This study compared the effects of 3 home-based exercise promotion programs for African Americans. Sixty, sedentary African-American adults were randomly assigned to either a standard behavioral counseling group (N=22), a culturally sensitive counseling group (N=20), or a physician advice comparison group (N=10). The key study outcomes measured at baseline and after 6 months included cardiorespiratory fitness and physical activity. Acculturation was examined as a moderating variable. Participants in all 3 groups reported significant increases in walking, but significant improvements in fitness were observed only in the 2 intervention groups. Participants in the culturally sensitive intervention reported significantly higher levels of exercise social support compared to members of the other 2 groups. These findings show that home-based exercise counseling programs are effective for improving fitness, yet the addition of culturally tailored components may not be sufficient to produce better outcomes than standard behavioral counseling. (Ethn Dis. 2004;14:548-557)

**Key Words:** Blacks, Ethnology, Exercise Counseling, Physical Fitness

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# INTRODUCTION

African Americans suffer disproportionately from various health problems, including obesity, hypertension, and diabetes. One common, modifiable risk factor for each of these conditions is sedentary lifestyle.1 The Centers for Disease Control and Prevention reported that more than 70% of Americans do not engage in the recommended amount of regular physical activity and that approximately 30% of the population is sedentary.1 Moreover, research consistently shows that African Americans engage in lower levels of leisuretime exercise2-8 and have lower levels of physical fitness<sup>9,10</sup> as compared to Caucasian Americans. However, when occupational physical activity is included, the gap between groups persists at a smaller magnitude.<sup>2,11</sup> Increasing evidence shows that regular physical activity is associated with reduced risk of developing diabetes and hypertension, and can aid in weight loss and changes in body composition.<sup>8,12-16</sup> Several epidemiological studies have found a positive relationship between increased physical activity and improved health in African Americans.<sup>17,18</sup> More recently, physical fitness has been shown to have a stronger association with cardiovascular health outcomes than physical activity.<sup>19</sup>

Several fitness-training studies have been conducted with African-American adults.<sup>10,20–23</sup> In these studies, participants engaged in structured, supervised exercise. These studies used similar interventions with prescriptions for 30 minutes of moderate intensity (55% to 75% HR max) aerobic exercise, completed 3 to 4 days per week. Although these studies showed significant increases in fitness, they were limited in terms of duration (eg,  $\leq 12$  weeks) and by the failure to provide transfer of training from supervised exercise to independent exercise in participants' home environment. Several trials conducted with African Americans have included independent exercise as one element in a multicomponent treatment for the management of obesity or diabetes.<sup>24-31</sup> These studies have generally included self-reports of physical activity but have not assessed changes in cardiorespiratory fitness.31 Thus, there remains a need for longer-term, randomized trials of interventions designed specifically to improve cardiorespiratory fitness in African Americans using home-based physical activity.

Culturally sensitive treatment components have commonly been incorporated into exercise studies with African-American participants.<sup>32–35</sup> Such treatments have been designed to address sociocultural factors that may represent barriers to physical activity changes in African Americans and to facilitate lifestyle change by building on strengths salient to African Americans.36,37 Acculturation presents a significant issue in the tailoring of interventions to African-American participants. Most studies have assumed that all African Americans share the same cultural and world beliefs, and thus, have assumed that culturally sensitive treatments are appropriate for all African Americans. Because the African-American culture is heterogeneous,<sup>38</sup> some aspects of culturally sensitive treatments may be appropriate for certain members of the group, and irrelevant to others. For example, "interdependence" represents an important theme in African-American culture. More "traditional" African-American participants are likely to have a greater sense of interdependence. Therefore, they will likely respond to tailoring that

Increasing evidence shows that regular physical activity is associated with reduced risk of developing diabetes and hypertension, and can aid in weight loss and changes in body composition.<sup>8,12–16</sup>

encourages participants to make behavior changes for the benefit of their community, with less emphasis on individual benefits. However, this type of tailoring may not be as relevant for more "acculturated" African-American participants who are more likely to make health behavior change by focusing mainly on the improvement of their own individual health status. Thus, acculturation may moderate the response of African Americans to culturally sensitive and standard interventions that target health promotion through lifestyle changes.

The primary purpose of the present study was to compare the effects of 3 home-based exercise promotion programs for improving cardiorespiratory fitness in sedentary African-American adults. The effect of the interventions on changes in physical activity was also assessed. Secondary goals of this study included assessing the processes of change variables (acculturation, social support, and self-efficacy), and program satisfaction was measured because few culturally sensitive studies have addressed this issue.

# **METHODS**

### Subjects

The eligibility criteria for study participation included age (30-69 years), sedentary lifestyle (defined as less than one hour per week of leisure-time physical activity over the prior 12 months), and good health status (absence of significant medical illnesses, such as cardiovascular disease, diabetes, uncontrolled hypertension, cancer, and orthopedic problems that would interfere with walking). The University of Florida Institutional Review Board approved the study.

Participants were recruited through a variety of methods. First, community leaders were asked to provide advice about appropriate methods to announce the study in the African-American community. Based on their guidance, several approaches were utilized including securing the support of prominent African-American politicians, pastors, and civic leaders, who publicly endorsed participation in the program. Second, personal presentations were delivered to African-American churches, and social and fraternal organizations. Third, fliers were placed in churches, beauty/barber salons, shopping markets, residential areas, and other places of congregation for African Americans. Fourth, public service announcements were delivered through radio stations and newspaper advertisements, and targeted mass mailings were delivered to areas that were densely populated with African-American families.

After initial contact, all potential participants underwent a telephone prescreening to determine their initial interest and eligibility. Telephone screening interviews were conducted with 457 individuals who classified themselves as African-American. Two hundred fiftysix of these individuals were considered ineligible during the phone screening because they failed to meet the study requirements regarding age, sedentary lifestyle, or absence of significant illnesses. Following a successful phone interview, potential participants were invited to an orientation session in which additional details about the study were provided and informed consent was obtained. Sixty-eight people were excluded following the informational meeting due to a lack of interest or a failure to meet the study's eligibility criteria.

One hundred and thirty-three individuals then underwent 2 medical screening visits that included a physical examination by a medical doctor, laboratory measurements of blood pressure, blood lipids, and blood glucose, and an exercise stress test. Forty-three persons were deemed ineligible due to positive findings from these medical screening procedures. The remaining individuals (N=90) met all of the study's eligibility criteria. Although all 90 African Americans recruited were randomized into a larger home-based exercise trial, 30 of these participants began the program prior to the start of the present study. The remaining 60 persons who constituted the study sample for the present investigation were randomly assigned to one of the following 3 conditions: Standard Behavioral (SB) Exercise Counseling, Culturally-Sensitive (CS) Exercise Counseling, or a Physician Advice (PA)/ Recommended Care Comparison Group.

The 60 participants were recruited over 2 cohorts. The first cohort began in November, and the second cohort began in January. In the first cohort, there were 4 participants in the SB, 7 in the CS, and 2 in the PA. In the second cohort, there were 18 in the SB, 13 in the CS, and 8 in the PA. Eight participants did not start the program. Thus, there were 22 participants assigned to the standard behavioral exercise counseling group, 20 assigned to the culturally sensitive exercise counseling group, and 10 assigned to the physician advice/recommended care comparison group (see Figure 1).

### **Dependent Measures**

#### Cardiorespiratory Fitness

The change in cardiorespiratory fitness from baseline to posttreatment (ie, 6 months) constituted the primary outcome for the study. Maximum oxygen



Fig 1. Randomization flow chart.

capacity (VO<sub>2</sub> max) was assessed using a modified Bruce protocol maximal graded treadmill test. Participants between the ages of 30 to 49 years performed the standard Bruce protocol.<sup>39</sup> Participants between the ages of 50 to 69 years performed a modified Bruce protocol<sup>40</sup> with workloads increasing by approximately 3 metabolic equivalents (METS) every 3 minutes. The test was continued until the participants reached voluntary maximal exertion, until they became symptomatic, or until they developed cardiovascular end points.

# Self-Reported Physical Activity (PAR)

The 7-day physical activity recall<sup>41</sup> was developed as a measure of physical activity. Physical activity is categorized into moderate, hard, or very hard activity. Reliability and validity have been established.<sup>41–43</sup> The change in the number of days of physical activity from baseline to 6-months was used as a dependent variable, because some research has indicated that sedentary adults may not be very accurate or reliable in reporting the intensity levels of their physical activity.<sup>44</sup> In contrast, greater reliable

ability has been shown for self-reports of whether or not an exercise bout was completed on a given day.<sup>44</sup> Moreover, in a highly sedentary population such as this one, where the mean number of days of exercise per week at baseline was less than one, it is clinically meaningful to know the number of days of exercise per week that was achieved by the participants following the intervention period.

# Adherence Measure

### Self-Monitoring Exercise Logs

Participants in the exercise counseling groups (CS and SB groups) were provided with an exercise prescription. Participants were instructed to use selfmonitoring logs to record any walking that was performed to meet the prescription, in bouts  $\geq 10$  minutes. Percent adherence was derived by dividing the total number of days walked by the number of prescribed days of walking. The percent of adherence to the walking prescription and the total number of logs completed were used as measures of adherence.

# Processes of Change Measures

# Acculturation Scale

The African-American Acculturation Scale (AAAS)<sup>45</sup> is a 74-item questionnaire that evaluates the degree to which an individual has knowledge of, is part of, and believes in the African-American culture. The AAAS assesses beliefs in 8 subscales: traditional religious beliefs, family structure, socialization, foods, and health beliefs, preference for African-American items, inter-racial attitudes, and superstitions. Subscale coefficient alphas ranged from .71 (family practices) to .90 (preferences). The authors reported no significant association between socioeconomic status and AAAS scores.45

# Self-Efficacy for Exercise Behaviors Scale (SEES)

Self-efficacy has been shown to be related to changes in exercise beha-

vior46-49 and was assessed as a potential mediator of change in this study. The SEES<sup>50</sup> is a 49-item scale designed to assess an individual's confidence to engage in exercise behaviors. Items were developed from a representative sample of adults (25% African-American) and validated on a sample of college students (90% Caucasian). Factor-analysis reveals 2 factors: resisting relapse and making time for exercise. Test-retest for the factors are both .68, and coefficient alphas are .85 and .83, respectively. The authors report that the measure is significantly correlated with self-reported exercise habits.50

### Sallis Family Support for Exercise Habits Scale (SFSEHS)

Social support has also been shown to be a mediator of change in physical activity.<sup>49</sup> The SFSEHS<sup>51</sup> is a 15-item measure used to assess the level of support for exercise an individual receives from his/her family and friends. Items were developed from a representative sample of adults (25% African-American) and validated on a sample of college students (90% Caucasian). The scale contains 2 factors, participation and involvement, and rewards and punishments. Test-retest reliability was .77 and .55, and coefficient alpha was .91 and .61, respectively.<sup>51</sup>

### Program Satisfaction Questionnaire

This 9-item measure was developed specifically for the study to assess participants' level of satisfaction with the program they received. Six questions pertained to the 4 components of the programs that differed between the groups, including the location of the group sessions, the group leaders, the group members, and the content of the programs. Three other questions addressed the participants' satisfaction with their group size, their level of enjoyment of the group sessions, and their overall satisfaction with the program.

### **Treatment Conditions**

Participants were part of a larger study,52 which required randomization into one of 5 conditions prior to assignment into the current study. The 5 conditions consisted of 4 intervention groups and a physician advice group. The 4 intervention groups differed in the prescription of intensity and frequency of walking. Participants could be prescribed to walk 3 to 4 (M) or 5 to 7 (H) days per week. In addition, they received an intensity prescription of 45%-55% (M) or 65%-75% (H) of their heart rate reserve. Therefore, the four intervention groups were comprised of the 4 intensity-frequency combinations: LM, LH, HM, HH. The duration of exercise for participants in the intervention groups was set at 30 minutes.

After assignment to one of the 5 groups, participants were then randomized into one of the 3 groups of the present study: Physician Advice, Standard Behavioral Exercise Counseling, Culturally Sensitive Exercise Counseling. Participants retained their exercise prescription when they were randomized to the current study, and thus, participants who were originally assigned to the physician advice group remained in this group. Equal numbers of participants were assigned to each of the frequencyintensity combinations between the intervention groups. A description of each of the 3 groups follows:

### Physician Advice (PA)

The PA group was designed to be a minimal treatment corresponding to the recommended exercise guidelines that a healthcare provider would typically give to a sedentary individual. In the first session, the participants met with a physician who provided advice on establishing and maintaining an exercise program. The participants received the American Heart Association's booklet entitled "Exercise and Your Heart,"<sup>53</sup> which provided additional information about exercise and the development of a physical activity regimen consistent with national guidelines. However, the participants in this group were not given a specific exercise recommendation. After this initial meeting, the participants in the PA group were invited to monthly physician-lead meetings in which various health topics were discussed (all health topics were unrelated to altering exercise or eating habits).

### Standard Behavioral Exercise Counseling (SB)

The SB participants received 10 group intervention sessions over 6 months. The sessions were held weekly during Month 1, biweekly during Months 2 to 3, and monthly during Months 4 to 6. The sessions were led by counselors with graduate training in exercise science and/or behavioral science. The African-American participants in the SB condition attended groups with predominantly Caucasian group members and Caucasian group leaders (70% of the participants recruited into the larger walking study were Caucasian). The intervention sessions were held in a university hospital setting. At each session, the participants received standard written materials related to the key behavioral components, including goal setting, written self-monitoring (ie, completion of an exercise log), problem-solving to overcome barriers to adherence, and relapse prevention training to negotiate slips and relapse. The materials were not tailored to address issues of particular concern to African Americans.

### Culturally Sensitive Exercise Counseling (CS)

The CS intervention was identical to the SB program with the exception of 4 key elements: 1) all group members were African-American; 2) the sessions were led by African-American counselors; 3) the sessions were conducted at a site located in the African-American community; and 4) the program included materials that were designed to address socio-cultural concerns of African Americans regarding exercise (eg, ad-

dressed commonly held exercise beliefs, utilized African-American worldview and history, included depictions of African Americans, adorned with Kente cloth print). The first 3 elements were incorporated to enhance the identification among the participants, and between the participants and the group leaders. According to Resnicow,35 these elements are similar to "surface level" cultural tailoring, ones that are more aesthetic, but still important. Resnicow also suggests that "deep level" tailoring (ie, utilizing elements from a culture's history, worldview, and belief system) is necessary, and more important because it taps into socio-cultural elements and leads to meaningful change.35 Therefore, the program materials were designed to incorporate both surface and deep level structures.

# DATA ANALYSIS

Baseline comparisons of demographic and physiological variables were conducted using chi-square tests for dichotomous data and Analysis of Variance (ANOVA) procedures for continuous data. A between-group analysis of changes in fitness was performed using an ANOVA. Similarly, ANOVA was used to assess differences in self-reported physical activity, as measured by the PAR. Age was included as a covariate in both analyses, because of its reported association with changes in fitness. AN-OVAs were also used to examine whether treatment adherence, processes of change, and program satisfaction differed as a function of group assignment. In attempting to avoid a potential type II error, we elected to explore significant ANOVA findings with post-hoc testing using the Least Significant Difference (LSD) method. We recognize that this approach is a liberal one that carries a small risk of an inflated alpha level. However, given the exploratory nature of this pilot study, we believe this is an acceptable risk.

Multivariate linear regressions were used to analyze the acculturation data. An interaction term was included, combining treatment group and acculturation, in order to assess the effect of acculturation, treatment condition, and their interaction on the outcome measures. All variables were entered simultaneously. Only participants who completed both the baseline and 6-month fitness testing were included in the outcome analyses

# RESULTS

# **Baseline Characteristics**

All of the participants classified themselves as African-American. The majority of the participants were female (81%), married (59%), had some college education or greater (92%), were working full-time (86%), and had a personal income of at least \$25,000 per year (75%). ANOVA and chi-square analyses show that there were no differences between the groups on any baseline measures (see Table 1).

### Attendance/Attrition

The rates of attendance were 55%, 61%, and 73% for the standard behavioral, culturally sensitive, and physician advice groups respectively. There was no statistically significant difference detected in the attendance rates.

Over the course of treatment, 4 participants dropped out of the CS treatment (15%) and 5 dropped out of the SB treatment (23%). All PA participants who began the program remained in the study. Reasons for dropping-out included back problems (N=4), lack of time (N=2), and lack of interest (N=3). There was no statistical difference between the intervention groups in the percent of individuals who dropped out  $(\chi^2 = .05; P = .83)$ . In addition, there were no demographic differences between participants who completed the program and those who dropped out. A number of individuals remained in the

treatment program but declined to complete some elements of the post-treatment testing. For example, there were 12 participants who declined to repeat the maximal treadmill test (2 in the PA group, 5 in the SB treatment, and 5 in the CS treatment).

## Outcome Measures

### Fitness Changes

The overall ANCOVA, while controlling for age, was significant, F(2, 31)=4.65; *P*=.018. Post-hoc tests showed significant differences between the SB and PA conditions (*P*=.006) and between the CS and PA groups (*P*=.034). In both cases, the exercise counseling groups had greater changes in fitness in comparison to the PA group (see Table 2). The effect sizes of the SB-PA and CS-PA are 1.07 and .59, respectively.

## Self-Reported Physical Activity

The number of days of exercise completions was derived from the PAR administered at baseline and 6-months (see Table 2). There were no significant differences between the groups at post-treatment, F(2,27)=.39; P=.679. However, within-group analyses showed that the participants in the CS and SB groups significantly increased their days per week of walking from baseline to 6 months (*Ps*<.05).

### Adherence

Participants in both the SB and CS groups completed weekly exercise logs. On average, participants completed 73% of their logs (means=66% and 79% for the SB and CS groups, respectively, P=.435). The exercise self-monitoring data also showed that participants in the CS and SB treatments did not differ significantly in their completion of prescribed exercise (means=59% and 76% for the SB and CS groups, respectively, P=.389).

	Treatment Condition										
-	РА			SB				CS			
Variable	Ν	м	SD	N	М	SD	N	М	SD	F	Р
Age (years: M [SD])	10	47.3	(7.4)	22	44.0	(7.0)	20	45.0	(7.8)	.59	.559
Education (years: M [SD])	9	14.0	(1.4)	22	14.9	(2.1)	20	15.3	(2.2)	.85	.471
	N	0	6	Ν	%		Ν	%	$\chi^2$		Р
Marital status (%)									4.14		.387
Single	0	C	0.0	4	19.0		2	10.0			
Married	6	60	).0	10	47.6		14	70.0			
Divorced/separated	4	40	).0	7	35.0		4	20.0			
Employment (%)									4.83		.305
Full-time	7	77	7.8	18	85.7		18	90.0			
Part-time	1	11	.1	3	14.3		2	10.0			
Retired	1	11	.1	0	0.0		0	0.0			
Income (%)									5.27		.729
<\$24,999	2	25	5.0	5	23.8		5	27.8			
\$25,000-\$49,000	4	50	0.0	6	28.6		8	44.4			
\$50,000-\$74,999	1	12	2.5	7	33.3		2	11.1			
\$75,000-\$99,999	1	12	2.5	2	9.5		3	16.7			
>\$100,000	0	C	0.0	1	4.8		0	0.0			
	Treatment Condition										
	PA				SB			CS			
Variable	N	м	SD	N	м	SD	N	М	SD	F	Р
Days per week of walking	9	1.00	(2.00)	20	.85	(1.60)	19	.47	(1.39)	.4	3.655
Minutes per week of walking	9	21.67	(23.25)	20	18.25	(15.60)	18*	2.22	(5.21)	2.20	.123
Energy expenditure†	9	2423	(423)	20	2854	(558)	19	2725	(434)	2.4	1.101
VO <sub>2</sub> max‡	10	23.44	(7.14)	22	21.49	(4.87)	20	21.19	(4.93)	.6.	.539
BMI	10	30.18	(8.58)	22	32.02	(4.94)	20	31.65	(7.17)	.28	3.762

Table 1. Baseline characteristics of participants according to treatment condition

PA=physician advice group; SB=standard behavioral exercise counseling; CS=culturally sensitive exercise counseling.

\* Data exclude one outlier value.

+ Estimated energy expenditure (derived from PAR) is measured in kcal per day. The number of hours spent in sleep and different activity levels are obtained. Time spent in sleep (1 MET), light (1.5 METs), moderate (4 METs), hard (6 METs), and very hard (10 METs) activities for the past 7 days are multiplied by their respective MET values and then summed. An estimate of total kilocalories of energy expenditure per day is then derived.

<sup>‡</sup> VO₂ measured in mol O₂·min<sup>-1</sup>·kg<sup>-1</sup>.

#### Table 2. Change in VO<sub>2</sub> max by treatment condition

	Treatment Condition								
	P/ (N=	A =8)	S (N=	5B =12)	CS (N=11)				
Variable	м	SD	м	SD	м	SD			
VO <sub>2</sub> max (ml/kg/min)									
Baseline	22.95	(6.37)	21.90	(3.85)	19.99	(4.42)			
6 mo	22.07	(6.60)	23.35	(3.91)	20.45	(3.51)			
Change	88	(2.29)	1.44*	(2.05)	.45*	(2.21)			
	(N=	=8)	(N=	=10)	(N	=8)			
Exercise (days/week)									
Baseline	0.50	(1.41)	0.81	(1.25)	0.25	(0.46)			
6 mo	2.50	(2.67)	3.91	(1.97)	3.00	(2.07)			
Change	2.00	(0.94)	3.10	(0.80)†	2.75	(0.94)†			

PA=physician advice group; SB=standard behavioral exercise counseling; CS=culturally sensitive exercise counseling.

\* P<.05 compared with PA, adjusted for age.

+ Within group differences, Ps<.05.

	Treatment Condition									
Variable	PA			SB			CS			
	N	М	SD	N	м	SD	N	м	SD	
Family participation										
Baseline	6	17.5	(6.5)	8	19.2	(10.2)	8	15.9	(7.9)	
6 mo	6	16.3	(6.4)	8	22.8	(14.1)	8	23.2	(11.1)	
Change	6	-1.2	(4.6)	8	3.5	(13.5)	8	7.4	(5.1)	
Friend participation										
Baseline	6	18.2	(9.7)	7	14.8	(6.0)	7	13.6	(3.4)	
6 mo	6	18.7	(11.6)	7	16.8	(7.0)	7	23.7	(9.5)	
Change	6	0.4	(3.6)	7	2.0	(2.5)	7	10.1*	(8.7)	
Family										
Rewards/punishments										
Baseline	6	3.0	(0.0)	8	3.1	(0.4)	8	4.0	(1.8)	
6 mo	6	3.2	(0.4)	8	4.5	(1.7)	8	3.9	(1.2)	
Change	6	0.2	(0.4)	8	1.4	(1.7)	8	-0.1	(2.2)	
Self-Efficacy										
Baseline	7	44.6	(4.0)	9	46.0	(7.3)	8	46.3	(14.3)	
6 mo	7	43.0	(7.1)	9	44.7	(7.3)	8	48.8	(6.6)	
Change	7	-1.6	(6.3)	9	-1.3	(8.3)	8	2.4	(18.2)	

Table 3.	Change in	psychosocial	variables b	by treatment	condition
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PA=physician advice group; SB=standard behavioral exercise counseling; CS=culturally sensitive exercise counseling.

\* P < .05 when compared to PA and SB.

### Processes of Change Measures

### Acculturation

Acculturation was regressed on attendance, adherence, change in fitness, and percent of prescription walked, in 4 separate regressions. None of the analyses resulted in significant interaction or main effects.

### Self-Efficacy/Social Support

Separate ANOVAs were used to analyze the self-efficacy and social support data. The overall ANOVA for changes in friend support was significant, F(2,20)=5.57; P=.014. Post-hoc tests showed that the CS participants reported significantly greater changes in comparison to participants in both the SB, (P=.049), and PA groups, (P=.027). Although there were no significant between-group differences for family social support or self-efficacy, there were differences in the expected direction. For example, the CS group had greater increases in family support in comparison to the other 2 groups. In addition, selfefficacy increased in the CS group, whereas it decreased in the other 2 groups (see Table 3).

ANOVAs were conducted with each

question to determine if there were any

differences between the groups. Signifi-

cant effects were found for participant

ratings of the group leaders' interest in

assisting them establish a regular exercise

program, F(2,33)=3.45, P=.043. Post-

hoc tests showed that participants in the

CS treatment had higher ratings of their

group leaders' interest compared to par-

ticipants in the PA group (P=.033). In

addition, participants demonstrated sig-

nificant differences in their perception

that the group leaders showed appreci-

ation for the relevant issues facing Af-

rican Americans, F(2,33)=5.8, P=.007.

Post-hoc tests showed that the CS par-

ticipants rated their group leaders as

showing more appreciation than did

both the SB (P=.03) and PA partici-

pants (P=.009).

**Program Satisfaction** 

# DISCUSSION

The present study compared the effectiveness of 3 home-based physical activity promotion programs for African Americans. Over the course of the study, participants in all 3 conditions reported increases in exercise. However, participants in the SB and CS counseling groups demonstrated significantly greater improvements in cardiorespiratory fitness compared to those in the PA condition. Participants in the CS intervention also reported significantly higher levels of social support for exercise compared to members of the other 2 groups. In addition, participants in the CS group were more satisfied with various aspects of their treatment than were members of the other 2 groups. Thus, all 3 programs led to increases in selfreported physical activity, but only the SB and CS treatments demonstrated significant improvements in cardiorespiratory fitness.

The participants in the intervention groups improved their cardiorespiratory

Participants in the SB and CS counseling groups demonstrated significantly greater improvements in cardiorespiratory fitness compared to those in the PA condition.

fitness by 4.5%. This level of increased fitness is comparable to other homebased exercise interventions. For example, King et al<sup>15</sup> reported a 5% increase in VO<sub>2</sub> max after one year in middleaged adults and found that this degree of improvement was associated with beneficial changes in other risk factors for cardiovascular disease.<sup>15</sup>

Despite significant changes in fitness, there were no group differences in physical activity. The most plausible explanation is that of demand characteristics.54-56 Orne54 defines demand characteristics as the subtle, uncontrolled task-orienting cues in an experimental situation that lead participants to act in ways they believe the experimenter wishes. Self-reported physical activity data is subject to demand characteristics.55 These factors likely played more of a role in the PA group than any other, because the participants did not receive an active intervention and were aware that at some level they were being compared to those who had. This explanation is supported by the fact that the fitness levels of the participants in the PA group decreased, despite self-reported increases in physical activity.

The improvements in fitness and in physical activity did not differ significantly between the CS and SB groups. In addition, the rates of attendance and adherence were also equivalent in these groups, and were similar to the rates reported in comparable studies.<sup>52,57,58</sup> Therefore, it is possible that the CS group may not have included cultural elements of sufficient salience to produce a greater effect than the SB intervention. For example, the use of testimonials, or "Testifyin," is a common form of communication (eg, Black Vernacular English) among African Americans. McNabb and colleagues<sup>29,59</sup> used this technique in the "Pathways" diabetes prevention projects and contend that it contributed substantially to the effectiveness of the program. It has also been suggested that saliency can be increased by developing programs from the orientation of the cultural group under study,35 versus making alterations to existing programs (as was the case in the present study). Future studies should seek to use a more diverse set of theoretically derived cultural adaptations.

Despite the lack of differences in fitness and exercise improvements between the exercise counseling groups, the CS treatment resulted in positive changes in some of the processes of change variables. African-American women typically seek a "buddy" when initiating an exercise program.60,61 Therefore, the cultural tailoring (ie, being in groups with similarly minded African-American women) may have made it easier to obtain this kind of support. The tailoring was also likely responsible for the increased satisfaction of the CS group participants with their counselor characteristics. The counselors were the primary form of program delivery and therefore likely communicated much of the salient, "deep level" tailoring (ie, information related to African-American history and worldview). Nonetheless, it is unclear as to which aspects of the cultural tailoring were related to the change in social support and participant satisfaction, suggesting the need for future studies to determine which cultural components are related to successful behavioral change.

Acculturation did not moderate the relationship between the intervention groups and outcome measures. One possibility for the lack of relationships is that there was not enough variation in acculturation between the participants. An examination of the norms for acculturation revealed that most participants in this study were within one standard deviation of the study mean. Thus, the majority of the participants in the present study can be considered "bicultural." By definition, bicultural individuals hold beliefs consistent with both cultures. Consequently, such individuals are receptive to information presented from both a culturally tailored and a standard orientation.

Despite its methodological strengths, including the use of a randomized controlled design, the present study has several limitations. For one, the majority of the participants were highly educated, which may limit generalizability to lesseducated samples. In addition, self-reported data is sometimes susceptible to recall errors<sup>62,63</sup> and demand characteristics.54-56 Nonetheless, in middle-aged adults, self-reported physical activity data have been moderately correlated with objective data derived from heart rate57 and ambulatory activity monitors.41,64 Most importantly, the small sample size limits this study's generalizability and its power to detect betweengroup differences. For example, power was adequate to detect differences in cardiovascular fitness (.74), but was inadequate for days walked per week (.11). Because of the lack of evidence of generalizability, this finding needs to be confirmed through replication studies with adequate power. Therefore, the results of the present study are tentative until replication studies with similar findings are conducted.

To our knowledge, this study represents the first randomized controlled trial in sedentary African-American adults to document the cardiorespiratory benefits of home-based exercise. The study showed that both the culturally sensitive and standard behavioral counseling produced significant improvements in cardiorespiratory fitness that were superior to a physician advice/

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recommended care comparison condition. The results also showed that the culturally sensitive group produced additional, positive changes in social support and participant satisfaction. A replication of these findings is warranted due to the study's small sample size and limited follow-up. Future studies of longer duration should be conducted to evaluate the health benefits associated with improved fitness and to determine the long-term effects of culturally sensitive interventions of greater salience to African Americans.

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- Statistical expertise: Perri
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