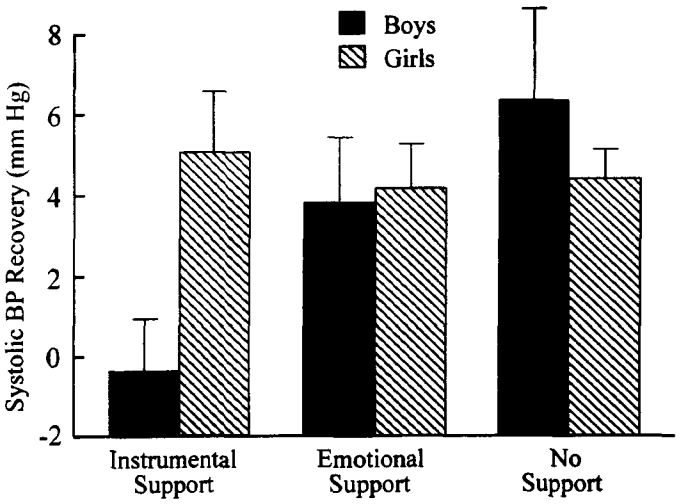

FIGURE 3: Adjusted systolic recovery values for boys and girls in the instrumental, emotional, and no support conditions.

(adjusted $M = 0.40$, $SD = 3.74$) than boys in the no support condition (adjusted $M = 6.36$, $SD = 6.51$), $t(15) = 3.16$, $p < .01$, and marginally lower SBP recovery scores than boys in the emotional support condition (adjusted $M = 3.82$, $SD = 4.51$), $t(15) = 1.96$, $p = .06$. There were no significant effects for girls (Instrumental—adjusted $M = 5.09$, $SD = 4.44$; Emotional—adjusted $M = 4.18$, $SD = 3.00$; No support—adjusted $M = 4.38$, $SD = 2.01$). Analyses based on DBP and HR recovery scores revealed no significant group differences.

Additional Analyses

A series of analyses was conducted to determine whether participants' perceptions of the role play task and confederate could explain any of the effects described above. Boys in the emotional support condition did not perceive the task as more realistic or difficult than boys in the instrumental condition. They also reported enjoying the confederate to the same extent, and both groups reported no iatrogenic effects of the confederate (i.e. the confederate did not make them feel less competent, less able to complete the task, or more nervous). Boys in the emotional support condition also did not report being more tired, tense, nervous, or caring about the task more than males in the instrumental support condition (all t values < 1.10). However, boys in the emotional support condition did report putting more effort into the task than boys in the instrumental or no support conditions $t(14) = 2.66$, $p < .03$, ($M = 18 \pm 2$ versus 14 ± 3 versus 15 ± 2, respectively). Boys in the emotional support condition also reported being marginally more involved in the task relative to those in the instrumental condition $t(14) = 1.93$, $p = .07$, ($M = 4 \pm 1$ versus 3 ± 1, respectively). In contrast, girls reported similar levels of effort (Instrumental—$M = 14.60 \pm 2.23$, Emotional—$M = 14.42 \pm 4.39$; No support—$M = 15.37 \pm 2.66$) and involvement (Instrumental—$M = 4.15 \pm 0.61$; Emotional—$M = 3.28 \pm 1.49$; No support—$M = 3.25 \pm 1.38$) across the three support conditions.

Analyses of covariance were used to determine if controlling for task effort or involvement accounted for the difference in SBP reactivity for males in the instrumental versus emotional support conditions. When task involvement was controlled, the effect of support remained significant, $F(1, 15) = 3.31$, $p < .05$, one-tailed. When task effort was controlled, the effect of support was no longer significant, $F(1, 15) = 0.51$, $p = .53$. This finding suggests that effort expended on the task did account for the differential effect of support on SBP reactivity in males.

DISCUSSION

The results of the present study demonstrated that boys and girls showed equivalent increases in BP reactivity to a role play task developed specifically for an adolescent population. As predicted, African–American boys showed lower BP reactivity in response to instrumental support than to emotional or no support. In addition, African–American boys showed lower SBP recovery values in response to instrumental support as compared to emotional or no support conditions. However, there were no significant differences across the support conditions for African–American girls.

The finding that African–American boys showed more positive BP outcomes to instrumental than emotional support expands on past literature. Wilson, Kliewer, and Bayer (38) found that African–American boys who reported receiving high levels of emotional support from family members had significantly higher SBP and DBP reactivity than African–American girls who reported high levels of emotional support. Furthermore, African–American boys who reported having high levels of emotional support demonstrated higher SBP and DBP reactivity relative to African–American boys who reported having low levels of emotional support. In the Wilson et al. (38) study, no measure of instrumental support was included and social support was not directly manipulated. Thus, the present study expands on this past work by demonstrating that instrumental support was more beneficial to African–American boys than emotional support in reducing CV reactivity in this population. Consistent with this finding, Shell and Eisenberg (46) demonstrated that instrumental (or direct) support did not result in feelings of threat, low perceived control, or high dependency in boys. These results have important theoretical implications. Specifically, future research should make theoretically clearer distinctions between emotional and instrumental support in examining gender differences in health outcomes.

The gender differences in CV reactivity and social support in the present study may be due to differing socialization processes of

African–American boys and girls. Boys may have qualitatively different needs for which emotional-based support is inadequate in helping them cope with stressful situations. For example, African–American boys experience more violence and more life-threatening situations than African–American girls (47) and thus may have greater needs for instrumental support which may assist them in coping with stressful situations. Boys are also socialized such that they receive more task-focused support during early childhood, while girls are encouraged from a young age to express their feelings and to expect more emotional support (24). This explanation is also consistent with the literature on support-seeking behavior which indicates that boys are more likely to seek out instrumental than emotional support in times of need (26–30,37). In contrast to the experience of men, past literature indicates that women report receiving more emotional support from their children and friends than do men (48–50). Among adolescent populations, Copeland and Hess (51) also have shown that girls report engaging in social relationships as a way of coping with life change more frequently than boys, who tend to rely on stress reduction activities and diversions.

African–American boys may interpret some forms of support—such as emotional support—as negative (52). Although boys in the emotional support condition did not rate the confederate more negatively than those in the other support conditions, they did show greater cognitive effort during the task. Furthermore, the significant differences that were obtained for social support conditions for boys were eliminated when task-related effort was controlled. This finding suggests that greater cognitive effort mediated the effect of social support on CV reactivity for boys. In the present study, emotional support may have increased feelings of stress in boys, and thus, more effort may have been required to solve the role play under these conditions. Because boys are traditionally encouraged to be independent (53), they may experience reactance to being placed in a dependent position (54,55), such as having to rely on emotional support during a stressful task. Consistent with this interpretation, Smith and colleagues have also demonstrated that husbands show greater CV reactivity than wives when placed in stressful situations that require exerting influence and control (56,57). Taken together, the work by Smith et al. and the results of the present study suggest that males may show greater CV reactivity than females under certain stressful social conditions because of an increased desire to exert effort and demonstrate control.

The lack of BP findings for girls in the present study is consistent with a growing literature which indicates that women may not be differentially affected by different types of social support. For example, Woods and Earp (58) found that perceived availability of instrumental (i.e. help) and emotional (i.e. willingness to listen) support from spouse, family, and friends were not differentially related to depression or the number of physical complications in women following cancer surgery. Seeman, Berkman, Blazer, and Rowe (59) also examined the quantity and functional quality of social support to urinary levels of norepinephrine, epinephrine, and cortisol in a large cohort of older men and women. Results indicated that there were significant associations between social support and neuroendrocrine activity for men but not women. Furthermore, in a study examining sex differences in communication and social problem-solving styles, Ewart and colleagues (60) found that for women, supportive exchanges from spouses were unrelated to BP responses. In general, the studies described above are consistent with the findings in the present study which indicate that girls did not differentially benefit from emotional versus instrumental types of support.

There are several potential limitations to the present study. First, only female African–American confederates were utilized for the support manipulation. Previous research, however, indicates that women are better providers of support than men, largely because they have more empathy (45). Women are also more successful in eliciting disclosure from study participants (44). Thus, female confederates were selected as the support givers in the present study because past research indicates that they are effective at providing support for both women and men. A second potential limitation of the study concerns the generalizability of the study sample. This study included adolescents who were healthy, of normal weight, from primarily middle class families, and who were committed to completing the study protocol. The extent to which this sample of adolescents differs from the general population of African–American adolescents limits the generalizability of the results. Our study participants may have had greater resources (i.e. transportation, higher family income) than the general population of African–American adolescents. Another potential limitation of the present study was the relatively small sample size employed. Although no reliable BP differences were found for girls across support conditions, a larger sample size may have revealed reliable effects. However, a growing literature (as described above) is evolving, which suggests that women may be less affected by differential types of social support.

In conclusion, this is the first study to experimentally manipulate different types of social support provisions, such as instrumental versus emotional support, in the laboratory. Our findings confirm that boys and girls show differential CV reactivity responses to these manipulations. In particular, African–American boys seem to benefit more from instrumental than emotional support. While much of the past literature has focused on White female adult populations, this is the first study to examine these effects in an African–American adolescent population. Further research is needed, however, to replicate these findings in a larger sample of African–American adolescents. In addition, research is needed to better understand the social and cultural factors that may account for these gender differences in social support and CV reactivity.

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