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Improving Participation Rates for Women of Color in Health Research: The Role of Group Cohesion

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Abstract

Adherence to physical activity and dietary interventions is a common challenge. Interventions that use group cohesion strategies show promise for increasing adherence, but have not been tested among women of color. The purpose of this study was to determine whether dimensions of group cohesion mediate the association between intervention condition and attendance within a community physical activity program for women of color. African American and Hispanic or Latina women (*N*=310) completed measurements at baseline and post-intervention and participated in a social cohesion intervention to improve physical activity and dietary habits. Women were assigned to a physical activity or fruit and vegetable intervention group. Social and task cohesion was measured using the Physical Activity Group Environment Questionnaire (PAGE-Q). Attendance was recorded at each of six intervention sessions. Women were generally middle-age (*M* age = 46.4 years, *SD*=9.1) and obese (*M* BMI = 34.4 kg/m2, *SD*=7.7). The estimate

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of the mediated effect was significant for all group cohesion constructs, indicating both task constructs—attraction to the group's task (*SE*=0.096, *CI*: −0.599 to −0.221) and group integration around the task (*SE*=0.060, *CI*: −0.092 to −0.328)—and social constructs—attraction to the group's social aspects (*SE*=0.046, *CI*: −0.546 to −0.366) and group integration around social aspects (*SE*=0.046, *CI*: −0.546 to −0.366)—significantly mediated the association between group assignment and attendance. Both task and social constructs are important to improve attendance in health promotion interventions for women of color.

Keywords

Group processes; Mediation; Physical activity; Nutrition; African Americans; Hispanic Americans

Participation in health promoting behaviors is extremely important for populations most vulnerable to health compromising conditions. In particular, physical activity and dietary habits have become national priorities as obesity rates continue to increase, and physical activity has been independently associated with numerous health outcomes (e.g., cancer, heart disease, healthy aging; Haskell et al. 2009). The mid-term report on Healthy People 2010 objectives indicates that there has been little, if any, improvement in overall rates of participation in these health promoting behaviors, and large disparities continue to exist within the population, with women of color among the most vulnerable to poor health behaviors (USDHHS 2000). Despite these low rates, many studies have attempted to improve health behaviors, but often face the challenge of increasing and sustaining attendance in behavior change programs. As attendance decreases, intervention dose decreases, leading to low or no adherence to behavior change regimens (Wilbur et al. 2008).

Within this context of low prevalence and adherence rates across a range of health behaviors, this study focuses on physical activity promotion as a model health behavior. Many interventions and strategies to promote health behaviors like physical activity have been developed (Atienza et al. 2001; Dishman and Buckworth 1996; Eden et al. 2002; Hillsdon et al. 1995; Holtzman et al. 2004; Kahn et al. 2002; King et al. 1998). Many intervention studies have targeted small groups as a vehicle to enhance motivation and change behavior, because they are typically less expensive than one-on-one counseling approaches, have resources that can improve member enjoyment (e.g., a knowledgeable leader, fun classmates), and provide opportunities for social integration (Carron et al. 1988; Estabrooks 2000; Estabrooks et al. 2004; Fox et al. 2000); however there are differences between the content and formats used in group physical activity interventions.

Lewin hypothesized that the motivational core of small group interventions was the development of a sense of group cohesion across members (Lewin et al. 1939). Studies investigating the relationship between group cohesion and physical activity adherence have shown promising results (Paskevich et al. 2001). This work was based primarily upon the conceptual model developed by Carron and associates (1988) who define group cohesion as "a dynamic process reflected by the tendency of a group to stick together and remain united in the pursuit of its instrumental objectives and/or for the satisfaction of member affective needs." The operational model derived from this constitutive definition includes four

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dimensions of group cohesion that include *task* and *social* components, which are further divided into individual attractions to the group and group integration aspects. The resulting dimensions include *individual attractions to the group's task* (ATGT), *individual attractions to the group's social aspect* (ATGS), *group integration around the task* (GIT), and *group integration around social aspects* (GIS) (Carron et al. 1988).

Meta-analysis has demonstrated that physical activity interventions that used strategies to increase group cohesion (across dimensions) were more effective than simply having participants meet and complete exercises together (Burke 2006). An earlier review of studies done in white samples concluded that individuals who held stronger beliefs about the ATGT tended to have higher attendance and were less likely to drop out (Estabrooks 2000). Other research suggests that the relationships among group cohesion elements and participation may vary by individual characteristics. For example, in older adults it appears that ATGS and ATGT may be more likely to predict initial participation while GIT may be more likely to predict longer-term group membership (Estabrooks and Carron 1999). To date, few studies have completed meditational analyses and the mechanisms of effect are relatively unknown.

Physical activity interventions that target group cohesion as a mediator have been under utilized in women of color, even though there are health disparities involving chronic conditions such as diabetes and cardiovascular illness that can be helped by physical activity. African Americans experience the highest prevalence rates for hypertension among the major ethnic groups in the United States (Keenan and Rosendorf 2011) and both African American and Hispanic women experience significantly higher prevalence rates of diabetes than white women (Beckles et al. 2011). In the United States, the emerging minority groups of African American and Hispanic or Latino have many unique features, but they also share commonalities that make them especially suitable for group cohesion interventions. In both of these cultures, there are deep social traditions around family, faith and religion and health (Dodani et al. 2009; Whitt-Glover et al. 2008). Family time is highly valued, and regular rituals focus on attending religious services and religious practices in groups (e.g., *Bible* study groups, church social activities). As well, the concern for good health in the family and as a message during religious services is well documented (Resnicow et al. 2002).

The purpose of this study was to determine whether the dimensions of group cohesion mediated the association between intervention condition and attendance within a community physical activity program for women of color. The study design (described below) included a comparison condition that also received strategies to enhance group cohesion, but relative to changes in dietary habits rather than physical activity. This study targeted both African American and Hispanic/Latino women since these ethnic groups are traditionally underserved with regard to health promotion and are more likely to experience health disparities that can be exacerbated by physical inactivity. We hypothesized that social cohesion would be improved in both groups, but that improvements in task cohesion would be experienced only by participants who received the physical activity intervention. Moreover, it was hypothesized that both social cohesion and task cohesion would mediate the association between study group and attendance for the physical activity intervention,

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but that only social cohesion would mediate the study group—attendance association for the dietary habits intervention.

Method

Health is Power (HIP) was a randomized controlled trial to investigate the efficacy of a social cohesion intervention to increase physical activity and improve dietary habits in African American and Hispanic or Latina women in Houston and Austin, Texas (Lee et al. 2011a, b). The aims of the HIP study were to determine whether a group cohesion intervention to promote physical activity in minority women was more effective for promoting walking adoption in comparison to a group cohesion intervention to promote increased fruit and vegetable consumption. This study provides an excellent opportunity to investigate hypothesized relationships among group cohesion mediators and specific measures of intervention dose.

It was hypothesized that social cohesion (ATGS and GIS) would significantly mediate the association between study group and attendance for both the physical activity and dietary habits groups since the social interactions between groups would not differ. For instance, social cohesion tasks completed by both groups included identifying group roles, working together to do goal setting, and solve barriers. However, as the dietary habits comparison condition targeted a different behavioral task (i.e., changes in eating rather than changes in physical activity) we hypothesized that ATGT and GIT would be significant predictors of attendance at group sessions for the physical activity group alone. The task cohesion aspects of the intervention differed by task (i.e., physical activity or dietary habits) with a goal of increasing cohesion to that specific task. The primary measure of group cohesion used was the Physical Activity Group Environment Questionnaire (PAGE-Q; Estabrooks and Carron 2000). This measure emphasizes cohesion related to physical activity behaviors, but the questions pertaining to task cohesion are more pointed toward physical activity than those pertaining to social cohesion. This is attributable to the nature of each construct, since task cohesion incorporates the particular behavioral task at hand, whereas social cohesion tends to focus on the social interactions over the task at hand. For this reason, it was hypothesized that task cohesion would significantly mediate the association between study group and attendance for the physical activity group only, and not the dietary habits group. Hence, the hypotheses are based not only on the qualitative difference between the behaviors related to physical activity and dietary habits, but also on the measurement of the mediator.

Participants

Between the two sites, 405 African American and Hispanic or Latina women were enrolled in HIP and included in the current study. A power calculation suggests that this sample is large enough to detect mediational effects with a medium effect size of .50 and power greater than 90% using either a difference or product correlational method at alpha = .05. Apparently healthy women between 25 and 60 years of age currently residing in Harris or Travis County, Texas who participated in the HIP project baseline (T1) and post-intervention (T2) health assessments were included in the current study sample.

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Women included in the HIP study met the following inclusionary criteria: 1) African American or Hispanic/ Latina between the ages of 25 and 60 years old, 2) able to read, speak, and write in English, 3) not pregnant or planning to become pregnant within the next 12 months, 4) a Harris or Travis County resident, 5) not planning on moving in the next 12 months, 6) physically inactive or did not do more than 30 min of physical activity per day on 3 or more days per week, 7) no history of medical illness or currently taking medication, 8) attended randomization session and were willing to be randomized to either a physical activity group or a vegetable and fruit group, and 9) available between 5:30 and 8:00 PM on meeting dates. If a woman did not meet criteria number 7, she was allowed to enroll if she obtained a medical waiver from her physician stating that she was able to participate in the HIP project under the physician's supervision. Those who did not meet one or more of the screening criteria, excluding criteria 7, were excluded from the HIP study.

Participants were recruited to the HIP study via the media, brochures, churches and internet communication beginning in June 2006 through July 2007. Physically inactive women between the ages of 25 and 60 years old were invited to participate in the project. The study period spanned 7 months where month 1 involved baseline assessments and randomization and months 2–7 consisted of the intervention period. Women who met inclusionary criteria as assessed by a telephone screening met in person with a researcher to complete a baseline (Time 1 [T1]) health assessment where group cohesion, physical activity, dietary habits and SES questionnaire data were collected. Participants were given a take-home packet at this visit. The take-home packet contained several questionnaires of scientific interest not found in the interviewer-administered survey. The take-home packet was administered during the run-in period. Run-in periods are commonly used in randomized clinical trials to improve retention rates. Women who completed at least three-fourths of the take-home packet questionnaires and returned it at the randomization session were eligible to be randomized.

Intervention

Women attended a randomization session and were randomized to a physical activity or fruit and vegetable intervention. Women met in their groups six times and were exposed to group dynamics teambuilding strategies to promote walking or increase fruit and vegetable consumption. For instance, during the first session participants formed small groups and chose a team name, an undertaking that promotes interaction, creativity, and a sense of team identity (Burke et al. 2005; Carron et al. 2005). Each group was encouraged to identify a team captain, co-captain, secretary, and welcomer; many of these roles alternated weekly to promote involvement of all group members. Fulfilling group roles facilitates participant engagement and personal ownership of the team (Estabrooks 2008; Estabrooks et al. 2005).

Women participated in intervention activities as a team, worked toward a shared goal and supported team members throughout the intervention. Both groups received identical interventions developed to increase task and social cohesion. However, the topic on which the task was based differed: either physical activity or dietary habits. For instance, where the physical activity group did a task cohesion goal-setting activity based on miles that they would walk, the dietary habits group did a task cohesion goal-setting activity based on servings that they would eat. The physical activity group did a task cohesion barrier

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brainstorming activity to solve barriers to walking, whereas the dietary habits group did a task cohesion barrier brainstorming activity to solve barriers to eating vegetables and fruit. After 6 months of intervention activities, women completed a post-intervention (Time 2 [T2]) health assessment. Attendance was recorded throughout the study.

Measures

Group Cohesion—Group cohesion was measured using the PAGE-Q (Estabrooks and Carron 2000). The survey is a 20-item self-report questionnaire that assesses cohesion via perceptions of individual group members related to physical activity behaviors. Participants respond to items using a 9-point Likert-type scale, with answer choices ranging from strongly disagree to strongly agree. The PAGE-Q measures the four key dimensions of cohesion: ATGT (e.g., I like the amount of physical activity I get with this group), ATGS (e.g., I enjoy my social interactions with this group), GIT (e.g., Our group is in agreement about the types of physical activity that we should do), and GIS (e.g., Members of our group would likely spend time together if the program was to end). Derived from Carron and colleagues' (1988) model, these are the dimensions of group cohesion. There are two factors that affect commitment to the group: attraction to the group and group integration. One's attraction to the group is determined by the level of interest in interacting with group members. Group integration is the benefit gained from belonging to the group. Within each of these factors (attraction to the group and group integration) are task and social components. The ability of the group to work together to accomplish a common goal relative to a specific behavior is known as task cohesion, whereas the social fulfillment derived from group participation is known as social cohesion. Both task cohesion dimensions (ATGT & GIT) were assessed based upon the participants' perceptions of attractions and integration related to physical activity participation. The measure has demonstrated construct validity previously (Estabrooks and Carron 2000) and data from the present study demonstrated that the scales were internally consistent (Cronbach's alpha >.70). A change score was computed for each dimension of cohesion by subtracting the baseline value from that measured at 6-months post-baseline; these change scores were then used in the mediational analyses to estimate the effect of cohesion.

Attendance—Participant attendance was recorded at all assessments and intervention sessions. Attendance was measured using a sign-in sheet, where participants signed in by their name upon arrival. Early arrival was incentivized. Participants who came within 15 min of the session start time were eligible to enter a raffle for a $10 gift card at the end of the session. Sign-in sheet information was transferred to a spreadsheet and recorded by ID number. Participants either attended (1) or did not attend (0) the session. Intervention dose was measured as number of sessions attended divided by total number of sessions (6).

Analytic Plan

The potential mediating effect of cohesion on study group and class attendance was tested using the single-mediator model proposed by MacKinnon and Dwyer (1993). Using this model, the significance of the mediated effect is derived from three regression equations. The first equation, $Y = i_1 + cX + e_1$, is used to measure the effect size (c) of the independent variable, group assignment (X), on the dependent variable, attendance (Y). The second

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equation, $Y = i_2 + c'X + bM + e_2$, provides an estimate of the relationship between the independent variable on the dependent variable accounting for the influence of the mediator, the group cohesion construct (M). Likewise, this equation is also used to estimate the effect of the mediator (M) on the dependent variable (Y) after controlling for the independent variable (X). Finally, the third regression equation, $M = i_3 + aX + e_3$, measures the effect of the independent variable (X) on the mediator (M). In each equation, i_j is the average score and e_j is the error term (Fig. 1).

Three values are calculated using the estimates derived from the three regression equations in order to determine the significance of the mediated effect (MacKinnon et al. 2007; MacKinnon 2008). Using the Difference in Coefficients approach, we estimated the mediated effect by subtracting the value of c' from c; that is, subtracting the effect of the association between the independent variable and the dependent variable controlling for the mediator from the effect of the direct association between the independent variable and the dependent variable. The standard error and confidence interval were also calculated using the values derived from these regression equations. The mediating effect was considered significant if the confidence interval did not include the value zero (MacKinnon and Luecken 2008). It should be noted that this approach differs from the causal steps approach (Baron and Kenny 1986) in that it assumes that mediation can exist even in the absence of a significant relationship between the dependent and independent variable (MacKinnon and Farichild 2009). In fact it has been suggested that the requirement of a significant dependent–independent variable relation severely reduces the power to detect mediation (MacKinnon et al. 2007). In this manuscript, the series of regression models and calculations of the estimate of the mediated effect, standard error of the mediated effect, and confidence intervals, were completed separately for each of the four group cohesion constructs (ATGT, GIT, ATGS, GIS). All analyses were completed using SPSS 16.0.

Results

Described previously, of the 405 participants enrolled in the study, 95 individuals were excluded because they did not return to the randomization meeting after the first assessment or withdrew at the randomization meeting and were not randomized to a study group, suggesting the run-in procedure was effective at identifying likely candidates for drop-out prior to randomization (Lee et al. 2011a). An additional 62 participants were removed from the analytic cohort because they were missing group cohesion data at baseline. The remaining 248 cases were included in analyses. Mean age and BMI did not differ between the analytic cohort and those who were not included in the analytic cohort for the reasons stated above. The mean age of participants included in the analytic cohort was 46.4 years, and mean baseline BMI was 34.4 kg/m^2 (obese). A complete list of baseline characteristics for the sample can be found in Table 1. For all study analyses the significance level was set at $p<=0.05$.

Attraction to the Group's Task (ATGT) Mediational Analysis

Results from the first regression equation of the ATGT meditational analysis, a linear regression model estimating the direct association between the dependent variable, class

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attendance, and the independent variable, study group (path *c*), revealed a non-significant association between these variables ($F(1,247)=2.996$, $p=.085$). The beta value for study group in this model was β=−.417 indicating that attendance was greater for the physical activity group compared to the dietary habits group; however, only about 1% of the variance in attendance was explained by group ($R^2=.012$). The full model was significant upon adding ATGT as a covariate (analysis 2; $F(2,155)=4.303$, $p=0.015$). The beta coefficient for study group was not significant (β=−.007, $p=.977$), but the association between ATGT and attendance was significant (β=.202, $p=.007$) indicating that as ATGT score increased so did attendance. Adding ATGT change to the model inflated the R^2 to .053. The third analysis revealed a significant association between study group and the mediator, change in ATGT ($F(1,155)=20.171$, $p<.001$; β=-1.112; $R^2=.116$). According to these results, ATGT was more likely to increase for individuals in the physical activity group compared to those in the dietary habits group (Table 2).

The estimate of the mediated effect, the standard error of the mediated effect, and the upper and lower confidence limits of the mediated effect were calculated using the beta and standard error estimates derived from these three regression equations. The beta value for group in the second regression equation (β=−.007) was subtracted from the beta value for group in the first regression equation (β=−.417) resulting in an estimated mediated effect of −0.41. By subtracting the beta coefficient in the second equation from that in the first equation, the influence of ATGT as a mediator was isolated, as represented by the value −0.41. The standard error of the mediated effect was 0.096 while the confidence limits ranged from −0.599 (lower) to −0.221 (upper) indicating that the estimate of the mediated effect was significant and that ATGT significantly mediates the relationship between study group and attendance (MacKinnon and Luecken 2008).

Group Integration Task (GIT) Mediational Analysis

The first regression equation estimating the direct association between class attendance and study group (path c) is the same for each of the group cohesion constructs ($F(1,247)=2.996$, $p=.085$; β=−.417; $R^2=.012$). The second equation estimating the influence of study group and GIT on class attendance was not significant ($F(2,155)=2.236$, $p=.110$). Almost 3% of the variance in class attendance was explained by the variables in this model ($R^2=.028$). Neither the beta coefficient for study group (β=−.207, $p=.367$) nor GIT were significant (β=.107, $p=.065$). Finally, the regression equation assessing the impact of study group on GIT was not significant ($F(1,157)=.514$, $p=.474$, β=−.219), and very little variance in GIT was explained by study group ($R^2=.003$). Using the MacKinnon calculations, the mediated effect for GIT was significant, −0.210 (*SE*=0.060, *CI*: −0.092 to −0.328) suggesting that GIT significantly mediates the relationship between study group and attendance.

Attraction to the Group's Social Aspects (ATGS) Mediational Analysis

Overall, the second regression equation for the ATGS meditational analysis was not significant ($F(2,157)=2.037$, $p=.134$). However the individual beta coefficient for ATGS (β=.135, $p=.050$) was significantly associated with attendance, signifying that participants in the physical activity group were less likely to increase ATGS. Study group was not significantly associated with attendance in the model (β=.028, $p=.904$). These two variables

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explained nearly 3% of the variance in class attendance (R^2=.026). Equation three revealed that study group is not a significant predictor of the mediator, ATGS [F(1,157)=3.265, p=.073; β=.490; R^2=.020]. Based on the values obtained from these three regression equations, the estimate of the mediated effect was significant −0.445 (*SE*=0.046, *CI*: −0.546 to −0.366). In other words, the difference between the first equation, which calculated the direct effect of study group on attendance, and the second equation, which calculated the effect of ATGS and study group on attendance, revealed that ATGS is a significant mediator of the study group-attendance relationship.

Group Integration Social(GIS) Mediational Analysis

Neither the second regression equation for the GIS meditational analysis—the full model including study group and GIS as predictors of class attendance (F(2,157)=1.217, p=.299)—nor the beta coefficients for study group (β=.039, p=.867) or GIS (β=.084, p=.134) were significant. Moreover, only a limited amount of variance was explained in this model (R^2=.015). Study group was a significant predictor of GIS [F(1,157)=3.840, p=.052; β=.651; R^2=.024] in the third regression equation indicating that GIS was less likely to increase for participants in the physical activity group compared to participants in the dietary habits group. Finally, the estimate of the mediated effect of GIS was significant −0.456 (*SE*=0.046, *CI*: −0.546 to −0.366) since the influence of GIS was significant when isolated from the effect of study group on attendance. See Fig. 2 for a graphical depiction of results for each mediational model.

Discussion

The purpose of this study was to determine the mediational effect of the four group cohesion constructs and to test whether ATGT and GIT would be significant predictors of attendance for the physical activity group, but not the dietary habits group. Analyses revealed that all group cohesion constructs significantly mediated the association between group assignment and attendance, regardless of group assignment. Because participants in both the physical activity and dietary habits groups received an intervention based on social cohesion and the measure of social cohesion was directed toward both behaviors, we expected that ATGS and GIS would mediate the association between study group and attendance for both study groups. Conversely, both the physical activity intervention and the dietary habits intervention targeted task cohesion associated with the related behavioral task (i.e., physical activity or dietary habits), but the PAGE-Q measure is more sensitive to physical activity behaviors. We expected that task cohesion would only significantly mediate the association between study group and attendance for the physical activity group, yet task cohesion was a significant mediator for both groups.

There may be several possible reasons that task cohesion significantly mediated the association between study group and attendance. First, although the PAGE-Q was directed toward physical activity behaviors, participants in the dietary habits group may have answered the questions with their groups' tasks in mind. If this was the case, participants may have unintentionally tailored the questions toward their own behaviors. Second, although it is a measure intended for physical activity, the task cohesion items on the PAGE-

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Q may also be sensitive to other behaviors. Interestingly, the largest amount of variance in the mediational models was explained by the task-related variables, consistent with our hypotheses. Although only one of our two hypotheses was supported, we believe that there is value in demonstrating that attendance at a health-related behavior change program can be improved by targeting task and/or social cohesion.

Group cohesion has shown promise in white populations (Burke 2006; Estabrooks 2000), and this study is among the first to suggest that it may be useful for enhancing attendance in interventions focused on women of color. Attendance and other barriers to access are often cited as barriers to participation in physical activity among women of color (Lee and Cubbin 2009); therefore, strategies to increase attendance and access to the intervention concepts, strategies and connections are very important. These data suggest that both task and social dimensions are important to include in health promotion interventions focused on women of color. Of note, women responded to task dimensions, as expected, but also responded well to social dimensions. This finding is consistent with cultural dimensions focusing on family sociability, that make social cohesion particularly salient in these populations (Cutrona et al. 2000; Ingram et al. 2009; Pinto et al. 2008).

This study addressed women of color, a particularly vulnerable population to health compromising conditions, and for whom health interventions have historically had little impact. Study procedures were theoretically grounded, relying on reliable and valid measurements. State of the art analytic procedures were used to test hypotheses. The mediation approach used here (MacKinnon et al. 2007) offers several strengths over the more commonly used causal steps approach (Baron and Kenny 1986) to mediation. First, the MacKinnon et al. approach draws a better balance between Type 1 and Type 2 error whereas the Baron and Kenny approach is traditionally low in Type 1 error at the expense of power. Second, the MacKinnon et al. approach makes it possible to calculate an estimate of the mediated effect and to test for significance. Despite these strengths, limitations include restricted generalizability to other groups, including males, other ethnic groups and age groups. Although participants did not differ in age or BMI at baseline, it is hard to determine whether they did not differ in some other way related to group cohesion and intervention adherence. Ideally, participants would have been offered transportation to attend the study sessions. Although they were compensated for participating, they were not offered free transportation to sessions which could have potentially presented a barrier to participation. Additionally, reminders were sent to participants to attend the randomization session with the completed run-in packet, and participants with scheduling conflicts were accommodated. Despite these efforts, some women did not attend the randomization session and were excluded from the study. Prior to entering the study, women were screened to read, write, and speak English or Spanish. Transportation and/or literacy concerns may be further limitations of this study.

Study findings suggest that group cohesion develops from even a modest intervention (six sessions over 6 months), and has important implications for increasing attendance in studies of women of color. Regardless, the fact that the group cohesion develops from exposure to a relatively low-dose intervention may be important for brief intervention strategies that rely on short, lower doses of intervention that must be broadly disseminated in clinical and

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public health settings. As the US grows more diverse and access to care continues to be a health concern for many emerging population subgroups, the need for theoretically grounded interventions that are broadly disseminable will increase. It is important for future researchers to conduct similar studies with different populations within a variety of intervention settings to determine whether study findings are replicable. Attendance at programs, access to information, skill training, infrastructure development and social support for physical activity remain challenges in emerging populations of color. These data suggest that brief interventions can lead to group cohesion around the task of accomplishing daily physical activity and the social elements of group participation, that in turn, lead to enhanced attendance and intervention dose. Future studies should explore the use of abbreviated interventions to improve health in emerging populations.

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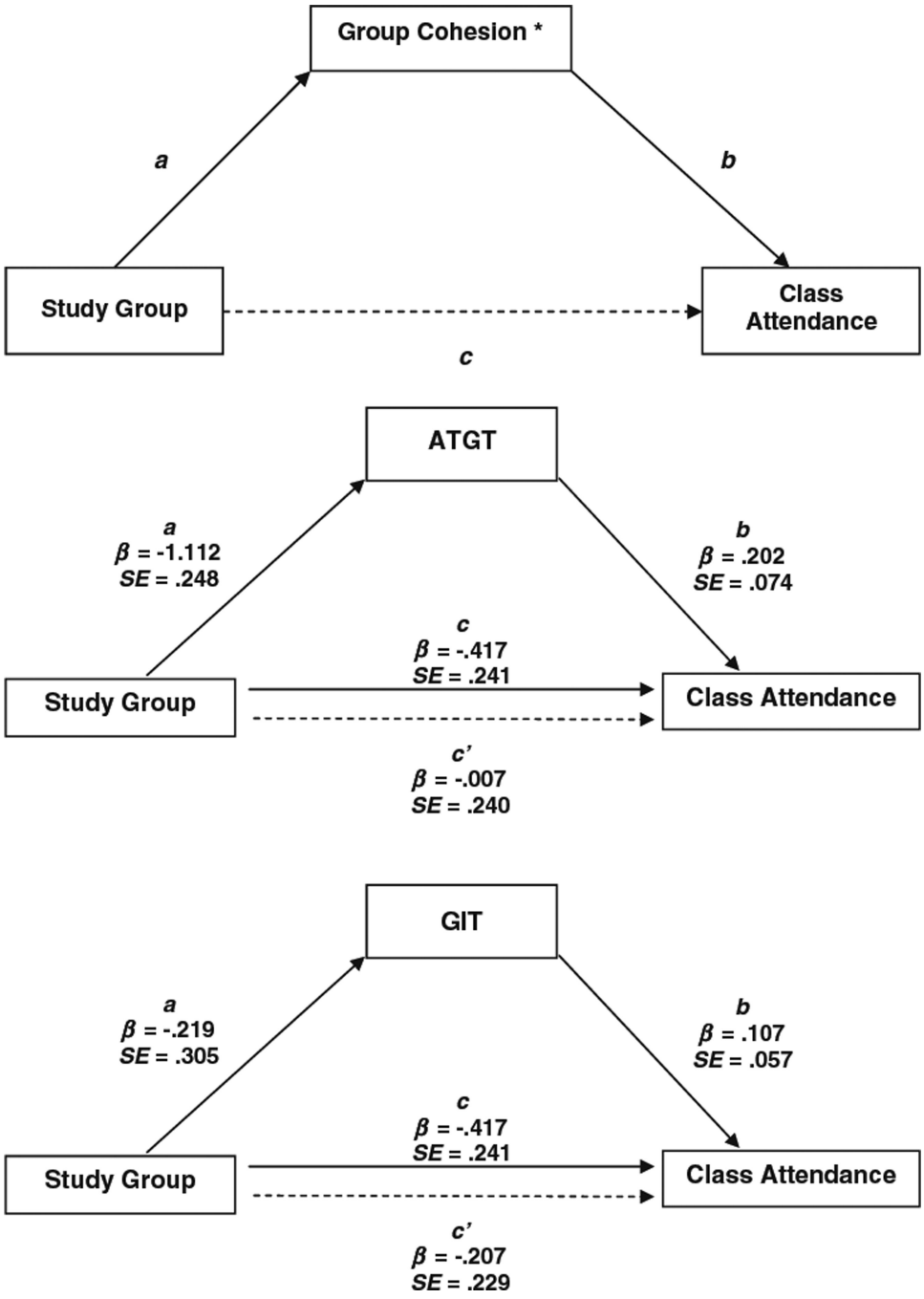

Fig 1.

Group cohesion (ATGT, GIT, ATGS or GIS) as a mediator of group and attendance. Group cohesion is represented by four separate constructs: attraction to the group's task (ATGT), group integration around the task (GIT), attraction to the group's social aspects (ATGS), and group integration around social aspects (GIS)

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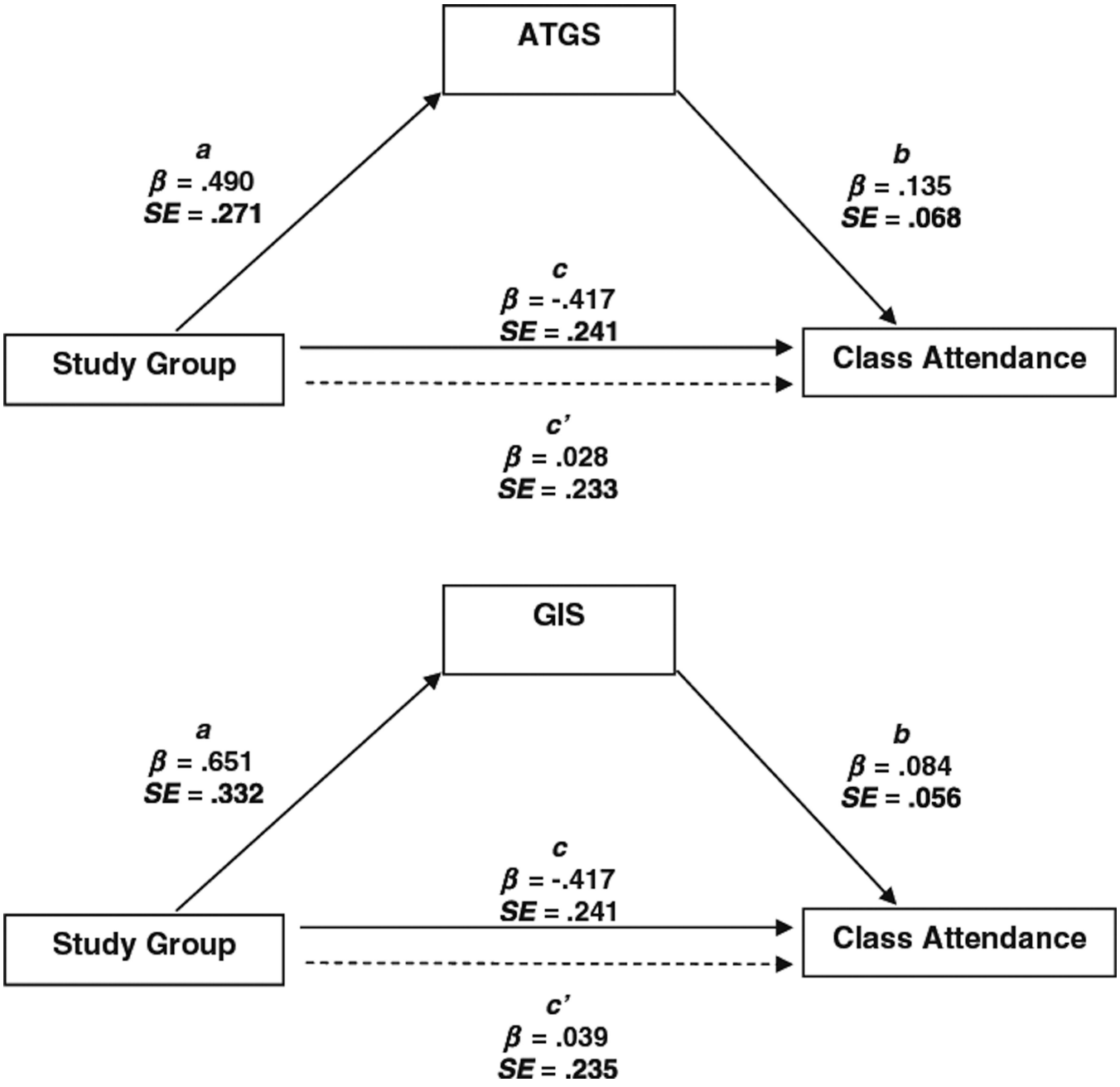

Fig 2.
Mediation estimates for the study group to class attendance mediation models

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Table 1

Participant characteristics

	Physical activity group		Fruit & vegetable group		Total	
	Mean	***SD***	**Mean**	***SD***	**Mean**	***SD***
N	162		86		248	
Age	47.07	8.46	45.03	10.16	46.36	9.12
Attendance (Days)	3.77	1.82	3.35	1.78	3.62	1.81
Baseline BMI	34.64	7.88	33.87	7.39	34.37	7.71
ATGT Change[a]	1.06	1.43	−0.05	1.52	0.68	1.55
GIT Change[a]	1.22	1.84	0.99	2.01	1.14	1.90
ATGS Change[a]	0.73	1.57	1.20	1.88	0.89	1.69
GIS Change[a]	−1.05	1.96	−0.33	2.27	−0.80	2.09

[a]Change in mediators from baseline to post-intervention

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Table 2

Estimates of the mediated effect for each of the four group cohesion constructs

Group cohesion construct	Estimate of the mediated effect	Standard error	Confidence interval	R^2 (full model[a])
ATGT	−0.410*	0.096	−0.599 to −0.221	.053
GIT	−0.210*	0.060	−0.092 to −0.328	.028
ATGS	−0.445*	0.049	−0.542 to −0.348	.026
GIS	−0.456*	0.046	−0.546 to −0.366	.015

[a] The full model includes class attendance as the dependent variable; covariates include study group and the group cohesion mediator

* Represents a significant mediator effect