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ACCEPTANCE PAGE

This dissertation, THE RELATIONSHIP BETWEEN INTRINSIC MOTIVATION, MOTIVATIONAL INTERVIEWING AND PHYSICAL ACTIVITY IN AN AFRICAN AMERICAN CHURCH POPULATION, by SIMONE S. RAHOTEP, was prepared under the direction of the candidate's Dissertation Advisory Committee. It is accepted by the committee members in partial fulfillment of the requirements for the degree Doctor of Philosophy in the College of Education, Georgia State University.

The Dissertation Advisory Committee and the student's Department Chair, as representatives of the faculty, certify that this dissertation has met all standards of excellence and scholarship as determined by the faculty. The Dean of the College of Education concurs.

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Simone S. Rahotep

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ABSTRACT

MOTIVATIONAL INTERVIEWING: A PATH TOWARD
HEALTH BEHAVIOR CHANGE IN AFRICAN AMERICANS
by
Simone S. Rahotep, M.S.

African Americans carry a disproportionate amount of the health burden for chronic disease in the United States (Center for Disease Control and Prevention, 2007). Diabetes, heart disease and cancer, to name a few, are diseases which prematurely capture the lives of African Americans. While chronic, these diseases are preventable with the advent of behavioral change. Physical activity is a primary contributor to longer life expectancy and fewer health concerns (United States Department of Health and Human Services, 1996). While American society, as a whole, struggles to incorporate more physical activity in their lifestyles, African Americans exhibit higher levels of physical inactivity which correlates to higher instances of preventable and chronic health problems in this subgroup of the population. Thus intervention which addresses the specific needs of this community, the mechanisms by which to prompt behavior change and the most effective means to disseminate this information is needed to affect health behavior change in this population. The African American church provides an ideal vehicle by which to diminish these health issues as existing teaching, support and resource mechanisms can be utilized. The current paper explores the relationship between increasing intrinsic motivation through employing motivational interviewing as a strategy to increase physical activity among African Americans church members.

THE RELATIONSHIP BETWEEN MOTIVATIONAL INTERVIEWING, INTRINSIC MOTIVATION AND PHYSICAL ACTIVITY IN AN AFRICAN AMERICAN CHURCH POPULATION

by

Simone S. Rahotep

A Dissertation

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Degree of
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in
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in
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in
the College of Education
Georgia State University

Atlanta, Georgia
2008

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ABBREVIATIONS

CDC	Centers for Disease Control and Prevention
USDHHS	United States Department of Health and Human Services
NCMHD	National Center on Minority Health and Health Disparities
NIH	National Institutes of Health
MI	Motivational Interviewing
SDT	Self-Determination Theory
TSRQ	Treatment Self-Regulation Questionnaire
EFL	Eat for Life
HBHS	Healthy Body, Healthy Spirit
CHAMPS	Community Healthy Activities Model Program for Seniors
MINT	Motivational Interviewing Network of Trainers
MET	Metabolic Equivalent

CHAPTER 1

MOTIVATIONAL INTERVIEWING: A PATH TOWARD HEALTH BEHAVIOR CHANGE IN AFRICAN AMERICANS

Introduction

Chronic disease is the leading cause of death in the United States; accounting for seven of every 10 deaths (Center for Disease Control and Prevention [CDC], 2005). In 2002, five of the top six causes of death were attributed to chronic diseases such as heart disease, cancer and diabetes. Despite the preponderance of cases, many chronic diseases can be prevented, controlled or improved through routine physical activity (CDC, 2003; 2005; 2007). Physical activity has been linked to decreases in morbidity and mortality rates associated with chronic disease, but less than fifty percent of the US population engages in physical activity that is compatible with public health recommendations (CDC, 2003).

In 1996, the Surgeon General issued an historic report on the relationship between physical activity and quality of health (United States Department of Health and Human Services [USDHHS], 1996). This seminal text elucidated a positive relationship between physical activity and health outcomes. The report identified physical inactivity as a major health risk for many Americans. Specifically, a sedentary lifestyle coupled with poor eating habits, accounted for over 300,000 American deaths each year. Only tobacco ranked higher as a cause of preventable death (Mokdad, Marks, Stroup & Gerberding, 2005). The Surgeon General's Report indicated that over 60% of Americans are not regularly active and 25% are not active at all. Lack of physical activity has been

identified as a significant risk factor for the development of cardiovascular disease (CDC, 2007; USDHHS, 1996). Additionally, regular physical activity has shown to decrease risk for high blood pressure, diabetes, heart attack and colon cancer (CDC, 2007).

Physical inactivity is more predominant among racial and ethnic minorities than it is among Caucasians (Crespo, Smit, Andersen, Carter-Pokras, & Ainsworth, 2000). In 2002, the CDC reported that 37% of Hispanics and 33% of African Americans reported no physical leisure time activities compared to 22% of Whites. Comparatively, African Americans are more likely to engage in a sedentary lifestyle than are Caucasians. Racial minorities are disproportionately dying from preventable diseases (National Institutes of Health [NIH], 2006). Health disparities between minorities and Caucasians are so severe that the government has taken specific action to address the issue. The National Center on Minority Health and Health Disparities (NCMHD) was created in 2000 by the passage of the Minority Health and Health Disparities Research and Education Act, Public Law 106-525. The NCMHD works to lead, assess, support and evaluate the NIH in the effort to reduce and eventually eliminate health disparities (NIH, 2006). Reducing the disparity of activity level between these groups is a national health objective (USDHHS, 1996) which has the potential to preserve life in communities of color.

Based on the health statistics, compared to Caucasians, diabetes is 70% more prevalent in African Americans and 100% more prevalent in Hispanics. African American adults are 30% more likely to die of cardiovascular disease than their adult white counterparts (CDC, 2005); being overweight and obese is more prevalent in minority populations, especially among African American and Hispanic and these factors are considered contributing factors to the high rate of hypertension in minority

populations (CDC, 2002). African Americans have earlier onset and run a more severe course of hypertension than other groups. The Centers for Disease Control reported in 2005 in their "Morbidity and Mortality Weekly Report," that the prevalence of hypertension was 40.5 percent among non-Hispanic Blacks compared to 27.4 percent among non-Hispanic whites and 25.1 percent among Mexican Americans.

African Americans and other minorities are less likely than Whites to participate in physical activity behaviors, which combined with a healthy diet, are the recommended course of action for improving health and reducing or preventing chronic disease (CDC, 2007). The NIH recognized the crisis. They indicated that the existing health disparities were at critical levels and not only created an organization to focus on these issues, but also committed fiscal resources toward research, partnerships and community outreach. It is evident that changing health behaviors is a national public health priority (CDC, 2007; NIH, 2006). The CDC (1999) identified Americans' lack of physical activity as a major health concern, one of nationwide proportions. An increase in physical activity could lead to a substantial decrease in preventable chronic disease.

In addition to health policy changes and practices, behavior change at the individual level must occur. Americans must increase their physical activity behaviors. Minorities in general are in need of changes, and African Americans specifically must find ways to improve their collective health. African Americans are disproportionately suffering from preventable health concerns; they account for only 12% of the population in the United States, yet as a group they have the poorest health status indicators in the nation (USDHHS, 2002). African Americans are more likely to be overweight, have hypertension, diabetes, and be less physically active than their white counterparts.

Interventions are needed that work, particularly interventions that address the cultural needs of this specific population. (Resnicow et al., 2001). The Guide to Community Preventive Services suggested individually adapting health behavior change interventions to successfully increase physical activity behavior (Briss, Brownson, Fielding, & Zaza, 2004)

Despite the prevalence of health education information about preventable health issues, the numbers of deaths from preventable disease was over 800,000 in the first six months of 2007 (CDC, 2007). Behavioral health educators have indicated that information alone is not a sufficient means by which to promote sustainable health behavior change. People must make a conscious decision to alter their lifestyle practices. While this appears to be the most the most logical answer, researchers are in the midst of exploring the cognitive and behavioral correlates that support sustainable health behavior change. One approach to impacting health behavior change has been the use of Motivational Interviewing (MI) as an intervention (Miller & Rollnick, 2002). MI is a technique that has been found to be quite effective in health promotion studies in the field of public health (Ang, Kesavalu, Lydon, Lane & Bigatti, 2007; Rose, Phillips, & Welch, 2007; West, DiLillo, Bursac, Gore & Greene, 2007). This approach has been used effectively with various racial and ethnic groups, including African Americans with positive results (Añez, Silva, Paris, & Bedregal, 2008; Resnicow, et al., 2001). MI encourages the client to be autonomous; by promoting the development of intrinsic motivation (Miller & Rollnick, 1991). Intrinsic motivation has been linked to positive behavioral, affective and cognitive outcomes (Biddle, Soos & Chatzisarantis, 1999), maintenance of change behaviors (Deci & Ryan, 1991), self-efficacy and life satisfaction

(Senécal, Nouwen & White, 2000). Given the health disparities between African Americans and their Caucasian counterparts, and given the national priority to decrease these discrepancies, it is important to investigate new and more effective ways of addressing these issues.

This paper will focus on the relationship between Motivational Interviewing, intrinsic motivation and physical activity behaviors among African American church members. An initial look at theories of behavior change with a focus on self-determination theory; the role of intrinsic motivation in behavior change and its connection to motivational interviewing will also be discussed. Next an exploration into how this approach can be applied to people of color, with an emphasis on African Americans will be presented. Finally, implications for research and policy changes will be addressed, followed by the limitations in current research, and recommendations for future investigation.

Self-Determination Theory and Intrinsic Motivation

There have been many approaches and recommendations to decreasing health disparities in the United States. A primary consideration to improve the nation's health is to decrease the number of people suffering from preventable diseases (USDHHS, 1996). Getting people to exercise regularly is a national priority (USDHHS, 1996). How to do this effectively has not been determined. Despite the wealth of information on the benefits of exercise, despite the advice of health practitioners, the majority of Americans remain sedentary. Many researchers believe that to change health behaviors, people must be motivated to change (Rollnick & Miller, 2005; Resnicow, et al., 2001). How to

identify, increase, and maintain this motivation has been a challenge for many in the field of public health and psychology.

Ryan and Deci (2000) describe motivation as consisting of activation and intention, and view it as essential to biological, cognitive and social regulation. Miller and Rollnick (1991) describe motivation not as a trait, but rather as a state of readiness. This state may vary from time to time, and can be altered by influence. Prochaska and DiClemente (1982) present motivation as an internal state that is influenced by external factors. Deci & Ryan (1995) explain that people become more intrinsically motivated when their experiences are providing need satisfaction.

In 1985, Ryan and Deci presented the first real comprehensive statement on Self-Determination Theory (SDT), making it still a relatively new theory. Self-Determination Theory is focused on the actions of self and how one makes decisions. Self-Determination Theory suggests that there are three, basic, fundamental psychological needs that every person possesses. These needs are: autonomy, competence, and relatedness. Ryan & Deci (2000) indicate that when these needs are met, it promotes integrity, health and well being. A failure to meet these needs leads to negative consequences. The authors identify types of motivation as being significant for changing behavior. Deci and Ryan (2008) indicate that Self-Determination Theory (SDT) is useful in predicting behavior change outcomes. Deci and Ryan describe SDT as a macro theory of human motivation addressing issues such as self-regulation, universal psychological needs, life goals and aspirations, personality development, and a wide range of life domains. SDT breaks motivation into three main categories: autonomous motivation, controlled motivation, and amotivation. SDT suggests that outcomes are better predicted

by a person's type or quality of motivation than their total amount of motivation. The outcomes they identified included effective performance, psychological health and well-being, creative problem solving, and deep or conceptual learning.

Delineating between autonomous motivation and controlled motivation is the cornerstone of SDT (Deci & Ryan, 2008). Controlled motivation is comprised of both external regulation and introjected regulation. External regulation is when one's behavior is a function of external factors such as reward or punishment. Introjected regulation refers to the partially internalized regulation of action that is prompted by a motive for approval, shame avoidance, or ego involvements. Autonomous motivation is made up of intrinsic motivation and forms of extrinsic motivation wherein the person has connected with the value of an activity and then ideally integrates that value into their sense of self. According to Deci and Ryan (2008), autonomous motivation leads to volition or self-endorsement of action while controlled motivation leads people to feel pressured to think, believe, feel or behave in a particular way. In contrast to both autonomous and controlled motivation, amotivation is described as an overall lack of intention or motivation.

Ryan and Deci (2002) noted that while both controlled and autonomous motivation can regulate behavior, it is the impact of each type that is significant. According to SDT, controlled, extrinsic motives are linked with poorer mental health, and contingent self worth, while more autonomous motives are linked to more sustained behavior and positive mental health.

Ryan and Deci (2000) define intrinsic motivation as "…the inherent tendency to seek out novelty and challenges, to extend and exercise one's capacities, to explore, and

to learn" (p.70). It is not the amount of motivation that is most affected by actions that are either autonomously or environmentally controlled, but rather, it is the type of motivation. Motivation that is guided by extrinsic pressure or control is considered extrinsic in nature, while motivation that is born of choice, desire and interest is thought of as intrinsic motivation.

Fortier, Sweet, O'Sullivan & Williams (2007) suggested that when a practitioner is working from an SDT framework, using an autonomy support therapy, patients are more likely to engage in health behavior change such as physical activity. The positive results are attributed to high level of autonomous motivation and competence. To achieve these levels, the authors suggested that health care practitioners engage in a counseling style that relies heavily on listening, respecting, and collaborating with patients. This type of engagement is autonomy supportive behavior and will lead to increases in perceived competence for the patient. The patient's motivation will become more autonomous and this will in turn lead to the facilitation of behavior change. The authors noted that because of MI's autonomy supportive style and easy mix with SDT, practitioners should be trained in MI techniques which, when used in conjunction with their autonomy supportive style would increase patient levels of autonomy, perceived competence and subsequent behavior change (Fortier, et al., 2007).

The use of SDT can be found in recent research. Williams et al. (2006) tested SDT intervention and process model of health behavior change for tobacco cessation using a longitudinal randomized trial. The study was conducted on adult smokers (n = 1006) recruited for a study of smokers' health. The participants were assigned to either intensive treatment or community care. The intervention group reported greater

autonomy support and greater autonomous and competence motivations than the control group. The intervention group also reported higher levels of medication use and greater abstinence. Perceived autonomy support leading to increases in autonomous and competence motivations finally leading to significantly greater abstinence was confirmed by structural equation modeling. The causal role of autonomy support in the internalization of these competencies and eventual cessation also was supported.

Williams, Gagné, Ryan & Deci (2002) used SDT in their study of facilitating autonomous motivation for smoking cessation. Twenty-seven primary care physicians worked with 316 nicotine dependent patients. The patients completed a questionnaire and attended a doctor's visit during which they were randomized to the treatment condition. The doctors used either an autonomy-supportive or a controlling interpersonal style to counsel smokers. The sessions were audiotaped and analyzed by trained observers to rate the physicians style for their degree of autonomy supportive behavior. Follow-up at six, 12, and 30 months was conducted to evaluate prevalence and continuous cessation. The intervention did not have a direct effect on quit rates, but it did support the self-determination process model of smoking cessation. The findings indicated that the autonomy-supportive intervention was rated more autonomy-supportive and thus predicted autonomous motivation. As follows in SDT, autonomous motivation predicted cessation at all follow-up points. The Treatment Self Regulation Questionnaire (TSRQ) was used to assess autonomous regulation. Senécal, Nouwen, and White (2000) incorporated SDT when they evaluated motivation and dietary self-care in an adult population with diabetes (n=638). In their study, they examined constructs from Bandura's social-cognitive theory (1986) and Deci and Ryan's (1985, 1991) SDT.

Specifically they looked at self-care and life satisfaction. The authors found that adherence was more strongly associated with self-efficacy while life satisfaction was more significantly associated with autonomous self-regulation.

Biddle, Soos, & Chatzisarantis (1999) used both SDT and goal orientation theory when they studied a group of Hungarian youths and evaluated predictors of their physical activity intentions. The results indicated that self-determined forms of behavioral regulation were the main predictors of intention. The authors illustrated that self-determined forms of behavioral regulation are linked most often with positive behavioral, affective, and cognitive outcomes.

Fuemeller, et al. (2006) reported results from a randomized effectiveness trial in 14 African American churches with 470 participants in the intervention group and 285 participants in the control group. The study looked at fruit and vegetable intake and proposed mediators. Outcomes were measured at baseline and at six month follow-up. The researchers found that social support and self-efficacy were significant mediators, but autonomous motivation was not significant.

Similarly, Curry, Wagner and Grothaus (1990) evaluated an intrinsic-extrinsic model of motivation related to smoking cessation. Their study was conducted on two samples (n = 127 and n = 151) of smokers who requested self-help materials for smoking cessation. They utilized a 36-item Reason for Quitting scale that supported the intrinsic-extrinsic motivation distinction. They instituted a four factor model with two intrinsic dimensions (concerns about health and desire for self-control) and two extrinsic dimensions (immediate reinforcement and social influence). These dimensions defined 20

of the 36 items on the scale. These 20 items provided moderate to high levels of internal consistency and convergent and discriminant validity. Based on the research of Deci & Ryan (1985) who looked at achievement motivation, it was believed that intrinsic motivation would be more associated with higher performance and extrinsic motivation would be detrimental to sustained performance. The authors' findings paralleled those of Deci & Ryan in regards to the detrimental effects of external motivation. The research found that smokers with higher levels of intrinsic motivation in comparison to extrinsic motivation were more likely to succeed in their smoking cessation than their counterparts.

In a secondary analysis of data from a larger randomized study of successful computerized interventions with diabetes patients, Williams, Lynch, & Glasgow (2007) found support for the self-determination model for health behavior change. A two -group cluster randomized design was used with 469 patients in the intervention and 417 in the control group. Patients were asked to arrive 30 minutes early to their scheduled health screenings to engage in a touch screen computer assisted assessment and action planning procedure designed to improve aspects of diabetes self-care including diet, physical activity and smoking behavior. The program assessed current behaviors, explored goals, barriers and patient strategies to overcome barriers. It provided patients with a summary of goals and action plan. It also created a list of items the patient wanted to discuss with the doctor and this information was provided to the case manager. Self-management outcomes improved with the use of the computer assisted intervention as did patient perceived competence. Mediation analysis found that an increase in perceived autonomy support on diabetes distress and depressive symptoms was partially mediated by a change

in perceived competence. The results indicated that the intervention was effective in part because patients perceived support from the care provider for their own (autonomy) self-managing of their diabetes.

Bagøien and Halvari (2005) also used the Self-Regulation Questionnaire to test 231 high school students for motivational regulation, while their involvement in physical activity and their perceived sport competence were both assessed using the Harter Perceived Competence Scale (1978). Autonomous motivation, perceived sport competence, and physical activity involvement were all positively correlated.

Research has shown intrinsic motivation to be linked with higher performance, while extrinsic motivation is more detrimental to sustained performance (Deci & Ryan, 1985). It is the individual that is functioning from an intrinsically motivated state that is more likely to be successful in their behavior change strategies, and they are more apt to sustain their desired outcome.

Given these findings, it is logical that an intervention designed to promote health behavior change should implement a component designed to facilitate intrinsic motivation. The challenge then is to determine how intrinsic motivation is facilitated and how a person's level of intrinsic motivation is measured. The Treatment Self-Regulation Questionnaire (TSRQ) is specifically designed for assessing the degree to which behaviors tend to be self-determined. The literature is lacking is a conclusive finding on how to facilitate or increase a person's level of intrinsic (autonomous) motivation.

This paper will explore the use of MI as a tool to impact behavior change and its impact on intrinsic motivation. According to Miller and Rollnick (2002), the focus of

Motivational Interviewing is to elicit intrinsic motivation toward a particular change outcome. They explain that constructive behavior change occurs when a person connects their desired outcome to something they intrinsically value. This connection facilitates an intrinsic motivation to change. The authors suggest that motivation is enhanced in supportive, accepting environments that allow the individual to explore the discrepancies between their current behavior and the behavioral outcomes they want to achieve. Some authors suggest that MI can be conceptualized and informed by SDT (Foote et al., 1999; Ginsberg, Mann, Rotgers, & Weeks, 2002). Markland, Ryan, Tobin & Rollnick (2005) argued that the efficacy of MI can be better understood through the theoretical framework of SDT. Vansteenkiste, & Sheldon (2006) suggested that a combination of the practical application of MI and the theoretical approach of SDT would be a logical and fruitful mix being mutually beneficial for both sides. While many authors see a connection between the two, it is important to note that they were created independent of each other, and in fact, MI began years before the creation of SDT.

Motivational Interviewing

In 1983, W.R. Miller proposed the idea of Motivational Interviewing (MI). In 1991, William Miller and Stephen Rollnick wrote a text entitled Motivational Interviewing: Preparing People to Change Addictive Behavior. This seminal text brought the concepts and theory of Motivational Interviewing to the general public. Rollnick and Miller (2002) define MI as a "client-centered, directive method for enhancing intrinsic motivation to change by exploring and resolving ambivalence" (p. 25). Motivational Interviewing is a technique that has been utilized by many public health and medical professionals to actively address health behaviors and conditions including: physical

activity, diet, pain management, diabetes control, screening, smoking, medical adherence and sexual behavior (Ang, Keavalu, Lydon, Lane & Bigatti, 2007; Bennett, Lyons, Winters-Stone, Nail & Scherer, 2007; Brodie & Inoue, 2005; Resnicow et al., 2002; Stott, Rollnick, & Pill, 1995; Taplin et al., 2000; Velasquez et al., 2000, Smith Heckemeyer, Kratt, & Mason, 1997).

Motivational Interviewing has recently been used as a tool to promote health behavior change by increasing individuals' motivation to change. The approach is designed to empower the participant, encouraging them to make choices for themselves. It allows people to explore ambivalence without guilt and fosters a feeling of self-reliance. Studies show that motivational interviewing is especially effective for people who are at a low readiness to change (Butler et al., 1999; Heather, Rollnick, Bell, & Richmond, 1996; Resnicow et al., 2002). The process is designed to not only increase a person's motivation, but specifically the goal is to elevate their intrinsic motivation levels, thus fostering a more self-assured, self-reliant, and self-efficacious individual.

Motivational Interviewing is a practice, based on the theories and practices of client-centered psychotherapy and behavior change strategies (Miller & Rollnick, 1991). MI utilizes a variety of techniques to progress through the change process. Reflective listening, open-ended questions, summarizing, eliciting change talk and values clarification are all components of a productive MI encounter (Miller & Rollnick, 1991; Resnicow et al., 2002). In particular, MI is most effective when utilized with a person who is resistant to change (Miller & Rollnick, 1991). The client is allowed to own their feelings of resistance and is not held in judgment by the practitioner. The practitioner listens actively and solicits information to better understand the client's point of view. It

is not the practitioner's role to change the position of the client. The MI practitioner is trained to "roll with resistance." This technique includes validating the client's feelings about their situation and reflecting for the client the feelings and meaning associated with their position (Miller & Rollnick, 2005). The practitioner works with the client to identify barriers to change and then to assist the client in problem solving strategies.

In MI encounters, the client is expected and encouraged to do most of the talking as well as doing the psychological work to identify their personal barriers and solutions toward change. There are appropriate instances for the counselor to provide information or advice, however, this is generally done at the request of the client or after the counselor asks permission to provide additional suggestions, information or strategies that have worked for others (Miller & Rollnick, 1991). Nevertheless, the counselor refrains from providing this type of information until the client has had the opportunity to explore their ambivalence (Miller & Rollnick, 1991; 1995). This emphasis on client exploration and self-identified solutions to their barriers is what distinguishes MI from most health education practices, which rely heavily on providing information (Resnicow et al., 2001).

The research supports MI as a therapeutic intervention for behavior change. Rubak, Sandboek, Lauritzen, and Christensen (2005) concluded that MI is effective when used in a scientific setting, and it is more successful than traditional advice giving for a broad range of diseases and behavioral issues. The researchers evaluated the effectiveness of MI in different areas of disease and looked at factors that shape outcomes. They conducted a systematic review and meta-analysis of randomized controlled trials with MI as an intervention. They reviewed 16 databases, covering 72 randomized controlled trials.

Individual interviews were used in 94% of the studies, group encounters and telephone interviews were used in the other six percent of encounters. Effects of MI were seen in 74% of these studies, with no adverse effects related to the use of MI. Three out of four studies were found to have significant and clinically relevant effects from MI.

In a meta-analysis of controlled clinical trials, Burke, Arkowitz, and Menchola (2003) reviewed the efficacy of MI. They determined that MI does have clinical impact because participants who receive it as an intervention tend to improve. In their review of 30 individual based controlled trials, the authors found that MI had significant effect sizes with drug, diet, and exercise when compared to non-treatment placebo groups. There was almost no effect for smoking and HIV-risk behaviors, and no significant effect found when comparing MI to other established treatment techniques.

In their systematic review, Knight, McGowan, Dickens, and Bundy (2006) evaluated MI effectiveness in physical health care settings. An electronic database searched produced 51 relevant abstracts of which eight studies were selected. These studies were conducted in the areas of diabetes, asthma, hypertension, hyperlipidaemia, and heart disease. Positive effects were found in most studies for the use of MI on psychological, physiological and life-style change outcomes. The qualities of the trials were questioned due to small sample sizes, lack of power, disparate multiple outcomes, inadequate validation of questionnaires and poorly defined therapy or training. As a result, the authors suggested that MI has high face validity in physical care settings across many domains, but generalizability is unwarranted due to the quality of the trials.

Motivational Interviewing and Addictions

Motivational Interviewing was developed for treating addictions and is considered a promising treatment due to the empirical evidence of its efficacy in substance abuse treatment (Burke, Arkowitz, & Dunn, 2002; Dunn, Deroo, & Rivera, 2001). Miller, Benfield, & Tonigan (1993) studied the effects of therapist style on 42 alcohol abusers, using a two session motivational check-up. Participants were assigned to one of three groups: (1) immediate check-up with directive confrontational feedback, (2) immediate check-up with client-centered feedback, or (3) delayed check-up. A significant reduction in drinking was found at the six week follow up and was maintained over a one year follow up. Participants assigned to the immediate check-up conditions had significant decreases in alcohol consumption compared to the participants in the control group. Therapists using the directive-confrontational approach elicited more resistance from clients and produced less positive results at the one-year follow-up. The findings of this study support that motivation can be increased through brief motivational interventions (i.e., client-centered feedback), and further that the style of therapist impacts the effectiveness of the treatment.

Bien, Miller, & Boroughs (1993) used motivational interviewing with alcohol outpatients. They found that motivation could be viewed as a result of interpersonal process not just personal characteristics. The authors studied the effects of the intervention with 32 clients seeking treatment for severe substance abuse in an outpatient setting. Participants were all classified as severe alcohol abusers based on the Michigan Alcoholism Screening Test. The participants were randomly assigned to either a MI brief intervention group or control group who received the outpatient treatment program. At

the three-month follow up, participants from the brief MI group showed significant decreases in their total standard drinks, peak alcohol levels, and in their percent of days abstinent, relative to those in the control group. By the six month follow up, no significant between-group differences remained.

Motivational Interviewing and Nutrition

Ahluwalia, et al. (2007) used a cluster-randomized trial to examine the effectiveness of an intervention to increase fruit and vegetable consumption in a sample of smokers living in public housing. There were 20 randomized public housing projects, 10 were assigned to a fruit and vegetable intervention and the other 10 were assigned to a smoking cessation intervention. Both groups received MI counseling and intervention materials (cessation or fruit and vegetable depending on their assignment). Between the groups, the researchers found significantly more fruit and vegetable intake in the nutrition group at both eight week and six month follow-up. Within the fruit and vegetable group, higher completed MI sessions and more use of cook-book recipes correlated with significantly higher percentage of fruit and vegetable intake at six month follow-up. Research has shown that current smokers consume less fruit and vegetables and are at higher risk for cardiovascular disease and other cancers (Hung, et al., 2004). Similar to the findings in Cambell et al., 1999 and Resnicow et al., 2005, participants in this study increased more fruit consumption than vegetable consumption. Studies show that vegetables are more protective against chronic disease than fruit (Hung et al.). The authors also found that BMI did not improve over the six month trial period. The researchers suggested that nutrition was not sufficient to change weight status and

recommended that future interventions consider addressing both diet and activity components.

Smith et al., (1997) conducted a pilot study of 22 overweight women (41% African American) with non-insulin dependent diabetes mellitus. The women were randomized to one of two groups: (1) 16 week group behavioral weight control intervention and (2) the same intervention, with an additional three individual sessions of MI. The MI sessions were divided so that one occurred prior to the group treatment and two at mid-treatment. Experienced psychologists conducted the MI sessions. The sessions included individualized feedback on glycemic control to develop discrepancy between desired goals and the patient's current status. Four-month posttest found that the women in the MI group had significantly better glycemic control than the standard intervention group and were more likely to monitor their blood glucose.

In a study of 121 patients with hyperlipidemia, Mhurchu, Margetts, & Speller (1998) randomized participants into one of two groups (1) standard dietary intervention or (2) MI-based counseling. Each participant met with a dietitian for three sessions. A significant improvement in dietary habits and body/mass index was shown in both groups at the three-month follow-up. There were no significant differences for any of the main outcomes. The authors reported that the effectiveness of MI may have been limited because 80% of the participants were already making dietary changes at baseline. The participants may have been better served by a more behavioral intervention since MI is better suited for those who are resistant or ambivalent to change.

Berg-Smith et al. (1999) conducted the Dietary Intervention Study in Children (DISC). This three-year intervention began with children initially 8-10 years of age with elevated low-density lipoprotein (LDL) cholesterol. As the group aged into adolescence, an MI-based intervention was added designed to spark adherence to the prescribed diet. Masters level health educators and dieticians with 18 hours of training served as counselors for the project. Each participant received one in-person session and one follow-up session conducted either by phone or in person. Data from the first group to complete the two sessions show a significant reduction at three month follow-up, as well as an improvement in overall adherence. The adolescents reported a high satisfaction with the MI intervention.

Resnicow et al. (2000; 2001) completed a multicomponent intervention entitled, "The Eat for Life" trial. The Eat for Life (EFL) trial was a federally funded research intervention that was conducted through African American churches in metropolitan Atlanta, Georgia. The intervention was designed to promote healthy eating patterns with the specific goal of increasing the fruit and vegetable intake of the participants. The study included African American church members from mixed socioeconomic statuses. The participants were assigned to one of three treatment groups. Group (1), the comparison group, received standard materials on nutrition education, and then received culturally sensitive materials after completing their posttest one year later. Group (2) was given culturally sensitive self-help materials and one telephone cue call; and Group (3) received a cue call plus three counseling calls. The counseling calls utilized MI techniques. The MI counselors were either registered dieticians or dietetic interns. The counselors received three two-hour training sessions and were observed conducting at least two MI

phone counseling sessions prior to being certified. The counselors also received ongoing supervision from a doctoral level staff. Fruit and vegetable intake was assessed at baseline and at one-year follow-up and was measured by food frequency questionnaires. The results of this study indicate a significantly greater change in fruit and vegetable intake for group (3), the group that received the motivational interviewing counseling call compared to the other groups.

Based on the success of the EFL trial, Resnicow et al. (2002) designed a follow-up study. This second study, entitled Healthy Body Healthy Spirit (HBHS), sampled from African American churches in the Atlanta Metropolitan area. The study was aimed at testing the effectiveness of tailored self-help dietary intervention focusing on nutritional intake as well as a physical activity intervention that was different than standard health education materials. The study also examined the effectiveness of MI intervention through telephone calls targeting changes in physical activity and dietary habits.

The study had three treatment groups. Treatment 1 was the control group; they received standard government materials on diet and exercise. Treatment 2 received culturally sensitive materials on diet and physical activity. Treatment 3 received the culturally sensitive materials on diet and physical activity in addition to four MI phone calls over a one-year period. The four phone calls were broken down into two focusing on diet and two focusing on physical activity.

While the protocol for HBHS was similar to that of the EFL trial (Resnicow, et al., 2000, Resnicow et al., 2001), the addition of a physical activity component was a new aspect of the research. Further, the HBHS study utilized Masters level counseling

students as the primary MI interventionists. This is in stark contrast to the nutritionist and health educators used in the Eat for Life trial. The counseling students for HBHS received training in their school program based on the Carkhuff model (1993). The exposure to a compatible counseling style, more psychological counseling experience, and significantly more hours of MI training, as well as on going supervision by doctoral level counseling psychology students, made this group of interventionists very different. The overall results indicated a significant change in the nutrition component and slight changes within the physical activity component.

Motivational Interviewing and Physical Activity

De Blok et al. (2006) examined the effects of a lifestyle physical activity with a motivational interviewing based counseling program. The researchers followed 21 chronic obstructive pulmonary disease patients, who were randomized to an experimental group that followed a regular rehabilitation program and received an MI based counseling program delivered by physical therapists. The control group only received rehabilitation. The primary outcome of the study was that the experimental group showed a 69% increase from baseline in their amount of steps/day. The control group only showed a 19% increase. The study ultimately indicated that using motivational based counseling along with a pedometer showed clinically relevant increase in physical activity.

Ang et al. (2007) studied the effects of promoting exercise on pain and physical function in patients with fibromyalgia using MI counseling (n=19, all female). This pilot study utilized a single group intervention. In addition to an exercise prescription, participants had two supervised exercise sessions. Over a 10-week period, participants received six exercise based MI phone calls. Assessments were conducted at baseline,

immediate post intervention (week 12) and at follow-up (week 30). The pilot study found that pain severity and pain interference decreased, but depression scores on the arthritis impact measurement scale was unchanged. The authors concluded that MI phone intervention to promote exercise was successful in reducing patient's level of pain and physical impairment.

Bennett et al. (2007) found that the use of MI may increase physical activity behavior in adult cancer survivors, especially those with high levels of self-efficacy. The authors tested MI as an intervention to increase physical activity and improve aerobic fitness, health and fatigue with inactive adult cancer survivors (n=56). The participants were assigned to either control or intervention group. Participants in the intervention group received one in person MI counseling session and two follow up MI telephone calls over a six month period. The participants in the control group received two phone calls over six months with no MI content. The researchers used multilevel modeling to measure outcomes at baseline, three month and six months. Using the Community Healthy Activities Model Program for Seniors questionnaire (CHAMPS) the study found that in controlling for time since completion of cancer treatment, significant group differences in regular physical activity could be explained by the MI intervention. The intervention group also had significant findings relating to self-efficacy. Participants in the intervention group with high self-efficacy for exercise increased their exercise more than participants with lower self-efficacy for exercise at baseline. However, level of self-efficacy was not significant for physical activity change in the control group. Other outcomes including fatigue, aerobic fitness, mental and physical health did not differ significantly between groups.

Similarly, Brodie and Inoue (2005) compared a traditional exercise program and a program based on motivational interviewing over a five month period with older aged patients with heart failure (n = 60). The participants were all over the age of 65 with an average age of 79.The primary outcome was aimed at increasing physical activity. At the onset, the groups did not display any significant differences; however, the group that received the MI intervention increased reported physical activity over a short period of time. Another conclusion indicated that MI gives a better outcome than standard care, and nurses should explore other alternatives to promote health in this population. This study along with several other studies indicates that there is a relationship with a form of motivational interviewing as a primary counseling technique with physical activity.

Hillsdon, Thorogood, White, & Foster (2002) examined 1658 middle aged men and women who were randomly assigned to 30 minutes of brief negotiation or direct advice in primary care settings. The study was conducted over a 12 month period and the results indicated that the brief negotiation groups increased their physical activity more than the control groups. The brief negotiation group also produced a greater reduction in the patients overall diastolic blood pressure than direct advice.

Harland, et al. (1999) used 523 medical practice patients to evaluate the efficacy of MI for promoting physical activity. The participants were ages 40-64, lower income, sedentary but otherwise healthy individuals. There were four intervention groups: two groups received one 40-minute MI session and the other two groups received six 40-minute MI sessions delivered over 12 weeks. Vouchers for free aerobic classes were provided to approximately half of the participants in the MI groups. The control group did not receive vouchers and did not receive MI calls. At the 12-week follow-up, a

significant improvement in activity was found for the four MI groups, relative to the controls (38% versus 16%). However, there were no significant findings between the two categories of MI groups. At one year follow-up, no significant differences in physical activity were found within the MI groups or between the MI and control groups. One limitation of this study was that of the six possible MI sessions the median number of attendance in this group was three.

Conclusion

Motivational Interviewing has clearly developed an empirical research base. MI has proven effective as an intervention in encounters as brief as 15 minutes in length, and it has positive effect with multiple encounters (Rubak, et al., 2005). While MI began in the addictions field, recent literature suggests that it is also successful in the field of public health (Rubak, et al., 2005).

As stated previously, there is a national priority to increase physical activity behaviors in the American population, and a more direct initiative to decrease the health disparities between ethnic and racial minorities and their Caucasian counterparts (USDHHS, 1996). Given this directive, there is a definite need to expand the literature that addresses this issue. More specifically, a validated method is needed to help practitioners motivate clients to become less sedentary and more physically active. The author hypothesizes that MI can serve in this role. MI is promoted as a means for increasing intrinsic motivation (Miller & Rollnick, 1991). The literature suggests that MI leads to favorable behavior change outcomes, and that intrinsic motivation is the key to achieving and sustaining these outcomes, but there is no empirical research that evaluates

whether or not MI directly impacts intrinsic motivation. Thus, a closer look at this relationship is warranted.

Clinicians could benefit from a better understanding of what makes people change their behaviors. It is generally accepted that motivation is a requisite for change. However, what kind of motivation a person needs is still being debated. SDT discusses three types of motivation, intrinsic (autonomous) motivation, extrinsic (controlled) motivation and amotivation. All three types of motivation can be assessed with the TSRQ. It is hypothesized by this author that intrinsic motivation is more likely to affect changes in physical activity behaviors and that use of MI will increase a person's intrinsic motivation level.

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ABSTRACT

GETTING READY TO MOVE: EXPLORING INTRINSIC MOTIVATION AND PHYSICAL ACTIVITY IN AN AFRICAN AMERICAN CHURCH POPULATION

by
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One of the primary issues facing African Americans in the 21st century is the disparities in their health in relation to the overall U.S. society. The Surgeon General and United States government has acknowledged the health crisis African Americans face and have allocated funds through the National Center for Minority Health and Health Disparities. Though this commitment is important to change in a national context, it is equally important that African Americans find a way to engage in health behavior change at the community level. Research in the areas of public health and health psychology has shown that increases in physical activity is a primary means by which to decrease the instances of chronic, yet preventable illness among African Americans. Specifically, increases in physical activity can improve heart health and reduce the damage of cancer and diabetes to the human body. Thus, interventions that seek to address the health disparities between African Americans and members of the majority culture must address ways to get them active that make sense for social context. The current study, part of a larger National Institutes of Health (NIH) funded study named Health Body Healthy Spirit, examined the effect of a motivational interviewing intervention on increasing intrinsic motivation among an African American adult church population in order to increase their physical activity. Results indicated that African American physical activity

did not change as a result of the intervention and suggests the need for further study of the motivators for health behavior change among African Americans. Research and clinical implications are discussed.

Chapter 2

GETTING READY TO MOVE: EXPLORING INTRINSIC MOTIVATION AND PHYSICAL ACTIVITY IN AN AFRICAN AMERICAN CHURCH POPULATION

Introduction

The cases of preventable diseases and negative health conditions are rampant in the African American community (NIH, 2006). As a group, African Americans are suffering from the worst health indicators in the nation (United States Department of Health and Human Services [USDHHS], 2006). To decrease health risks, there must be a decrease in the chronic disease risk factors that overwhelmingly plague this community (USDHHS, 1996). The Surgeon General has recommended physical activity as a useful means for decreasing these risk factors, especially for preventable chronic illnesses such as diabetes and heart disease (USDHHS, 1996).

Despite the research reports, the Surgeon General's recommendations and the known benefits of physical activity, African Americans are still disproportionately inactive compared to other racial groups (USDHHS, 2002). The possible causes for this discrepancy are numerous. Environmental concerns such as: cost, safety, and traffic, lack of programs and facilities all impact participation in physical activity (King, et al., 2000). Osyerman, Fryberg and Yoder (2007) identified several cultural implications that they found impacted participation. Specifically, they found that when conducting health interventions, health and health promotion is often equated with Caucasians and the middle class. This perception had a negative impact on the perceived effectiveness of

health promoting activities in racial or ethnic minority settings, especially with African American participants.

Another contributing factor to participation in physical activity is gender. King, et al. (2000) examined barriers to participation, both personal and environmental, for women 40 years of age and older (n = 2,912). The researchers indicated that caregiving duties and lack of energy to exercise were among the top four barriers for all ethnic subgroups in the study. A number of factors were significantly associated with inactivity, they included: older age, absence of enjoyable scenery and infrequent observation of others exercising in their neighborhood. In a similar study, Kowal and Fortier (2007) also found barriers to women's participation in physical activity. The sample size was considerably smaller (n = 149), but the findings were significant. The most common barriers to physical activity were daily activities and fatigue. Interestingly, the authors found that inactive women reported higher levels of fatigue or lack of interest in physical activity than women who were active or increased their activity level during the study. Similar to King et al. (2000) environmental factors such as scenery and observation of others in the neighborhood participating in activity were both suggested as possible contributors to behavior change.

Given the high levels of preventable disease and the low levels of physical activity within the African American community, identification of barriers is only the start of a possible solution. It is also necessary to identify approaches and solutions that will work to motivate people to change African American's specifically. Health interventions and health professionals must seek to provide information and assistance in a way that is conducive to the population. Interventions must not only be valid and

reliable, but also culturally relevant (Resnicow, Jackson, & Blissett, 2005). Simply put, "If clinicians are to meet the unique needs of clients and create appealing and effective models of engagement, they need to identify, research and integrate the factors that are important to those they serve" (Añez, Silva, Paris, & Bedregal, 2008, p. 158). MI has been used as a successful intervention strategy with many different groups. (Añez et al., 2008; Resnicow et al., 2001)

Motivational Interviewing (MI) is a counseling technique originally designed to work in the treatment of addictions (Miller & Rollnick, 2002), MI has more recently been used in health promotion and chronic disease prevention (Ang, Keavalu, Lydon, Lane, & Bigatti, 2007; Bennett, Lyons, Winters-Stone, Nail, & Scherer, 2007; Brodie & Inoue, 2005; Resnicow et al., 2002; Smith, Heckemeyer, Kratt, & Mason, 1997; Stott, Rollnick, & Pill, 1995; Taplin et al., 2000; Velasquez et al., 2000). Motivational Interviewing is a mix of techniques and principles from psychotherapy and behavior change theory. The goal of MI is to elicit intrinsic motivation for behavior change. Practitioners work with their patients or clients to explore discrepancies between their values and behaviors while helping to resolve their ambivalence to change (Miller & Rollnick, 2002). MI may be particularly effective for persons who are initially at a low readiness to change (Butler et al., 1999; Heather et al., 1996; Miller & Rollick, 2002; Resnicow et al., 2002). Positive results have been found using MI as an intervention tool for various health related outcomes including: diet and physical activity (Berg-Smith et al., 1999; Mhurchu, Margetts, & Speller, 1998; Resnicow, et al., 2001, 2005;Smith et al., 1997), smoking cessation (Butler et al., 1999; Colby et al., 1998; Erchoff et al. 1999; Glasgow et al., 2000; Velasquez et al., 2000) and substance abuse treatment (Burke, Arkowitz, Dunn,

2002; Dunn, Deroo, & Rivera, 2001). Meta analyses have also supported the efficacy of MI (Burke, Arkowitz, & Menchola, 2003; Knight, McGowan, Dickens, & Bundy, 2006; Rubak, Sandboek, Lauritzen, & Christensen, 2005).

The MI style is non-judgmental, empathic and encouraging; it prompts the participant to do most of the psychological work. It was developed as a way to help people work through ambivalence and move toward change (Rollnick, Mason, & Butler, 1999).The client is supported through the change process in a safe and supportive environment. The client is encouraged to explore their ambivalence, including discussing the pros and cons of possible behavior change. Sessions often include a discussion of client values, for the purpose of connecting things that are intrinsically important to the client with behaviors they want to change. The practitioner avoids giving advice or telling the client what to do. Rather, emphasis is put on understanding the discrepancy between the client's personal goals and their current actions. The practitioner works to understand the client's point of view and reflects this information back to the client. The essence of MI is to stimulate the client's own intrinsic motivation, so that the desire to change is internally derived as opposed to externally imposed (Miller & Rollnick, 2005). For researchers and practitioners aspiring to be culturally competent, it is not only the technique that they use, but also how their intervention is delivered that matters (Añez et al., 2008). For African Americans, the church has been identified as an appropriate intervention site for the role it plays as a trusted institution in the community (Resnicow, et al., 2001; Yanek, Becker, Moy, Gittelsohn, & Koffman, 2001).

The church has long been an important cultural and religious structure in the African American community; it stands as a pillar for social support and community

leadership (Yanek et al., 2001). Because the Black church is often engaged in health services through programs and committees, as well as promoting health as a part of their ministry, it is a prime location for the dissemination of health information to this target population (Resnicow et al., 2001). Anderson, Wojcik, Winett and Williams (2006) tested a social-cognitive model of physical activity (n=999) with a church based population in the southern United States. The authors found that physical activity levels were influenced by age, race, social support, self efficacy and self-regulation, while outcome expectations had no significant impact. Many African American churches have parishioners from diverse economic backgrounds. This range of socio-economic statuses including middle to upper class is frequently underrepresented in health promotion studies, and thus makes the church an appropriate site for securing a more representative sample of African Americans. The African American church has proven to be a beneficial environment for researchers trying to access African American participants from the higher ends of the economic spectrum. Access to African American research participants through the church has proven effective for participant recruitment and tracking as well (Resnicow et al.).

Securing willing participants is not enough; having culturally relevant intervention tools that address surface and deep structures are also key (Resnicow, Soler, Braithwaite, Ahluwalia & Butler, 2000). This includes the use of print materials that match the race of the participants, music, recipes and quotes that are relevant and relatable to the group.

In one of the first studies that utilized both behavior change strategies on nutrition combined with MI intervention, Resnicow et al. (2001) conducted an intervention that

was intended to increase the intake of fruit and vegetables with African American church members in the Atlanta Georgia area. This intervention, called the Eat for Life Trial (EFL), had three treatment groups: (1) a control group that received standard health literature, (2) a culturally sensitive self-help group that received one telephone cue call and (3) an MI intervention group, who received all the same components as group two, but with the addition of three counseling phone calls. The telephone cue calls received in group two and three were calls designed to trigger use of the materials. The counseling phone calls received only by group three, included MI counseling techniques targeting a change in fruit and vegetable consumption. The study found change in fruit and vegetable intake was significantly greater in the group receiving an MI intervention compared to the comparison and self-help group, suggesting that the use of MI as a means for changing dietary behaviors had merit.

In a follow-up study to the EFL trial, Resnicow et al., (2005) conducted a multicomponent intervention to increase both fruit and vegetable intake and physical activity. The intervention was called Healthy Body Healthy Spirit (HBHS) and was delivered through 16 Black churches in Atlanta, Georgia. The churches were randomly assigned to three intervention categories. The study recruited 1056 participants at baseline and had an 86% retention rate at one-year follow-up. Similar to the EFL trial, there were three treatment groups. Group one received standard educational materials, group two received self-help nutrition and physical activity materials that were culturally targeted, and group 3 received all the group two materials plus four MI phone calls over the course of a 12 month period. At one year follow-up significant increases to fruit and vegetable intake and physical activity were found for groups two and three. MI had an

additive effect on fruit and vegetable consumption, but not on physical activity behavior. The study reinforced the use of MI in nutrition counseling, it created more questions about how to increase physical activity and it gave credence to the use of culturally targeted materials in the promotion of health behavior change with African Americans.

In a meta-analytic literature review, Griner and Smith (2006) found that when attention was paid to cultural context and values and when culturally modified for a specific group, mental health treatments were four times more effective. The aforementioned literature seems to suggest that the same is true for health behavior interventions. As a treatment intervention, Motivational Interviewing has been used successfully in a number of diverse participant settings (Brodie & Inoue, 2005; Burke, Arkowitz & Menchola, 2003; Fuemmeler et al., 2006). The use of MI for change in health behaviors has shown to be significant in both EFL and HBHS (Resnicow et al., 2001, 2005) but it did not fully explain why MI is influential in effecting change. It has been posited that MI helps to foster and increase a person's intrinsic motivation, promoting self-efficacy and leading to successful change strategies (Miller & Rollnick, 1991).

The research suggests that favorable behavior outcomes are related to a person's intrinsic motivation (Deci & Ryan, 2008). Looking at a subset of pre and post test data from the HBHS intervention, the author explored the nature of the relations between participant intrinsic motivation and physical activity. Important findings regarding gender and physical activity have indicated African American women an especially at risk group (Crespo et al., 1999; Crespo et al., 2000). Thus, the current study explored the effect of gender on intrinsic motivation change scores. Although the HBHS study did not identify

gender as a predictor, examination of these gender effects can have significant implications for health and wellness interventions for African American women.

MI has been deemed successful because it is believed to increase a person's intrinsic motivation (Deci & Ryan, 2008; Miller& Rollnick, 2002). The current study sought to explore this relationship through comparison of the baseline and post test scores of intrinsic motivation among participants in MI and non-MI treatment groups. More precisely, I was interested in whether intrinsic motivation mediates changes observed in the MI group. Moreover, it determined if the MI treatment group had a larger increase in physical activity levels than the other two treatment groups. Specifically, the following research questions guided this inquiry.

Question 1: Does baseline intrinsic, extrinsic, amotivation motivation correlate (zero or higher order of covariates) with change in physical activity?

Question 2:

a. Does intrinsic, extrinsic, amotivation motivation change from baseline to follow up for control group and for MI group?
b. Does intrinsic, extrinsic, amotivation motivations significantly differ in the control group vs. MI group at baseline and post-test?

Question 3: Where change in motivation is significant, do change scores of the intrinsic, extrinsic and amotivation motivation predict change in physical activity in the full, control sample, and the MI sample?

Question 4: Does baseline intrinsic motivation predict significantly more variance in physical change than does extrinsic or amotivation motivation?

Question 5: Does change in motivation mediate the effect of MI on physical activity?

Method

Procedure

The Healthy Body Healthy Spirit (HBHS) Program is a follow-up study to the Eat for Life trial described earlier (Resnicow, et al., 2000). Healthy Body Healthy Spirit recruited participants from African American churches in the Atlanta metropolitan area. The purpose of the intervention was to increase fruit and vegetable intake and physical activity levels among the participants. There were three treatment groups. Treatment group 1 received standard materials about physical activity and nutrition. Treatment group 2 received culturally sensitive physical activity and nutrition materials. Treatment group 3 received culturally sensitive physical activity and nutrition materials, along with four MI phone calls. Masters level professional counseling students conducted the MI phone counseling sessions. The counseling students underwent over 40 hours of training in Motivational Interviewing by two doctoral level counseling psychology students who were certified by the Motivational Interviewing Network of Trainers (MINT, 2008). The MINT is an international collective of trainers in motivational interviewing and related methods (e.g., behavior change counseling, brief advice). Masters level student counselors were provided a script to guide their discussion and documented client stated barriers to change, motivation and confidence level scores and client stated values on a data sheet. These data were used to facilitate the current and subsequent MI counseling session, as well as to document the phone session interaction and behavior change over the course of the one year study.

Participants

Participants were African American adults, who participated in the Healthy Body Healthy Spirit intervention program at their church. They were selected from an African American church population in a large, metropolitan city in the Southeast United States. Church liaisons were interviewed to determine the size, racial make-up and income level of the church members as well as to facilitate participant involvement at the church site. The following criteria were used to select participants: 1) adults between the ages 18-72; and 2) members of middle to upper socioeconomic status church congregations. Participants were recruited by a church liaison or from their attendance at a health fair held at their church.

All data were maintained through the use of identification numbers. The participants' personal information (i.e., name, phone number, address) was accessible to callers on their calling sheets, but the responses and the aforementioned identification number were compiled and their survey history was stored in a restricted access computer database. Participants were treated in accordance with the ethical standards and guidelines of the American Psychological Association.

Instruments

All participants were required to fill out a pre and post health survey. The pre survey was completed prior to their participation in the first health fair and documented baseline health behavior and attitude information. The post survey was completed prior to participating in the follow-up health fair one-year later. The survey included demographic questions (i.e., age, race, ethnicity, household income, and education level) and also

includes the Treatment Self-Regulation Questionnaire (TSRQ, n.d.) and the Community Healthy Activities Model Program for Seniors (CHAMPS), among other measures aimed at measuring Fruit and Vegetable intake, which was a separate construct not included in this study.

Intrinsic Motivation. Intrinsic motivation was assessed by the TSRQ (n.d). The TSRQ is a set of questionnaires that measure the degree to which a person's motivation for a particular behavior is autonomous. The wording on each version of the questionnaire is slightly different to account for different behaviors being investigated. For instance, reasons for changing a health behavior may be different from reasons for entering in to addictions treatment. The results all fall along the autonomy continuum and are comparable. The measure has three subscales: (1) the autonomous regulatory style, (2) the controlled regulatory style, and (3) amotivation. These are all related to motivational concepts derived from the Self-Determination Theory (Ryan & Deci, 2000). The autonomous style is considered the most self-determined form of motivation [intrinsic] and is routinely linked with maintained behavior change and positive health-care outcomes.

The three subscales on the TSRQ have been found to have good construct validity in numerous studies (Pelletier, Tucson, & Haddad, 1997; Ryan & Connell; 1989; Ryan, Plant, & O'Malley, 1995; Williams, Cox, Kouides, & Deci, 1999; Williams, Freedman, & Deci, 1998; Williams, Grow, Freedman, Ryan, & Deci, 1996; Williams, Rodin, Ryan, Rollick, & Deci, 1998; Zeldman, Ryan, & Fiscella). On a combined data set from four studies (n=638) of patients who had completed the questionnaire, factor analysis with oblique rotation was performed (Williams, Ryan, & Deci, 1999). Williams et al., (1999)

reported that the TSRQ yielded distinct factors with no cross loadings greater than .24 and alphas ranging between .78-.90 across all three subscales across four independent studies. Levesque, et al., (2007) provided further evidence of the validity of the TSRQ as an assessment tool in health behavior change. The authors examined the validity of the TSRQ across four different health settings and three health behaviors (tobacco, diet and exercise) with 2731 participants completing the TSRQ. Validity was found across all settings and behaviors through invariance analysis. Internal consistency of each subscale was acceptable with most α values >0.73.

Assessment of Physical Activity. In this study, the Community Healthy Activities Model Program for Seniors (CHAMPS) was utilized at baseline and post-test as a self-report measure. Prior studies have reported adequate validity for CHAMPS (Stewart, Mills, King, Haskell, Gillis, & Ritter, 2001; Harada, Chiu, King, & Stewart, 2001; Young, Lee, & Appel, 2001). This instrument was originally designed to evaluate a largely sedentary population. The physical activity recall assesses the frequency and duration of activities that are generally conducted by an elder population. Based on focus group response and pilot testing of the instrument, the CHAMPS was modified (Resnicow et al., 2005). The modified CHAMPS instrument was scored to yield three indices of activity: total minutes per week; minutes of moderate to vigorous physical activity (MVPA), defined as those with a metabolic equivalent task (MET) value of 3.0; and intentional exercise activities that were based on a compilation of sports-related or exercise activities that were not considered part of the participants daily activities (Resnicow et al., 2005).

The CHAMPS was originally tested on a sample of n=249. Test-retest reliability was conducted at a six month follow-up. Reliability was found with coefficients ranging from .60 to .69 for the six measures (Stewart, Millis, King, Haskell, & Gillis, 1999). Stewart et al. (1999) indicated that all measures discriminated between sedentary, low active and active activity levels at statistically significant levels ($p < .001$). Further, construct validity with five other measures of physical functioning and other health related concepts substantiates the CHAMPS as a physical health outcome measure.

Preliminary Analyses

Pre-analysis: Does intrinsic, extrinsic, amotivation and physical activity level at baseline differ significantly across gender, age or SES? (note if yes, this will be co varied across analysis).

Preliminary analyses were conducted to assess the impact of attrition. Those with complete data (Baseline & Follow-up) were compared to those who had a baseline only. For categorical variables (gender, marital status, income, and education), a Chi-square statistic was used to determine whether the distribution across categories was different in the three groups. For those variables assumed to be continuous (age, fruit & vegetable intake, physical activity and motivation), one-way ANOVA was used to determine whether the means differed. Prior to conducting the primary analyses, correlational analyses were conducted to assess the association between baseline measures of motivation and physical activity and demographic characteristics (gender, age, SES education and income) in order to identify potential covariates. Since this was a cluster-randomized trial, the primary hypotheses were tested using the SAS PROC MIXED

procedure which allows one to account for the nesting of individuals within churches which are in turn nested within treatment group. F and t statistics were used to test hypotheses related to change over time and hypotheses related to group differences.

Preliminary Results

At baseline, 1040 participants returned the survey. These participants were distributed across 16 churches with the average number of participants per church being 65 (range= 39-88). Each church was randomly assigned to one of the three intervention conditions. There were five churches with 296 participants in the comparison group (C), six churches in with 371 participants in treatment group 1 (Self-help (SH)), and five churches with 373 participants in treatment group 2 (Self-help +MI (SHMI)). Of the initial sample, 893 completed the follow-up survey. Specifically, the follow up rates were 88% for the control group, 88% for treatment group 1 and 82% for treatment group 2.

The individuals that did not complete the follow-up survey did not differ from those who did with regard to gender ($\chi^2(1)=.005$, p=.942), marital status ($\chi^2(1)=4.531$, p=.210), fruit & vegetable intake (t(1031)=.152, p=.879), and physical activity [CHAMPS activity measure- All activities(t(977)=.971, p=.332), Moderate Activities (t(977)=1.473,p=.141), Exercise Activities (t(977)=.411, p=.681)], or motivation (autonomous (t(910)=-.856,p=.392), controlled (t(910)=-.406,p=.685), amotivation (t(910)=-.469,p=.639). Those failing to complete the follow-up survey did differ with respect to age (t(1013)=-3.633, p<.001), income ($\chi^2(3)=10.618$,p=.014), and education ($\chi^2(3)=9.481$,p=.024)). Participants not completing the follow-up survey tended to be significantly younger (M (SD)= 42.0 (13.0) vs. 46.4 (13.2)) and come from a lower

income and education category. The three treatment groups displayed differential attrition on only one variable, the score on amotivation (F (2,906) =4.818, p=.008). Participants failing to complete the follow-up in the treatment groups tended to have higher scores on the measure of amotivation than those in the comparison group. The difference was statistically significant for the C and SHMI comparison (p=.022), but not for the C and SH comparison (p=.097). The non-completers from the two treatment groups did not differ on this variable. A Sidak adjustment for multiple comparisons was used to obtain p-values.

As shown in Table 1, the cohort for this study was predominantly female (76.6%) with a mean age of 46.4 years. Approximately 53% of the sample was married or living with a partner. The sample had a relatively high level of education with 46% reporting completion of college or higher and a little more than 70% reporting at least some college. For those reporting income (n=745), a little over 60% indicated a yearly income greater than or equal to $40,000. At baseline, the three treatment groups did not differ on any of the variables reported in Table 1.

Table 1

Baseline description of all Healthy Body Health Spirit participants completing the baseline and follow-up surveys.

Variable	Group				
	Comparison (n=259)	Self-help (n=328)	Self-help + MI (n=306)	Total (N=893[1])	Tests for Baseline Group Differences

Age (years)					F(2,866)=.28,p=.757
M	46.5	45.8	46.8	46.4	
SD	13.4	12.8	13.6	13.2	
Range	18-85	18-80	18-86	18-86	
Gender					$\chi^2(2)=1.46,p=.481$
%female	74.1	76.8	78.4	76.6	
%male	25.9	23.2	21.6	23.4	
Marital Status					$\chi^2(2)=.08,p=.961$
%married or living with partner	51.8	52.6	53.0	52.3	
Income (%)					$\chi^2(6)=6.28,p=.393$
<$20,000	10.2	12.3	11.2	11.3	
$20,000-39,999	25.3	23.4	30.1	26.3	
$40,000-79,999	46.2	45.6	37.5	43.0	
>=$80,000	18.2	18.8	21.2	19.5	
Education (%)					$\chi^2(6)=9.54,p=.145$
<High school	4.0	2.6	2.4	2.9	
Completed HS or voc.	30.9	21.2	26.9	26.0	
school	24.1	25.5	25.9	25.2	
Some college	41.0	50.7	44.9	45.8	
Completed college or higher					
Fruit & Vegetable Intake (servings per day)					
2-item questionnaire					
M	3.8	3.6	3.7	3.7	
SD	1.7	1.8	1.8	1.8	
Champs activity (min per week)					
All activities					F(2,883)=.61,p=.543
M	877.1	797.9	820.3	829.1	
SD	702.4	723.3	712.5	713.3	
>=3 METs					F(2.839)=.88,p=.566
M	456.5	415.1	427.5	431.6	
SD	472.8	454.3	457.1	460.6	
Exercise activities					F(2,839)=.57,p=.566
M	196.6	177.2	176.2	182.6	
SD	288.9	276.7	265.4	276.4	
Motivation					
Autonomous (internal)					F(2,839)=.46,p=.633
M	5.9	5.9	5.9	5.9	
SD	1.2	1.2	1.1	1.1	
Controlled					F(2,785)=3.1,p=.046[2]
M	2.7	2.4	2.7	2.6	
SD	1.4	1.3	1.4	1.4	
Amotivational					F(2,785)=1.9,p=.140
M	2.3	2.1	2.2	2.2	
SD	1.4	1.3	1.4	1.4	

[1]N is less than 893 for some variables.

[2] Based on Sidak adjustment for multiple comparisons, treatment 1 and control group were marginally different (p=.056)

For the primary study variables, motivation and physical activity, some participants were missing values for these variables at either baseline or follow-up because of an incomplete survey. For the physical activity variables (CHAMPS), 834 (93%) of the 893 cases had values at both baseline and follow-up. For the motivation variables, 749 (84%) of the 893 cases had values at both baseline and follow-up. Approximately 81% (725) of the sample had baseline and follow-up values for both the physical activity and motivation variables. The percent of those having complete data (values at baseline and follow-up) was the same across the three treatment groups (χ^2(2)=1.172,p=.557). However, those with complete data tended to be younger (45.5 yrs vs. 50.8 yrs, t(876)=4.748, p<.001) and single (χ^2(3)=30.096, p<.001) . They also reported higher levels of education (χ^2(3)=29.246, p<.001), being more physically active (All activities: t(840)=-3.305, p=.001; Moderate activities: t(840)=-3.549, p<.001; Exercise activities: t(840)=-3.894, p<.001), and higher autonomous motivation (t(786)=-4.570, p<.001) and lower amotivation (t(786)=2.003, p=.045). The baseline characteristics of participants with complete data on the primary variables are presented in Table 2. The three treatment groups did not differ at baseline on any of the variables included in Table 2.

Table 2

Baseline description of Healthy Body Health Spirit participants with complete motivation and physical activity data.

Variable	Group				
	Comparison (n=216)	Self-help (n=263)	Self-help + MI (n=246)	Total (N=725)	Tests for Baseline Group Differences

Age (years)					F(2,714)=.15,p=.864
M	45.8	45.2	45.3	45.4	
SD	13.1	12.4	12.9	12.8	
Range	18-81	18-80	18-80	18-81	
Gender					$\chi^2(2)=1.49,p=.473$
%female	73.6	77.6	78.0	76.6	
%male	26.4	22.4	22.0	23.4	
Marital Status					$\chi^2(2)=.05,p=.976$
%married or living with partner	52.4	53.3	53.3	53.0	
Income (%)					$\chi^2(6)=11.6,p=.071$
<$20,000	9.4	13.2	8.5	10.5	
$20,000-39,999	24.6	21.9	31.1	25.8	
$40,000-79,999	47.1	46.1	36.3	43.1	
>=$80,000	18.8	18.9	24.1	20.6	
Education (%)					$\chi^2(6)=10.4,p=.109$
<High school	2.4	1.9	0.8	1.7	
Completed HS or	31.3	20.0	24.6	24.9	
vocational school	21.8	28.5	26.7	25.9	
Some college	44.5	49.6	47.9	47.5	
Completed college or higher					
Fruit & Vegetable Intake (servings per day)					F(2,718)=.81,p=.446
2-item questionnaire					
M	3.8	3.6	3.8	3.7	
SD	1.7	1.8	1.8	1.8	
Champs activity (min per week)					
All activities					F(2,722)=.99,p=.370
M	896.2	812.1	883.9	861.6	
SD	708.5	711.8	730.7	717.4	
>=3 METs					F(2,722)=.97,p=.379
M	477.6	422.5	467.3	454.1	
SD	486.1	446.0	474.5	467.9	
Exercise activities					F(2,722)=.67,p=.511
M	215.1	184.8	195.2	197.4	
SD	304.3	278.3	278.2	286.1	
Motivation					
Autonomous (internal)					F(2,722)=.09,p=.918
M	6.0	5.9	6.0	6.0	
SD	1.2	1.1	1.1	1.1	
Controlled					F(2,722)=2.5,p=.082
M	2.7	2.4	2.7	2.6	
SD	1.4	1.3	1.4	1.4	
Amotivational					F(2,722)=2.3,p=.098
M	2.4	2.1	2.2	2.2	
SD	1.4	1.3	1.4	1.4	

Results

Analysis

Preliminary correlational analyses were conducted to investigate whether motivation variables (autonomous, controlled, amotivation) and activity variables (all, moderate, exercise) as measured at baseline were related to gender, age or socio-economic status (education & income). This analysis was conducted to identify potential covariates for the primary analyses. Spearman's rho was used to accommodate the ordinal nature of education and income. Correlations between study variables at baseline are presented in Table 3. Age and baseline activity level showed a weak but statistically significant negative association. Age was not related to any of the baseline measures of motivation. The correlation coefficients indicate some differences between males and females for moderate activities, motivation - controlled response, and motivation – amotivational response. Females are somewhat less active (All activities – 828 minutes per week vs. 969 minutes per week for males) and have lower controlled response ($\underline{M}_{female}$=2.5 vs $\underline{M}_{male}$=2.9) and amotivational response scores ($\underline{M}_{female}$=2.1 vs $\underline{M}_{male}$=2.4). Education level and income level are both weakly related to motivation – autonomous response with higher levels of both being associated with higher scores on the autonomous response scale. Education level was also weakly and negatively associated with amotivational response. Those with higher education levels tended to have lower amotivational response scores. The autonomous response scale was weakly related to the other two motivation scales. It was positively associated with the controlled response scale and negatively associated with the amotivational scale. Scores on the controlled response scale and the amotivational scale were moderately and positively related.

Autonomous response was positively related (.18-.20) to the measures of physical activity. Controlled response and amotivational response were not related to activity.

Table 3

Baseline correlations (Spearman's rho) between study variables.

	1	2	3	4	5	6	7	8	9	10
1. Age	1.00									
2. Gender (0=male, 1=female)	.00	1.00								
3. Education level	-.03	.01	1.00							
4. Income	.03	-.08*	.33**	1.00						
5. Motivational scale (PA) - autonomous response	.04	.00	.07*	.10*	1.00					
6. Motivational scale (PA) – controlled response	.06	-.14**	-.04	.07	.16**	1.00				
7. Motivational scale (PA)- amotivational response	.02	-.09*	-.09*	-.05	-.15**	.43**	1.00			
8. All Activities (min per week)	-.09*	-.05	.02	.01	.18**	.05	.02	1.00		
9. Moderate Activities (>=3 METs)	-.10**	-.12**	.04	.06	.19**	.06	-.01	.91**	1.00	
10. Exercise Activities	-.16**	-.06	.04	-.04	.20**	.08*	.01	.64**	.66**	1.00

*p< 0.05 (2-tailed).

** p< 0.01 (2-tailed).

Additional correlational analyses were conducted to determine whether baseline motivation variables were associated with change in activity. The relationships between change variables (motivation and physical activity) and baseline demographic and motivation variables are included in Table 4. Age was not related to any of the variables

of interest. Gender was weakly (absolute value of coefficient ranging from .09 to .14) related to controlled and amotivational responding at baseline and change in controlled and amotivational responding. At baseline, being female was weakly associated with lower controlled and amotivational responding. Being female was also weakly associated with greater change in autonomous and controlled responding. In addition, a higher education level was associated with lower amotivational values at baseline.

Table 4

Correlations (Spearman's rho) between baseline motivation variables and change score for motivation and physical activity.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Age	1.00											
2. Gender (0=male, 1=female)	.00	1.00										
3. Education Level	-.03	.01	1.00									
4. Motivational scale (PA) - autonomous response	.04	-.001	.07	1.00								
5. Motivational scale (PA) – controlled response	.06	-.14**	-.04	.16**	1.00							
6. Motivational scale (PA)- amotivational response	.02	-.09*	-.09*	-.15**	.43**	1.00						
7. Δ Autonomous response	-.01	.10**	-.012	-.51**	-.10**	.03	1.00					
8. Δ Controlled response	.01	.09**	.002	-.12**	-.51**	-.27**	.12**	1.00				
9. Δ Amotivational	.00	-.04	-.01	-.01	-.22**	-.59**	-.11**	.43**	1.00			

response												
10. Δ All Activities (min per week)	.03	.04	-.045	-.03	-.056	-.01	.04	.06	.11**	1.00		
11. Δ Moderate Activities (>=3 METs)	.043	.04	-.03	-.02	-.04	.043	.03	.06	.08	.88**	1.00	
12. Δ Exercise Activities	.02	.06	-.06	.00	-.05	-.03	-.01	.06	.12**	.65**	.65**	1.00

*p< 0.05 (2-tailed).

** p< 0.01 (2-tailed).

Pre and post test means along with change means for physical activity and motivation are reported in Table 5. Change scores were calculated by subtracting the pre from the post scores; this analysis was done for the activity and motivation variables. For all three physical activity variables (all activities, moderate activity and exercise activity), the three treatment groups had similar means (minutes per week) at baseline, i.e., there were no statistically significant differences between the groups. For moderate and exercise activities, there were group differences. For moderate activities, t1 (Self-Help) and t2 (Self-Help + MI) had significantly higher means at posttest adjusted for baseline compared to the control group. For exercise activities, t2 had a significantly higher mean compared to the control group. In terms of the three physical activity motivation variables, the groups did not differ statistically at either baseline or follow-up.

The effect sizes (Hedge's g) were computed for post test and delta (Δ) pairwise comparisons. Using standard conventions, an effect size of .20 would be considered small, one of .50 would be considered moderate, and one of .80 would be considered large. As noted in Table 5, effect sizes for change in physical activity variables ranged from .23 to .36 for treatment and control group comparisons. Effect sizes for self –help

and MI comparisons were all very small, ranging from -.10 to .12. In terms of change in the motivation variables, the effect sizes were very small for the autonomous variable with somewhat larger effects noted for the controlled and amotivation variables.

Table 5

Means, standard errors, effect sizes and tests of group differences for physical activity and motivation.

	Comparison (C) n=216	Self-help (SH) n=263	Self-help + MI (MI) n=246		Effect Sizes (Hedge's g) for Post and Δ for Pairwise Comparisons		
Physical Activity	Mean(SE)	Mean(SE)	Mean(SE)	Test of Group Differences	SH-C	MI-C	MI-SH
All Activities							
Pre	871.5(55.6)	786.3(50.6)	860.0(53.3)	F(2,13)=.79, p=.475			
Post	829.7(55.2)	966.0(50.2)	984.6(52.7)	F(2,13)=2.44, p=.126	.20,	.24,	.03
Δ	-42.2 (56.6)	177.0 (51.5)	124.5(53.8)	F(2,13)=4.36, p=.036	.31,	.23,	-.06
				SH vs C, t(13)=2.87, p=.013			
				MI vs C, t(13)=2.13, p=.052			
Moderate							
Pre	451.9(36.6)	403.4(33.4)	447.8 (35.2)	F(2,13)=.62, p=.555			
Post	411.6(32.4)	530.7(29.4)*	519.7(30.7)*	F(2,13)=4.35, p=.036	.28,	.26,	-.02
Δ	-42.8(33.2)	123.3(30.1)	71.3(31.1.7)	F(2,13)=7.05, p=.008	.36,	.23,	-.10
				SH vs C, t(13)=3.71, p=.003			
				MI vs C, t(13)=2.51, p=.026			
Exercise							
Pre	197.7(24.7)	170.6(22.5)	183.8(23.9)	F(2,13)=.33, p=.726			
Post	179.1(21.9)	219.8(19.9)	264.5(21.0)*	F(2,13)=3.98, p=.045	.16,	.33,	.16

Δ	-19.5(23.4)	47.8(21.3)	80.2(22.4)	F(2,13)=4.88, p=.026 SH vs C, t(13)=2.12, p=.053 MI vs C, t(13)=3.07, p=.009	.26, .35, .12
Motivation					
Autonomous					
Pre	5.98(.095)	5.94 (.087)	5.98 (.091)	F(2,13)=.06, p=.944	
Post	6.05(.087)	6.06 (.079)	5.97 (.083)	F(2,13)=.32, p=.734	.01, -.08, -.08
Δ	.075	.11	-.012	F(2,13)=.76, p=.489	.04, -.08, -.11
95%CI Δ	-.098,.247	-.042,.271	-.174,.151		
Controlled					
Pre	2.68(.130)	2.45(.119)	2.67(.126)	F(2,13)=1.09, p=.365	
Post	2.52(.092)	2.67(.083)	2.85(.087)*	F(2,13)=3.33, p=.068	.11, .25, .14
Δ	.149	.224	.179	F(2,13)=2.46, p=.125	.28, .23, -.03
95%CI Δ	-.436,.139	-.038,.486	-.098, .457		
Amotivation					
Pre	2.38(.161)	2.12(.146)	2.18(.157)	F(2,13)=.76, p=.488	
Post	2.05(.137)	2.17(.125)	2.14(.133)	F(2,13)=.19, p=.826	.09, .10, .01
Δ	-.326	.043	-.032	F(2,13)=1.68, p=.224	.24, .18, -.04
95%CI Δ	-.659,.008	-.261,.347	-.355,.290		

*Group differed at p<.05 from comparison group at that time point based on t(13).

Since there really is no baseline relationship and there is no change in motivation, the mediation hypothesis cannot be tested. While there was a statistically significant change in physical activity for the two treatment groups compared to the control group,

there was no change in the motivation variables for the three groups. Given this scenario, the testing of a mediation hypothesis using the change variables may not be reasonable. However, in an exploratory analysis, baseline autonomous responding was marginally associated with amount of change in exercise activity. Treatment condition remained a statistically significant predictor. See Table 6 for regression estimates.

Table 6

Exploratory analysis results with baseline motivation variables as predictors on change in exercise activity minutes.

Effect	Estimate	Error	df	T	p-value
Intercept	-170.47	102.64	13	-1.66	.121
Condition (SH)	124.65	45.66	13	2.73	.017
Condition (MI)	103.79	44.80	13	2.32	.038
Condition (C)	0				
BL Autonomous	28.22	15.83	684	1.78	.075
BL Controlled	-20.82	14.97	684	-1.39	.165
BL Amotivation	4.81	15.11	684	.32	.750

Although not part of the original research questions, additional analyses were conducted to explore possible moderation effects in the study. An exploratory examination of the interaction effect between baseline motivation and treatment was conducted. While there was no interaction effect between the control group or the MI treatment group to any baseline motivation scale, there was an effect between baseline amotivation and treatment group. The findings show that the control group had negative change with those with a high amotivation score at baseline declining the most. In the MI

group, those who had high amotivation at baseline seemed to change the most, followed by those with moderate amotivation. In the self-help group, those with low amotivation at baseline changed the most.

Figures 1 and 2 show the interaction effect for baseline amotivation and treatment group. They are graphs of the same thing just switching the line designation. Figure 1 illustrates that the control group had negative change with those with a high amotivation score at baseline declining the most. In the MI group, those who had high amotivation at baseline seemed to change the most, followed by those with moderate amotivation. In the self-help group, those with low amotivation at baseline changed the most. In Figure 2, the effect of the MI treatment increased as the level of baseline amotivation increased. However, for both the self help and control groups it looks like the greatest effect was for those who had low amotivational scores to begin with.

Figure 1

Interaction effect between baseline motivation and treatment group on change in exercise time with treatment group on the x axis.

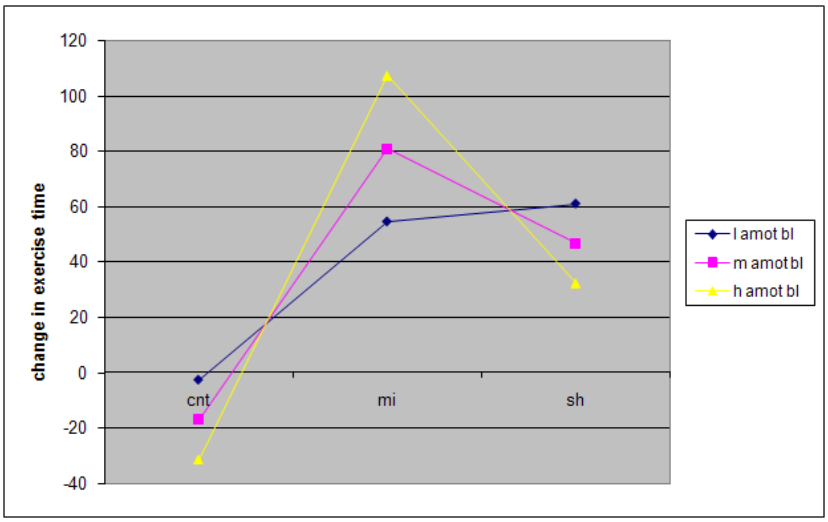
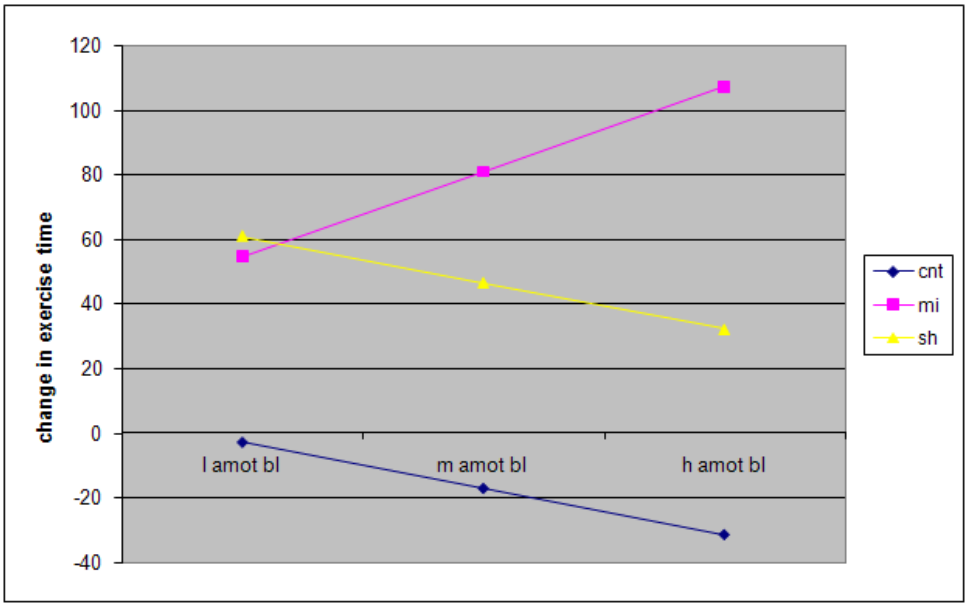


Figure 2

Interaction effect between baseline motivation and treatment group on change in exercise time with level of baseline motivation on the x axis.



Discussion

The current study sought to explore the influence of motivation on physical activity among African American participants in a church sample. While answers to the research questions yielded limited positive findings, these null findings can nonetheless inform future research. A discussion of the study findings and implications for clinical practice and research follow. Also included in the discussion are some additional findings outside of the research questions that proved worthy of inclusion.

The first research question explored the relationship between baseline intrinsic, extrinsic and amotivation scales on the TSRQ and changes in physical activity. It is on the motivation changes anticipated in these findings that the subsequent analysis was based and thus made this question a seminal aspect of this work. There was no significant relationship between motivation and change scores in physical activity. The groups did

not differ statistically at baseline or follow-up on the three physical activity motivation variables. Thus all consequent questions exploring the nature of this change could not be explored. Specifically, question three which focused on the predictive power of motivation type on the sample (i.e., full sample, control and treatment groups); question four, which sought to compare the strength of intrinsic motivation as a predictor of physical activity change over extrinsic and amotivation change; and question five which sought to explore motivation type as a mediator of the relationship between motivational interviewing (MI) and physical activity change. Again, because these questions sought to explore the nature of the anticipated, though unobserved change in motivation amongst the sample it was not possible to perform the corresponding statistical analysis. In previous literature, autonomous motivation has been found to play a significant role in change behavior including: positive behavioral, affective and cognitive outcomes (Biddle, Soos, & Chatzisarantis, 1999), maintenance of change behaviors (Deci & Ryan, 1991), improved glycemic control and dietary self-care in diabetes patients (Senecal, Nouwen, & White, 2000); and prediction of smoking cessation (Williams, Gagné, Ryan, & Deci, 2002). It was anticipated that the same would be found in this study. With no change in motivation variables, this study challenges the idea that intrinsic motivation is a strong impetus for change. One possible factor that may have contributed to this lack of significant change was the high levels of autonomous motivation at baseline. With mean scores near six on a seven point scale (control group = 5.98, self-help =5.94, and MI = 5.98), there was little room for growth or change in autonomous motivation.

The second research question explored whether the level of motivation type (i.e., intrinsic, extrinsic, and amotivation) changed from baseline to follow-up. This inquired

about changes within the control and treatment groups as well as between them. Statistically significant changes in type of motivation were not found within or between the control and treatment groups. Though significant physical activity changes were observed in the treatment groups when compared to the control group, no change was observed in the motivation variables for any of the groups. Even in the MI treatment group, with the addition of personal phone calls from trained Master's level counseling students to discuss goals, barriers, values and action plans, motivation levels did not change significantly. These results were surprising and run contrary to findings in other studies where counselors had a positive influence on patient autonomous motivation for physical activity (Fortier, Sweet, O'Sullivan & Williams, 2007). It does support the findings in the HBHS study where MI had no additive effect to physical activity, but that the intervention overall had an effect on the groups that received a culturally specific intervention (Resnicow et al., 2005). This offers additional support for the continued use and further development of culturally relevant intervention materials. A more cost efficient method to intervention than trained practitioners, tailored materials should be considered for use with research participants.

Beyond the original research questions, exploratory analysis was conducted to determine if there was any interaction between baseline motivation and change in physical activity. The results found no interaction with autonomous or controlled motivation, but did find an interaction between baseline amotivation and change in physical activity. Participants with high amotivation at baseline declined the most in their physical activity. Simply, their lack of interest resulted in a lack or decrease in physical activity. For the participants in treatment group 2 (self-help), low levels of baseline

amotivation changed the most, and lastly, participants in treatment group 3 (MI), who had high levels of amotivation at baseline, reported the most change. The effect of the MI treatment increased as the level of baseline amotivation increased. However, for both the self help and control groups the greatest effect was for those who had low amotivational scores to begin with. The ordering made sense across the three treatment groups. For example, with self help, to be successful, one would need to have a certain degree of motivation to begin with for it to be most beneficial. Due to this, it is logical to find that those with high amotivation would benefit the least from this approach. According to the findings, MI shows most beneficial for those who express high amotivation at the outset. This finding supports the idea that MI works best with resistant or ambivalent clients, demonstrated by those with the least motivation at baseline having the most change in their physical activity.

A broader look at the results in Table 4 produced another curious finding. The numbers show that there is a positive, significant relationship between change in amotivation, and change in both all activities and exercise activities. Essentially the findings show that as interest decreased (increased amotivation) physical activity increased. This analysis was not part of the original research design, but the interesting nature of the finding made it worthy of report. One possible explanation is a cognitive disconnect between participants reported level of interest and their actual behaviors. Being part of a church that is participating in a behavior change study creates some peer pressure to perform and it is possible that one might be active with others without a change motivation. Some may feel pressured to participate while their interest in doing so

diminishes. It is difficult to interpret why this happened without more information and it suggests the need for further exploration.

With the lack of change in motivation variables, it has become clear that there may be a need to reformulate the current understanding of the relationship between intrinsic motivation and physical activity amongst the participants in the current study. It is possible that one place to begin is the make-up of the study sample. Participants in our study were overwhelmingly female (76.6%) and on average 46.4 years old. The majority of the participants were either married or lived with their partner (53%) and educated; having completed all (46%) or some (70%) college. Among those that reported their income level, slightly over 60% reported an annual income of $40,000. The participants in our study fit a fairly typical profile of a working – middle class, religious African American family.

Though not conclusive, some inferences can be drawn about these participants and their families which can further delineate the relationship between motivation and physical activity changes. The participants in the study are the educated working African American middle class. Now with families of their own, these are the children of parents who may or may not have gone to college and are possibly struggling with current health ailments usually experienced by African Americans (Chatters, 1991). Thus, the participants are likely to have a family history of high blood pressure, cancer, and/or diabetes. Further, these adults are more than likely battling the dietary and physical challenges faced by their parents. It follows then that involvement in a health related program (i.e., like the Healthy Body Healthy Spirit trial) may hold particular relevance for the participants despite their lack of time and expendable resources to dedicate toward

physical activity changes in their life styles. The difference between these adults and their parents however, may be their education and ability to access and interpret health information. However, armed with information, these adults failed to enact the many health lessons related to increasing physical activity (Chatters, 1991).

Health promotion researchers and health psychologists have began to explore the barriers to increasing physical activity amongst ethnic minorities, persons low to medium SES and women. Among them are a lack of time, transportation, safe neighborhood spaces and economic resources (Chatterjee, Blakely, & Barton, 2005; Van Duyn et al., 2008). These factors are typical and were often echoed by the participants of the current study during the MI phone counseling sessions; the treatment condition. As a more nuanced understanding of barriers is explored, studies begin to address aspects of physical activity that may be particularly disagreeable. For example, D'Alonso & Fischetti (2008) found that the women in their study had culturally value-laden views of physical activity that interfered with their participation. They reported that Latina participants found exercise to be "unfeminine" and believed it interfered with their family obligations. Alternatively, African American women expressed conflict with their desire to be physically active and the pressures they felt to uphold white standards of beauty. These factors are particularly informative about what may have occurred in the current study as the sample was primarily African American female and many of the participants were likely to have home and family obligations that compete for their time. Finally, educational level, increased age, and lack of family support for physical activity efforts were found to be barriers impacting the lives of people of color, low SES persons and women (Dunn, 2008; He & Baker, 2005; James, Hudson, & Campbell, 2003).

Though perhaps more important to developing a comprehensive culturally relevant understanding of motivation as it relates to increasing physical activity behavior might be to explore the factors which promote physical activity. Here, especially for women, family becomes very important. African American women have indicated the need for family support of their physical activity endeavors (Dunn, 2008). Both African American men and women have also highlighted their need for general social support around their health behavior change and access to adequate facilities where they can partake in physical activity (Kirchhoff et al., 2008; Van Duyn et al., 2008). Additionally African Americans have identified the desire to be a role model and setting goals as effective in keeping them engaged in physical activity. Thus as health promotion is further developed with the notion of decreasing health disparities among minority populations, the theories which seek to describe motivation need to incorporate the culturally relevant aspects of the persons for which they seek to describe.

In a parallel study exploring changes in nutrition, Resnicow et al. (2001) did find significant change in fruit and vegetable intake in the population. As we begin to deconstruct what may have happened amongst the same sample in which physical activity health behaviors did not increase in the same proportions as fruit and vegetable intake, a deeper understanding of the dynamics that surround physical activity in this population may be approximated. Beyond structural and relational barriers, physical activity can be deemed unpleasant for some. Martin et al. (2008) found that African Americans described exercise as “boring” and “hard work.” Thus, it is quite possible that among the same sample of participants we see that nutritional changes may have been easier to make compared to increasing physical activity. Eating is a part of all of our

lives. Hence, making a different food choice, while inconvenient, may not prove as uncomfortable as the activities in preparation for (e.g., changing clothes, feeling embarrassed, sweating) and enacting (e.g., physical pain and being "bored") physical activity. These can present significant barriers for persons unaccustomed to being physically active. For this reason, it will be important to explore participant views of and their motivations for making some health behavior changes over others.

Implications

Provided the importance of diminishing health disparities among ethnic minorities and persons of lower SES, this study has implications for developing the research and practice in the health promotion and psychology areas. As the Self-Determination Theory did not provide an understanding for what motivates physical activity change amongst our participants, it may be that a different theoretical frame may better explain and/or illuminate the motivators of physical activity changes among African American participants. As it relates to theory, it may also be important to develop more nuanced theory to explain motivation as it relates to the physical activity in general and amongst persons of color in particular. It seems from the present study that these tools may not be precise enough to fully access the information that is needed to explain what motivates African Americans, for example, to become physically active.

It is well known that physical activity is an effective and powerful pathway to wellness and so it is critical that our frameworks are able to fully describe these dynamics. Further developing an understanding of the intersections between race, class, and social support in ways that incorporate gendered perspectives will expand our current

understanding. Additionally, investigating the factors that make physical activity unattractive to people overall, to explore possible added barriers that intersect with other demographic variables, and develop strategies to minimize the impact of these on the health behavior change are important to consider as well. Finally though the present study sought to improve the physical health of African Americans, it is important to remain mindful that interventions also guard against disordered exercise and dietary practices which harm many Americans. As health workers begin to conceptualize the types of interventions that might best work with the clients they serve, it is clear that further expansion of this work has important research and practice implications which can not only improve client health, but quality of life.

Limitations

Though able to provide the impetus for developing areas for further study, the current study has some limitations which may have compromised its utility. As indicated earlier, the sample was about 76% female and the average age of the participant was in the mid-forties. Though this provides a view of a portion of the population not often researched, the current study sought to describe more fully the motivational and physical activity dynamics among an African American church population and thus falls short in that there is not equal representation of men and women in the study. Thus the findings or lack thereof may be an artifact of this imbalance. It is possible, for example, that socially and culturally, men are permitted more leeway to be physically active. Consequently more representation may have had a different effect on the observed outcomes.

For the current study, baseline and follow-up questionnaire data were used to make comparisons of motivation and physical activity. Thus only those respondents that replied at follow-up were included. The respondents that failed to complete the follow-up differed with respect to age, income and education, such that older, more educated persons that made more money were more likely to respond. These may also be the persons more motivated to respond, because they may have 1) access to health care, 2) health information, and/or 3) current health related concerns. Additionally, with age comes decrease in physical activity (James, Hudson, & Campbell, 2003). Thus it is possible that the tendency for older persons to submit their questionnaires may have biased the data set toward persons naturally decreasing their physical activity and consequently less likely to demonstrate significant changes in their physical activity levels. Future research will seek to have more representation of younger person and persons more evenly spread across educational and economic levels.

Finally, a primary area of development needed in the area of health promotion and motivation is more nuanced theorization which more closely approximates accurate descriptions of the realities of ethnic minorities, lower SES persons and women. Provided the potential influence of various social and cultural contexts on motivation, it is imperative that the theories that seek to describe motivation of all people incorporate an awareness how motivation is shaped by these contexts.

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