USING SELF-DETERMINATION THEORY TO UNDERSTAND AFRICAN-AMERICAN WOMEN'S PHYSICAL ACTIVITY PATTERNS

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ABSTRACT

Physical inactivity is a major health risk factor in our society. Women and minority populations are especially at risk with regard to physical inactivity. This three-part study employed quantitative and qualitative methodologies to investigate physical activity behaviors in middle aged and older African American women. This population was chosen because African American women are the least active segment of our society. In the first phase, a quantitative approach was used to investigate relationships between Self-Determination and the Stage of Change for physical activity in a sample of 105 African American women. This study provided validation for using this theoretical approach in a population of African American women and provided a clearer understanding of the types of motivation most likely to contribute to the initiation and maintenance of exercise in this population. Guided by the underlying assumption that the reasons African American women choose to be active or inactive can only be fully understood by carefully examining their perspectives, a qualitative approach was used in the second and third phases of the study. Fifteen physically active and fifteen physically inactive women were purposively selected from the initial sample for in depth interviews in phase two. Categorical and contextual analysis indicated that perceptions of health status were a powerful influence on physical activity behavior. Perceptions of health status reflected the beliefs individuals held about a particular disease or physical condition, and the limitations they associated with that condition. In the third phase, six participants were selected for a multiple case study design. Cases analysis revealed that women shaped their physical activity patterns around their understanding of how physical activity would directly influence their desire to maintain independence from health costs, physical limitations related to their health, expected age related decline and their dependence on others. Across each phase of this project, identifying an individual's

level of motivation, as well as exploring the influences of that individual's social context in a particular stage of change, has contributed to our understanding of factors to consider when developing effective behavior change interventions in this population.

CHAPTER1: INTRODUCTION

The 1996 Surgeon General's Report identified physical inactivity as a major health risk factor in our society [U.S. Department of Health and Human Services (USDHHS), 1996b]. Physical inactivity manifests itself in numerous health problems, contributing to deaths from heart disease, stroke, and diabetes. In addition, it often compounds the severity of other chronic conditions. Evidence cited in the report indicates that women are generally less active than men.

The percentage of adult women who are obese and leading sedentary lives has increased over past decades, and the lack of physical inactivity associated with these conditions negatively influences their health (USDHHS, 1996a). Although a decline in the overall mortality rate due to cardiovascular disease (CVD) is evident in the United States, the rate of decline is slower for women as compared to men. The rate of decline is slowest for minority women (American Heart Association, 1997). We know that women are less active than men (USDHHS, 1996b), but there is little specific information concerning women's choices regarding physical activity. Further investigation of women's decisions about engaging in physical activity is critical to the understanding and development of appropriate interventions to address these health issues that are specific to women and physical activity (Ainsworth, 2000).

Health status and physical activity levels of women vary according to factors such as race, socioeconomic status, health behavior, and psychosocial stress (Dishman, Sallis & Orenstein, 1985; Eyler et al., 1997; USDHHS, 1996b). National surveys consistently report, however, that the African American population in the U. S. tends to exercise less than European Americans. Furthermore, when comparing exercise rates by race and gender nationally, African American women are reported to be the least active segment of the population [Centers for

Disease Control (CDC), 1995; 2000]. Taylor (1998) calls for researchers to look beyond the realities of white middle-class men and women when interpreting and investigating the health related outcomes of African American women's behaviors and their related experiences. Given the lack of research specifically focusing on African American women, further exploration of minority women may provide an understanding of cultural influences on physical activity behavior (Ford et al., 1991; Vandervoort et al., 2000). Several researchers have begun to employ qualitative methodologies in their research to increase our understandings of the meanings women give to physical activity. For example, Solmon, Munro, Autrey and Landry (2002) found that individual negotiation of barriers and facilitators of physical activity varied, depending on women's personal views of their world. Henderson and Ainsworth (2000) used a qualitative approach to explore enablers and constraints toward walking for older African American and American Indian women. They concluded that behavioral choices are influenced by a combination of personal, cultural and environmental factors. These initial efforts to understand women's unique perspectives about physical activity demonstrate the potential contribution of systematic qualitative inquiry. These approaches can be used to provide a theoretical basis for designing effective interventions for specific populations, but more theory driven research is needed that focuses specifically on minority women. Two complimentary theoretical approaches provide a sound basis for the investigation of physical activity behaviors: Self-determination Theory (SDT) and the Stages of Change Model.

While the SCM model recognizes the necessity of tailoring interventions to individual needs based on the stage of readiness, SDT theory provides a pattern from which to tailor the interventions based on internalizing motivation via the nutriments. Mullan and Markland (1997)

investigated the relationship between SDT and SCM with regard to exercise and found that individuals in latter stages of change were more self-determined than those in the earlier stages. In a similar study, Ingledew, Markland and Medley (1998) investigated SCM and exercise motives based on the SDT. While extrinsic motives dominated the earlier stages of change, intrinsic motives, such as enjoyment, were needed to attain the maintenance stage. This suggests SCM may be used as a supplemental model to SDT to enhance our understanding of motivational issues required for movement from stage to stage.

Further study is needed to validate these findings in more diverse populations, yet the contribution of these two combined theories seems evident. Identifying an individual's level of motivation, as well as exploring the influences of that individual's social context in a particular stage of change, will enhance the effectiveness of behavior change interventions in specific populations. Research combining these theoretical frameworks, inclusive of the SDT nutriments with a focus on relatedness, and the path in which these frames guide the physical activity behavior choices of women, has the potential to make a contribution to the literature.

This three part study incorporated both quantitative and qualitative methodologies to investigate physical activity behaviors in African American women. This population was chosen because African American women are the least active segment of our society, and although there is a need for effective interventions to increase their activity levels, there is a dearth of information regarding why they do or do not chose to be physically active. In the first phase of this project, the quantitative relationships between self-determination in physical activity and the stage of change for physical activity among a sample of 105 African American women were explored. The second and third phases of the study consisted of qualitative interviews and a

multiple case study design, guided by the underlying assumption that the reasons African American women choose to be active or inactive can only be fully understood by carefully examining their perspectives. Fifteen physically active and fifteen physically inactive women were purposively selected from the initial sample for in depth interviews examining their beliefs about physical activity and their rationales for the decisions they make. Based on a convenience sample also from the initial sample, six participants were selected for the multiple case study design to carefully examine the life experiences of six African American women and how they influence their behavior choices regarding physical activity.

CHAPTER 2: QUANTITATIVE INVESTIGATION

The health benefits associated with physical activity are well documented, but women continue to be less active than men, with older women and minority women being the least active segments of our society [US Department of Health and Human Services (USDHHS), 1996b]. Research about health benefits of physical activity and predictors and determinants of exercise patterns has focused almost exclusively on white males (Cardinal, 1995; Eyler et al., 1997; USDHHS, 1996a). More research is needed to better understand women's experiences related to physical activity participation (Ainsworth, 2000).

Minority women are the least active segments of our society, but the influence of socioeconomic status (SES) and race on women's physical activity pattern remains unclear (USDHHS, 1996b; Felton , Parsons, Misener, & Oldaker, 1997; Ford, Ahluwalia, & Galuska, 2000; Vandervoort, Divers, & Acojido, 2000). For example, in the 1996 and 1998 leisure time physical activity (LTPA) data from the Behavioral Risk Factor Surveillance System (BRFSS) for the state of Michigan, educational level and SES predicted participation in walking, but race was not a factor. It was suggested, however, that race should still be considered as a "marker" for other risk factors related to LTPA (Centers for Disease Control [CDC], 1995). Ford et al., (1991), sampling both upper and lower socioeconomic status (SES) levels, found that race fell closely within the SES divisions. That is, European Americans were disproportionately represented in the upper SES level, while African Americans dominated the lower SES level, for both males and females. Lower SES women, most of whom were African American, were the least active group.

Although the incidence of cardiovascular disease (CVD) has declined in recent years, the rate of decline for women is slower than that for men (American Heart Association,1999). When examining the female population, the rate of decline for African American women is slower than

that for European American women. Low levels of physical activity are associated with the less pronounced decline in CVD, as the disease process has been shown to be influenced by physical activity. Investigation of populations of minority women is needed to provide an understanding of the cultural influences on physical activity (Ford et al., 1991; Vandervoort et al., 2000).

It is important to gain a clearer understanding of what is necessary for women to overcome perceived barriers and how to facilitate their adoption of physical activity as a part of their identity or lifestyle. Dishman, Sallis and Orenstein (1985) found self-motivation to be an important predictor of physical activity program adherence. Self-determination theory (SDT), conceptualized by Deci and Ryan (1985), seeks to explain what type of motivation is most likely to initiate and maintain a behavior change.

SDT is a theory of internalization and behavioral regulation (Deci & Ryan, 1985). Internalization is the process by which motivation for a behavior moves from more external regulation to more internal regulation (Deci, Eghrari, Patrick, & Leone, 1994). The view of motivation as a continuum from amotivation (lack of motivation) to extrinsic motivation (externally controlled motivation) to intrinsic motivation (for the activity itself) is an important construct that underlies SDT (Biddle, 1999).

SDT asserts that the process of integration can explain behavior regulation and motivation. The level of volition should reflect the level of internalization or integration per the behavior. When an action is fully internalized, the person identifies with the value of the action and accepts ownership for it. The action is then considered self-determined or under self-control (Deci et al., 1994).

The continuum of self-determination or internalization guides motivation and behavior regulation from amotivation to intrinsic motivation (Biddle, 1999). Amotivation is a term used to

describe little or no motivation to attempt a behavior. There are four levels of extrinsic motivation within the continuum. Each level of extrinsic motivation reflects a different degree of internalization as the continuum moves toward intrinsic motivation. The lowest level of external motivation is referred to as external regulation. At this level, an activity such as exercise is undertaken largely because of coercion from significant others. For example, if a woman exercises to avoid disapproval from her doctor, or family members, the motivation is externally regulated. This level of regulation is associated with being controlled by rewards or threats.

Introjected regulation is the next level of external motivation moving toward self-determination. Introjected regulation is characterized by the statements: "I feel guilty if I don't go to aerobics class regularly" or "If I don't show up my workout partner will be irritated that I canceled." When a person is acting from an introjected internalization, the person values the action but does not accept ownership. Guilt or shame internally control an action that is introjectedly internalized (Biddle, 1999).

Identified regulation is represented by the statements: "I exercise to look better" and "I exercise to feel good so I can keep up with my children." This level of external regulation is approaching self-determined motivation, and is sometimes referred to as the threshold of autonomy (Biddle, 1999). The action is motivated by the outcome of participation in an activity, such as disease prevention or improving fitness. An important point with regard to the continuum is that extrinsically motivated behaviors may have varying degrees of self-determination, providing the basis of the continuum (Rigby, Deci., Patrick, & Ryan, 1992).

Integrated regulation is the most self-determined form of external motivation. Integrated regulation is reflected in the statement: "I exercise because it is important to me and it is a part of who I am." The behavior becomes fully integrated into one's identity, and is important in relation

to personal goals (Biddle, 1999). Integration is predicted to occur within a social context which supports autonomy where as introjection is more likely to occur in non-autonomous supportive environments (Deci et al., 1994). Integrated regulation is not, however, intrinsic motivation because it is not engagement for the pure enjoyment of the activity.

The highest level on the continuum of behavioral regulation is intrinsic motivation, when the individual participates in the action for enjoyment and for the action as an end in itself (Ryan, Fredrick, Lepes, Rubio, & Sheldon, 1997). As individuals move closer to intrinsic motivation, they possess stronger feelings of personal investment, autonomy, and self-identity. Intrinsic motivation occurs when the activity is valued as an end in itself and is operationalized in three forms: (a) to know, (b) to accomplish, and (c) to experience stimulation (Biddle, 1999).

Several researchers have used SDT as a framework to study exercise behavior. Fredrick and Ryan (1993) found motivational factors influence a person's participation in fitness activities. The application of SDT has produced a better understanding of how a participants' initial level of motivation upon entering physical activity program, predicts program adherence. Women who had autonomous orientations and perceived autonomous support were more likely to adhere to a weight loss program, and also more likely to maintain weight loss over time (Williams, Grow, Freedman, Ryan, & Deci, 1996). Identifying the source [ie. internal vs. external] of motivation is an important issue in regulating behavior change (Williams et al., 1996). Markland (1999) found that levels of high self-determination moderated perceptions of competence, which in turn increased internal motivation in an exercise setting for women.

Exercise participants who entered a program with high levels of intrinsic motivation and sought social interaction (relatedness) had superior exercise program attendance as compared to participants with lower levels of intrinsic motivation (Oman & McAuley, 1993). Similarly,

investigation of initial motivation for participation in physical activity indicated physical activity program attendance and adherence was related to more intrinsic motives of competence and enjoyment than to extrinsic motives such as body-related reasons for participation (Ryan et al.,1997). Activity type, either sport or fitness related, has also been found to differ as a function of the level of intrinsic motivation and ultimately in participation. Fredrick and Ryan (1993) reported that persons engaged in sport related activities were more intrinsically motivated and had greater perceived competence than individuals engaged in fitness activities, whose focus was less on enjoyment and more on body-related concerns. Even among individuals participating in physical activity, extrinsic and intrinsic motivation can be differentiated.

Another theoretical model developed to address behavior change and or adoption of a health behavior is the Transtheoretical model (Prochaska, Redding, Harlow, Rossi, & Velicer, 1994). This model is often referred to as the "Stages of Change Model" (SCM). The SCM evaluates an individual's readiness to change a behavior (Glanz et al., 1994). SCM has been an effective tool in the development of interventions which are population specific and are based on the measurement of the readiness to change of the population (Velicer, Prochaska, Fava, Norman, & Redding, 1998).

SCM acknowledges that behavioral change requires time and motivation for the activation of processes of change that enable individuals to move through stages of change. The stages reflect levels of motivational readiness or intentions to change or modify a behavior and consist of a continuum from not intending to change to the maintenance of a behavior.

The stages are Precontemplation, Contemplation, Preparation, Action, and Maintenance. In Precontemplation, the individual is not thinking of a behavior change. The Contemplation stage represents an individual who is thinking about change but has not yet made up his or her mind to

do so. In the Preparation stage, the individual has decided to make a behavior change, and is attempting to make the change yet has not been consistently participating in the new behavior. The individuals in the Action stage are engaged in the new behavior, but have not been actively engaged for at least six months. Individuals who have integrated the new behavior into their lives by consistently participating in the new behavior over six months are considered to be in the Maintenance stage. The catalysts for movement from one stage to the next are the processes of change. Ten processes of change have been identified as activities in which people engage that enable them to move from one stage to another stage (Velicer et al., 1998).

In the context of exercise behavior, Marcus and Simkin (1993) found the SCM to be useful in differentiating the levels of physical activity behaviors. Cardinal (1995) investigated exercise behavior in female adults and also found the stages of change to be differentiated. Two scales to measure exercise stages of change have been developed, each validated through self-report comparison (Cardinal, 1995; Dannecker, Hausenblas, Connaughton, Lovins, & Loving, 2000; Marcus & Simkin, 1993).

Biddle and Nigg (2000) recently reviewed several theories of exercise behavior and reiterated the need to conduct exercise behavior research from a theoretical base. SDT and SCM are both recognized by Biddle and Nigg as promising frameworks from which to further investigate exercise behavior. Mullan and Markland (1997) found that the level of self-determination was higher for individuals in the upper stages of change as compared to those in the lower stages. Thus the process of behavior regulation from initiation or the Precontemplation stage to the Maintenance stage as a process seems to be mediated by one's level of internalization of self-determined motivation. In their call for additional research concerning women and physical activity, Landry and Solmon (2002) point out the advantages of exploring women's exercise behavior by utilizing

SDT and SCM in combination to better understand women's levels of autonomy within each stage of change.

This investigation is the initial phase of a larger study that uses SDT as a framework to investigate the middle-aged and older African American women and the choices they make with regard to their physical activity patterns. This target population was selected because, according to national surveys (USDHHS, 1996a) they are at a disproportionate risk to be physically inactive because of both their race and their ages. The purpose of this study was to investigate self-determination in the regulation of exercise behavior across the stages of change for exercise in this population. Two research questions were addressed: (a) Do levels of external, introjected, identified, and intrinsic motivation differentiate exercise stages of change? and (b) Do levels of self-determination differ as a function of exercise stage of change? In this initial phase, I am replicating the work of Mullan and Markland (1997) in a sample of middle-aged and older African American women to assess the applicability of these frameworks with this segment of the population.

Method

Participants

The participants were 105 African American females ages 45-70 (M age = 55.81, SD = 7.05). Participants were patients at a public hospital, serving an indigent population of approximately 30,000 outpatients a year. Over 75% of the patient population is African American, and only 1% are commercially insured. Participants were recruited during their regularly scheduled clinic appointments at one of three clinics. Criterion sampling (Patton, 1990) was used to select participants. Criteria used included race, age and consent. After informed consent was obtained, demographic data including age, marital status, number of children, height and weight were collected.

Instruments

The Stages of Exercise Scale (SOES). Stage of exercise scale (Cardinal, 1995) is based on the Transtheoretical Model of behavior change (Prochaska et al., 1994) and construct validity has been supported with female subjects. The SOES resembles a ladder with each rung representing a different stage: precontemplation, contemplation, preparation, action and maintenance. The stages are determined by the respondent's choice of a statement that best describes her current degree of interest in physical activity and actual physical activity involvement. Due to the varying level of literacy of these participants, this instrument was given orally in an interview setting.

Behavior Regulation Exercise Questionnaire (BREQ). Mulland, Markland, and Ingledew (1997) developed the 15-item BREQ to measure four constructs from SDT: external regulation (EXT: I exercise because other people say I should), introjected regulation (IJ: I feel guilty when I don't exercise), identified regulation (ID: I value the benefits of exercise), and intrinsic motivation (IM: I exercise because it is fun). The response scale for the BREQ is a five- point likert-like scale ranging from zero to four. A zero corresponds to "not true for me," while a four indicates that statement is "very true for me." The questionnaire was given orally following the SOES.

The BREQ (Mulland, Markland, & Ingledew, 1997) was scored by compiling separate subscale scores (external, introjected, identified and intrinsic motivation). Then the Relative Autonomy Index (RAI, Ryan & Connell, 1989) was calculated to derive an overall self-determined regulation score using this formula: (-2) (EXT) + IJ + ID + 2(IM).

Data Analysis

A discriminant function analysis was used to determine if scores on the four subscales of the BREQ discriminate between the stages of change. Analysis of variance (ANOVA) was used to test for differences between groups formed based on the stages of change and RAI scores.

Results

Descriptive data for participants on the subscales of the RAI are presented in Table 1. Cronbach Alpha coefficients for each sub scale are also reported. Of the 105 participants, only two women were classified in precontemplation state, and only seven in the action stage. The statistical analyses used for this study are adversely affected by disproportionate group sizes. For that reason, stages were collapsed to construct three groups rather than five. The two individuals classified in precontemplation were grouped with the contemplation stage. The seven individuals in the action stage were combined with the 20 individuals in the maintenance stage to produce a group of individuals who are currently engaged in physical activity, labeled exercisers for this study. Means and standard deviations for the three groups used for the analysis are presented in Table 2.

The discriminant function analysis indicated that the subscales of the BREQ accounted for a significant portion of the variance in the stages of change. One discriminant function was significant (canonical r = .40, Wilks' lambda = .777, $F = 3.32$ (8, 198), $p < .001$), accounting for 71.8% of the variance in the model. The structure coefficients and group centroids are presented in Table 3. Variables with structure coefficients exceeding .3 are considered to be significant (Pedhazur, 1982). Positive values at the group centroids indicate the group has positive scores on the linear combination of the dependent variables, while negative scores indicate the reverse.

The structure coefficients indicate that introjected regulation made a significant negative contribution to the discriminant function, while identified and intrinsic motivation made significant positive contributions. The centroid values indicate that the contemplation group was negative on the function, the preparation group was relatively neutral, while the exercisers were positive on the discriminant function.

Table 1

Means and standard deviations (in parentheses) of BREQ subscales by stage

Stage	EXT	IJ	ID	IM	RAI
Precomtemplation (n=2)	0.50 (0.70)	0.50 (0.70)	0.87 (1.23)	0.87 (1.23)	5.00 (18.38)
Contemplation (n=26)	0.94 (1.05)	1.93 (1.50)	3.06 (0.76)	2.42 (1.49)	18.28 (14.65)
Preparation (n=50)	0.53 (0.79)	1.60 (1.32)	2.94 (0.79)	2.91 (0.91)	25.9 (10.64)
Action (n=7)	0.42 (1.13)	2.04 (1.55)	3.60 (0.45)	3.32 (0.73)	31.42 (14.81)
Maintenance (n=20)	0.62 (1.09)	1.88 (1.42)	3.55 (0.44)	3.27 (0.44)	29.75 (12.48)
Total (N=105)	0.64 (0.95)	1.75 (1.40)	3.09 (0.81)	2.85 (1.12)	24.74 (13.26)
Cronbach's Alpha	.74	.73	.70	.84	

Table 2

Means and Standard Deviations (in parentheses) for groups used in analysis

Stage	EXT	IJ	ID	IM	RAI
Contemplation (n=28)	0.91 (1.03)	1.83 (1.50)	2.90 (0.96)	2.31 (1.51)	17.33 (14.95)
Preparation (n=50)	0.53 (0.79)	1.60 (1.32)	2.94 (0.79)	2.91 (0.94)	25.94 (10.64)
Exercisers (n=27)	0.57 (1.08)	1.92 (1.43)	3.56 (0.43)	3.28 (0.78)	30.18 (12.85)
Total (N=105)	0.64 (0.95)	1.75 (1.40)	3.09 (0.81)	2.85 (1.12)	24.74 (13.26)

Table 3

Discriminant Function Analysis Using Behavioral Regulation to Differentiate Stages of Change

Discriminating Variable	Structure Coefficient
External	-.12
Introjected	-.52
Identified	.80
Intrinsic	.61
Group	Centroid Value
Contemplation	-.54
Preparation	-.04
Exercisers	.65

The ANOVA to test for group differences between the stages indicated that RAI for the groups did vary [$F = 7.72$, $(2, 102)$ $p < .0008$]. Tukey's Studentized Range (HSD) Test was used as the post hoc test. The contemplation group had significantly lower RAI's than either the preparation group or the exercisers. The RAIs for the preparation group and the exercisers did not differ.

Discussion

The purpose of this study was two fold. First, to determine whether the BREQ subscale scores could discriminate between the stages of exercise change among middle aged and older African American women. Second, to determine if the RAI scores differed as function of stage of exercise change. Consistent with Mulland and Markland (1997), our findings suggest that behavior regulation becomes more self-determined as one moves across the stages of exercise change. That is to say, individuals in action or maintenance stages who are exercisers are likely to be more self-determined than individuals in precontemplation or contemplation stage, who are not yet exercising.

Measures of introjection, identified, and intrinsic motivation made significant contributions to the linear function discriminating between exercise stages of change. Extrinsic regulation, characterized by motivation related to coercion from significant others, was not a significant influence in motivational constructs differentiating exercise stages of change. Mulland and Markland (1997) also found external motivation to be a non-factor in the discriminant function. The indication here is that coercion by significant others did not seem to have any impact the activity choices of these women. Examination of the means on the extrinsic regulation scale of the BREQ provides some insight. The means for all groups in this study were less than one, indicating that the women did not indicate they exercised because other people say

that they should. This suggests that the use of threats, or the expression of disapproval from health care providers will not serve as effective motivational tools. These women did not exercise because other people thought that they should, and the threat of disapproval associated with refusing to exercise was not an influential factor.

Introjected regulation, or exercising out or guilt or to avoid shame, made a negative contribution to the linear discriminant function. For the African American women in this study, guilt or shame proved to be a significant negative influence in the discrimination between individuals who exercise and those who do not. Although a similar trend for women was evident in the study by Markland and Mullan (1997), it appears to be a more powerful factor for African American women than others. In their study, the coefficient for introjected regulation fell just short of making a significant negative contribution. For the men in that study, the contribution was also minimally significant, but positive. This suggests that urging individuals to exercise out of a sense of guilt or obligation, rather than increasing their internal motivation to engage in regular physical activity, may actually serve to decrease the likelihood that they will exercise.

Identified regulation and intrinsic motivation both made positive contributions to the discriminant function that separated individuals according to the stage of change. An individual who engages in an activity because she or he recognizes the positive outcome associated with the behavior, such as exercising to improve fitness or lose weight, functions at the level of identified regulation. Referred to by Whitehead (1993) as the "threshold of autonomy," it is at this level of motivation that individuals move from doing something because they "ought to" to engaging in a behavior because they "want to." In this study, identified regulation made the strongest contribution to the discriminant function, suggesting that it is this level of motivation that is most influential in distinguishing those who exercise from those who do not in this sample.

Intrinsic motivation, defined as participating for the sake of enjoyment, or in the activity as an end of itself, also made a positive contribution to the function, but the influence of identified regulation was relatively stronger. For the older African American women in this study, exercising because they wanted to achieve an outcome (identified regulation) was a more important factor in separating those who exercise regularly from those who do not, than participating in physical activity out of enjoyment. In the Mullan and Markland (1997) study, the contributions of identified regulation and intrinsic motivation were relatively equal for the women, but the mean age of their sample was 36 years of age. Ethnicity was not reported in their study. When comparing these results with theirs, it appears that enjoyment may be more influential for younger women, while engaging in physical activity to produce an outcome (such as slowing a disease process) may have more salience for aging women.

Consistent with the Mulland and Markland (1997) study, levels of self-regulation, as reflected by RAI scores, were higher for individuals in more advanced stages of exercise. Women in the preparation, action, and maintenance stages were more self-determined in their motivation to exercise than those in the precontemplation and contemplation stages. That is, women who were either beginning or continuing to engage in regular physical activity were more self-motivated than those who were not. Mullan and Markland also found individuals in precontemplation and contemplation stages to be less self-determined than those in the preparation, maintenance, and action stages. In their study, however, there was also a significant difference between the preparation stage and the action and maintenance stages, and that was not the case here. The separation between the women at the preparation stage was not statistically different from those in the action and maintenance stages. Although speculative in nature, comparison the mean RAI of the preparation group in this study ($\underline{M}$ = 25.94) to the

women in the classified that stage in the Mullan and Markland study (M = 18.38), could suggest that, for the sample of older African American women, a higher level of self-determination was requisite to the initiation of a physical activity program. The means of the action and maintenance stages for the women in both studies are comparable.

Based on the results of this study, implications can be drawn with regard to developing effective interventions for African American women. These findings suggest strategies that rely on coercion from a health care practitioner are unlikely to have any effect on African American women's decisions about exercise. Threats of disapproval, or the use of guilt, may, rather than encouraging women to engage in physical activity, actually have the reverse effect. Rather than using techniques that are controlling, consistent with the theoretical predictions of SDT, these results suggest that reinforcing forms of self-motivation and a sense of autonomy are likely to be most effective in encouraging women to make the choice to be active. Women who had made the decision to exercise on a regular basis were those who had found a reason to want to exercise, rather than those who felt they had to exercise. This suggests that convincing African American women that exercise is a viable means of improving or maintaining their current status, and fostering a belief that exercise is of value to them, is a potentially powerful element of a successful intervention.

Conclusion

SCM has been found to be useful in differentiating the levels of physical activity behaviors in adults and specifically in adult women (Marcus & Simkin, 1993; Cardinal,1995). The strength of the SCM allows practitioners to match appropriate intervention strategies to the individual's stage of readiness (Finckenor & Byrd-Bredbenner, 2000; Orleans, 2000). Mulland and Markland (1997) provide evidence of the potential contribution of self-determination within

the stages of exercise change theoretical framework to investigate exercise behaviors and this study provides evidence that this framework has applicability in the investigation of African American women. Furthermore, the results of this study support the use of self-determination as a viable framework for the investigation of African American women's physical activity choices.

Although more research is needed in this population, this study supports the notion that rewards and threats are not significant motivational influences for exercise related behavior change. Furthermore, according to these results, approaches that employ strategies focusing on a sense of guilt or obligation, rather that fostering self-motivation may, in actuality, have a negative effect. Strategies reinforcing higher levels of self-regulation are more likely to foster long term behavior change. Although it is important to validate this theoretical approach in a population of middle aged and older African American women, this study is only an initial step in gaining a clearer understanding of the types of motivation most likely to contribute to the initiation and maintenance of an exercise behavior change in middle aged and older African American women. It is important for further studies to incorporate qualitative approaches to investigate the perceptions of this population and their previous lived experiences which may contribute to their exercise self-regulation.

CHAPTER 3: QUALITATIVE INVESTIGATION

The Surgeon General's Report identified physical inactivity as a major health risk factor in our society (U.S. Department of Health and Human Services [USDHHS], 1996a). Health benefits associated with physical activity are related to reducing preventable risk factors associated with Cardiovascular Disease (CVD). These risk factors include obesity, high blood pressure, high cholesterol and the development of Type II Diabetes. The protective aspects of physical activity tend to influence all-cause mortality in both men and women (Blair et al., 1989, 1996). Although the overall mortality rate due to CVD in the U.S. has declined over the past decades, the rate of decline is less for women than men. The rate of decline in CVD to minority women is also less than for European American women (American Heart Association, 1997).

Physical activity is particularly beneficial to older women, improving mental health status while decreasing the risk of osteoporosis and certain types of cancer (Eyler, et al., 1997; Kushi, et al., 1997). Despite these benefits, older women and minority women are the least active segments of our society (USDHHS, 1996b). Eyler et al. (1997) suggest that women who are middle-aged or older were discouraged from vigorous physical activity in their youth and thus have had little experience with physical activity. As women age, they tend not only to change their types of physical activity, but also their incentives for participation in physical activity (Centers for Disease Control [CDC], 1995; Gill & Overdorf, 1994). More research is needed to investigate women's age-related physical activity patterns (Ainsworth, 2000).

Eyler et al. (1997) proposed sociodemographic variables such as race, lesser education, and low socioeconomic status (SES) as markers for inactivity. In light of the mixed findings of studies concerning the relationship between SES, race and physical activity, however, further investigation of the influence of sociocultural factors on health behaviors is needed, especially

among minority women by race and SES (Felton, Parsons, Misener, & Oldaker, 1997; Ford, Ahluwalia, & Galuska, 2000; Vandervoort, Divers, & Acojido, 2000).

Researchers who have studied facilitators and barriers have relied primarily on data bases generated by demographic surveys of large samples. This approach has generated a list of correlates that are associated with activity levels. However, participants' perspectives and the meanings they have attached to engaging in physical activity have not been examined (CDC, 1995; Johnson, et al., 1990). Qualitative studies are needed in order to gain insight into the choices that women make about engaging in physical activity. In one such study Henderson and Ainsworth (2000) explored enablers and constraints to walking for older African American and American Indian women. They concluded that the enabling dimensions and constraints to physical activity must be viewed from a social ecological perspective, acknowledging that behavioral choices are influenced by a combination of personal, cultural and environmental factors. They call for additional qualitative research to investigate how and why physical activity is pursued by women.

Self-Determination Theory (SDT) is a theory of motivation which asserts that individuals have basic psychological needs that must be met to achieve health and well-being (Deci & Ryan, 1985). Autonomy, competence, and relatedness are identified as basic nutriments essential in meeting those needs. According to SDT, when individuals have a sense of autonomy, competence, and relatedness, their motivation will more likely be internalized or self-determined (Rose, Markland, & Parfitt, 2001). Internalization is the process by which motivation for a behavior moves from external regulation to more internal regulation (Deci, Eghrari, Patrick, & Leone, 1994).

The view of motivation as a continuum extends from amotivation or lack of motivation to extrinsic or externally controlled motivation to intrinsic motivation for the activity its self. This continuum represents an important construct underlying SDT (Biddle, 1999). A hierarchical view of motivation (Vallerand, 1997), placing intrinsic motivation as the highest and most desirable form, is consistent with current social cognitive theories that view perceptions of control as an underlying thread that links all theories of motivation (Biddle, 1999). SDT provides a lens to interpret how women give meaning to particular situations and perspectives. In turn, this provides an understanding of why women may or may not be motivated to participate in physical activity (Landry & Solmon, 2002).

In an exercise setting, levels of self-determination were shown to influence women's perceived competence, and ultimately, intrinsic motivation (Markland, 1999). The application of SDT also produced an enriched understanding of how the initial level of motivation for physical activity program participants might predict program adherence (Oman & McAuley, 1993) and whether adherence was related more to intrinsic motives of competence and enjoyment than to extrinsic motives, such as body-related reasons for participation (Ryan et al., 1997).

This investigation is part of a larger study of physical activity patterns of middle aged and older African American women. The first phase of this project, consistent with previous work, provided evidence that middle aged and older African-American women who exercise are more self-determined than those who are inactive. The purpose of this phase was to use a qualitative approach to explore the reasons middle aged and older African American women choose to participate or not to participate in physical activity and exercise. This population was specifically investigated because of the evidence that they are especially at risk to be physically

inactive, based on age and race demographics. Although SES was not explored, it was controlled in regard to the location of recruitment

Methods

Participants

Thirty women were purposively selected from 105 African American women, ages 45-70, who were participants in phase I of this project. They were recruited during regularly scheduled visits to a public hospital primary care clinic in the southwest United States. The population served by this hospital is predominantly indigent. For the survey study, criterion and convenience sampling (Patton, 1990) were employed to recruit volunteers. Criteria for the survey study were race and age. Potential participants were identified and informed of the details of the study. Participation was voluntary and consent was obtained from all participants.

Sixty-one of the 105 participants agreed to be interviewed following the completion of the surveys for the larger study. Of these, 15 participants described themselves as active, based on their responses to the stage of exercise change questionnaire, while 46 described themselves as inactive. From the pool of 46 inactive interview participants, 15 inactive participants were selected by matching them to the active participants--first by age and body mass index (BMI, Howley & Franks, 1997) and then if necessary, by marital status and number of children. This selection process yielded 15 matched pairs of active and inactive participants with similar demographic characteristics (age, BMI, marital status and number of children). Descriptive data are reported in Table 1.

Interview

The interview questions were selected based on queries designed to elicit issues specifically related to the constructs from SDT. These encompassed autonomy, competence, and relatedness

Table 1

Participant Characteristics

Participant Characteristics (N = 30)				
	Active (n = 15)		Inactive (n = 15)	
	Mean	SD	Mean	SD
Age	55.46	7.55	55.26	6.97
BMI	33.24	6.28	33.48	6.13
Marital status	Single	Married	Single	Married
Number of children	3 or less	more than 3	3 or less	more than 3
	6	9	6	9

in relation to barriers and facilitators of physical activity. The interview included questions about their perceptions of control of their health, their definitions of health and exercise, and goals for health and exercise in the past, present, and future. Participants were also asked about concerns associated with their current health status and how those concerns influenced their physical activity choices. Even though the open-ended interview questions were predetermined from underlying assumptions of SDT, ultimately the personal voices of these women allowed the meanings, experiences and understandings of mid-life and older African American women's activity patterns to emerge. In this manner, the participants identified their own personal understandings. Interviews were audio taped, and transcribed verbatim.

Procedures

On the day of their regularly scheduled clinic appointments, after agreeing to participate in the study, participants joined the primary researcher in a private room normally used for exams. They completed the instruments for the survey study, and then consented to be interviewed. The interviews ranged in length from 10 to 25 minutes. All participants were interviewed using a standardized interview protocol guide. Data collection extended over a three-month period.

Data Analysis

According to Maxwell (1997), three strategies can be utilized to analyze qualitative data. The three strategies are categorizing, contextualizing and data displays. Categorizing allows the researcher to sift the data into categories by unitizing or coding units of information to allow for comparisons of similarities or differences between and within groups of data (Lincoln & Guba, 1985). Contextualizing the data allows the researcher to view the data from a holistic view. During the contextualization process the transcripts are reviewed as individual data units allowing for themes to emerge across all data sources. By contextualizing the data the researcher

is attempting to understand the "picture" that the context and relationships of the responses to interview questions represent. General themes underlying the data emerged from the contextualization of the data. Data displays are figures, tables or illustrations which allow the reader to visualize relationships within the data. Tables were used as data displays. Effect sizes were calculated based on the frequency counts of responses by categories. The effect size represents the specific counts or percentages of data units (Onwuegbuzie, & Teddlie, 2003).

The categorical analysis is reported based on the responses to four interview questions concerning control of health, the importance of exercise, and perceived barriers to and facilitators of exercise. Contextual analysis is reported by the overall theme and two underlying themes that emerged. Trustworthiness and credibility were established using member checks (Patton, 1990). A member check was completed by meeting with women from the participant group and non participants from the same demographic group to discuss preliminary and final study findings. Participants agreed to be available by phone or in person during the analysis if clarification of transcripts was needed.

Findings

Categorical Analysis

Control of health. When asked about their perceptions of control over personal health, an emphasis on health status was evident. Even though several women were unsure about the level of control they had on their health, or felt they had only partial control of their health, both active and inactive participants expressed a belief that they had some level of control of their health. The women's explanations of the factors that influenced their perceptions of control were coded into six categories. Within the descriptive categories, positive and negative counterparts were evident. Responses were coded as positive when they reflected something that the participant

viewed as contributing to their health, while they were coded as negative when the response suggested a lack of control or a negative influence. Participants' responses in this and other categorical analyses often contained references to more than one category, so the total number of responses exceeds the number of participants. The category descriptions, frequency counts, and effect sizes are presented in Table 2. Effect size is based on responses from all participants.

The most frequently mentioned factor influencing control was self-care. This category included actions that individuals can take that influence their health, such as eating right and exercising. "I eat right and exercise" was coded as positive self-care, while "I don't do the things I am supposed to do, like exercise" was coded as negative. The next most prevalent category was labeled mind-set, which included references to a mental state, thought process, or way of looking at life as means of obtaining a sense of control, such as "you just have to set your mind to it." Responses in this category reflected a belief that the willpower, or lack of it, to execute health behaviors in an influential factor in controlling your health. More than half of the unit responses (thirty of the forty-six) were coded in one of these two categories.

When participants made references to following doctors orders, taking prescribed medication and keeping doctors appointments, these were coded as medical adherence. An indication of a lack of control attributed to an unwillingness to do what the doctor says was coded as a negative statement in this category. It is of interest to note that 82% of the response units were coded into these three categories: self care, mind set, and medical adherence categories. These are active versus passive decisions to perceive control of one's health.

The remaining responses were coded as disease progression, spirituality, and knowledge. The disease progression category included responses that made reference to a lack of control

Table 2

Frequency Count of Factors Influencing the Control of Health

	Active		Inactive		Effect Sizes (percent of total in parentheses)
Category	Positive	Negative	Positive	Negative	
Self care	7		6	3	16 (34.78%)
Mind set	6	2	5	1	14 (30.44%)
Medical adherence	4		3	1	8 (17.39%)
Disease progression		1		3	4 (8.70%)
Spirituality	1		1		2 (4.35%)
Knowledge		1		1	2 (4.35%)
Total	18 (81.81%)	4 (18.18%)	15 (62.50%)	9 (37.50%)	46 (100.00%)

because of deteriorating health status. These responses indicated the participants were limited in the control they had over their health because of a medical condition they could not control, such as high blood pressure, diabetes, or an orthopedic problem. Three inactive participants and one active participant made reference in their responses to a lack of control because of a disease. Responses attributing control of one's health to a "higher power" rather than their own actions were coded as spirituality. Two participants indicated a lack of knowledge as a factor affecting the level of control they could exert over their health. Specifically, they expressed regret that if they had more knowledge about healthy life styles when they were younger, they might have acted differently and would have control of their health now.

Importance of exercise. The majority of participants, 87% of both groups, agreed that exercise was important. When asked to explain the importance of exercise, 68 units were coded. Of those, 56 were related to outcomes that are associated with exercise, and these responses recognized the association between positive health outcomes and exercise. The frequency counts by category and effect sizes for rationales for importance of exercise are presented in Table 3. Three subcategories represent the outcome category: acknowledging general benefits, experiencing specific benefits, and improved body function. Responses in the general benefits subcategory were those that identified a global benefit of exercise for the population at large, such as "It is good for your health." When participants identified a specific benefit they had experienced, then their response was coded in the sub category for experiencing specific benefits, such as "I rest better if I get some exercise." Responses were tallied in the improved function category when they made reference to a specific improvement related to function, such as "it helps your lower back."

The remainder of the responses that were coded generally reflected either a lack of clarity concerning the importance of exercise or a certain amount of skepticism. Three active and four

Table 3

Importance of Exercise

Category		Active	Inactive	Effect Sizes (percent of total responses in parentheses)
Outcomes		28 (90.32%)	28 (75.67%)	56 (82.35%)
	Acknowledging General Benefits	{11} {35.48%}	{13} {35.14%}	{24} {35.29%}
	Experiencing Specific Benefits	{7} {22.58%}	{7} {18.92%}	{14} {20.59}
	Improved Function	{10} {32.25}	{8} {21.62}	{18} {26.47%}
Unsure		3 (9.67%)	4 (10.81%)	7 (10.29%)
Conditional			3 (8.10%)	3 (4.41%)
Cautious			2 (5.40%)	2 (2.94%)
Total		31 (45.58%)	37 (54.41%)	68 (100.00%)

inactive women indicated that they were simply not sure why exercise is important, such as "I think so (that exercise is important), but I am not sure why." When women indicated that exercise was important, but included a conditional response, this was coded as conditional. For example, one woman commented, "Yes, I do believe physical activity is important to my health,(coded as general benefit) well, along with my diet (conditional). Some responses implied an attitude of caution or wariness about engaging in exercise, recognizing the potential risk of injury or harm, such as "you could hurt a muscle." Only inactive women made conditional and cautious responses

Physical activity patterns over time. When asked how their activity patterns had changed over time, overall, a majority of participants indicated they were less active than in the past. This is consistent with surveillance data and other reports that indicate physical activity decreases with age (Caspersen & Merritt, 1995). When comparing the active and inactive groups, however, marked differences are evident, as a slight majority of the active group classified themselves as either equally or more active than they had been in the past. In contrast, none of the inactive group indicated they had maintained or increased their activity levels. The distribution of participants' responses by group is presented in Table 4. To better understand participants' perceptions of their physical activity patterns, they were asked to explain their reasons for decreasing, maintaining, or increasing their levels of activity. For participants who indicated they were less active now than in the past, 36 responses were coded into six descriptive categories. Category descriptions, frequency counts, and effect sizes are presented in Table 5. Participants indicated that health status was the primary factor which influenced the decrease in their physical activity patterns. When participants indicated they exercised less because of a physical condition such as a stroke, kidney problems, or hip problem, their responses were coded in the health status category. Individuals also indicated that aging influenced their inability to

Table 4

Self-reported Comparisons of Present Activity Levels with Past Activity Levels

	Active (n=15)	Inactive (n=15)	Total (N=30)
Less Active	7 (46.66%)	13 (86.66%)	20 (66.7%)
No change	1 (6.66%)		1 (3.33%)
More Active	7 (46.66%)		7 (23.33%)
Undecided		2 (13.33%)	2 (6.67%)

Table 5

Reasons for Deceasing Physical Activity Patterns Over Time

Category	Active	Inactive	Effect Sizes (percent of total responses in parentheses)
Health status	6 (66.66%)	11 (40.74%)	17 (47.22%)
Age related	1 (11.11%)	5 (18.51%)	6 (16.66%)
Environment		5 (18.51%)	5 (13.88%)
Daily obligations	1 (11.11%)	2 (7.40%)	3 (8.33%)
No explanation	1 (11.11%)	2 (7.40%)	3 (8.33%)
“Gotten lazy”		2 (7.40%)	2 (5.55%)
Total	9 (25.00%)	27 (75.00%)	36 (100.00%)

maintain their activity levels. As one woman commented, "Well because I guess the older I get so tired when I do, so I just stopped doing them."

Other factors mentioned revolved around more external influences. The environmental category consisted of references to the weather, safety concerns and absence of a companion. When respondents' explanations included references to lack of time due to work, church, and/or family responsibilities, they were coded as daily obligations. Several individuals had no explanation for their decreases, while others acknowledged they had no real excuse, that they had just "gotten lazy."

The responses of the active women who indicated they had either increased or maintained their levels of physical activity provide important insight into what enables older African American women to make the choice to be active. The one active participant who said that she had maintained her level of physical activity indicated she did so in order to prevent disease and maintain her health. Of the seven active participants who said they had increased their levels of physical activity, six indicated that their reason for increasing their physical activity level was to improve their health status. For example, one participant responded, "Like I say, my health. It was time to do something." Another participant commented, "I do more now. Because I got tired of taking the medicine and I wanted my cholesterol down." The other active woman who had increased her activity level indicated that she became become more active because she finally had time for herself.

Perceived barriers. To gather information concerning factors the women in this study perceived to be significant barriers to the initiation and maintenance of a regular program of physical activity, they were asked "If I were magic, what could I do to get you to exercise . . . " Forty-seven responses were coded into seven descriptive categories. The frequency counts by category and effect sizes for perceived barriers are presented in Table 6. It is of interest to note

that the inactive participants produced over one-third more codeable responses, and that their responses are more varied.

Responses revealed health status to be a major barrier to exercising for both groups, as more than half of the responses were coded in the category "Fix me." Twenty-five of the 30 participants made reference to this category in their responses. They indicated that if their chronic health problems, such as orthopedic problems and diabetes could be "fixed" that they would be able to engage in a more active lifestyle. The next most prevalent category was empowerment. Comments coded in this category reflected a need for encouragement or willpower to stick with an exercise program. A few individuals indicated that if someone could help them with their daily obligations, such as household, family and job responsibilities that would enable them to maintain an active lifestyle, and that constituted the third category. The fourth category, mentioned only by inactive individuals, was environment. References to making my neighborhood safer or improving the weather were coded in this category. Three participants made reference in their responses to a belief that there was not anything that someone else could do to get them to exercise, that it was some thing that they had to do for themselves, and those statements were coded into the "mind set" category. One individual indicated that she did not know what someone else could do, and another indicated that there was nothing anyone could do, because "I can't be fixed."

Contextual Analysis

Contextual analysis was completed by reviewing the transcripts from a holistic perspective. This allowed examination of the data for a better understanding of the meanings and perceptions middle-aged and older African American women hold concerning health and physical activity. The core theme that emerged from the data in the contextual analysis revolved around the powerful influence of the participants' perceptions of the relationship between health

Table 6

Perceived Barriers

Category	Active	Inactive	Effect Sizes (percent of total responses in parentheses)
Fix me!	10 (55.55%)	15 (51.72%)	25 (53.19%)
Empowerment	2 (11.11%)	6 (20.69%)	8 (17.02%)
Daily Obligations	3 (16.66%)	2 (6.90%)	5 (10.64%)
Environment		4 (13.78%)	4 (8.51%)
"Nothing for me/It's a mind set"	2 (11.11%)	1 (3.45%)	3 (6.38%)
"I don't know"	1 (5.55%)		1 (2.12%)
"I can't be fixed"		1 (3.45%)	1 (2.12%)
Total	18 (38.30%)	29 (61.70%)	47 (100.00%)

status and physical activity. Contrasting responses of the active and inactive women revealed that the perceptions were distinctly different for the two groups, and it is the difference between the way that they perceived the relationship between health status and physical activity that was the most powerful discriminator between them. Specifically, for active women, physical activity was perceived as a means of improving, regaining, or maintaining health or physical function. It was valued as a mechanism that could improve their quality of life, or something that could enable them to combat, or at least slow down, the effects of aging and disease. For inactive women, health was seen as a limiting factor in their ability to be active. That is, they believed that they were unable to be active because of their health status or physical condition. They did not, as a group, believe that they were able to engage in a level of activity that could positively influence their health status. For them, barriers associated with their health status were insurmountable and physical activity was something that was essentially not available to them.

Two factors or sub themes emerged in the contextual analysis that help to explain the differences between the active and inactive participants in the way that they conceptualized the relationship between health status and physical activity: life experiences and life circumstances. For clarity in the explanation of these factors that follows, active participants have been assigned pseudonyms that begin with the letter "A" while pseudonyms of inactive participants begin with the letter "I."

Life experiences. Factors associated with this sub theme encompass participants' perceptions, beliefs, and understandings of their life experiences as they relate to the choices they make regarding physical activity. Life experiences provided participants with either the presence or absence of knowledge related to the benefits associated with physical activity. Active participants demonstrated a knowledge of and appreciation for potential benefits associated with of physical activity, and that motivated them to remain active. Inactive

participants had difficulty understanding, articulating and negotiating the possibilities available to them through participation in physical activity, as well as the negotiations required to overcome barriers in the initiation of a new behavior. This situation of difficulty for inactive participants negatively influenced their activity patterns.

The contrast in the life experiences and resulting knowledge systems between active and inactive groups was evident when participants were asked to explain why exercise was important. Ida responded, "well, walking is good for your heart …but I need help with more or less the tummy …." Another inactive participant, Inez replied, "It is good for you, but you know then without the pain, and then it helps your breathing … plus now I try walking one day … Oh. I got out of breath." Isabelle's response also illustrates a lack of understanding of the benefits associated with exercise: "Well, in some ways you can mess up a muscle, you know if you don't do the exercises right. But mostly it's healthy." The inactive participants were not able to clearly articulate, from a personal perspective based on their experiences, why exercise was important to them, and consequently, their responses suggest they approach exercise with a degree of caution and skepticism.

Active participants spoke about the importance of exercise with direct experiences related to the benefits of their participation in exercise. Annabelle pointed out, "If I miss walking, my blood sugar is higher the next morning." Alma said, "Yes, I rest good when I walk." Anita commented, "I feel good anytime I walk." These participants, in contrast to the inactive participants, had positive experiences with physical activity and that translated into a belief system that fostered choices to be physically active.

Active women understood and/or experienced the benefits of physical activity, so they continued to make the choice to be active despite failing health status. Conversely, inactive women seemed to lack that understanding and those experiences, and became less active because

of their failing health status. The understanding of personal health status and the benefits of physical activity was an underlying motivator to participation in physical activity for active women, while the lack of it proved to be a barrier for inactive women. For instance, when Irma was asked to explain any changes in her physical activity patterns in the past, she responded, "I would say less, because I was working before my hip got … and because I can't see how to get around." Izzy replied, "Those knees. Yeah, I couldn't do it, you know." Amanda's explanation as to why she felt so strongly about exercise illustrates a case where poor health status did not deter the attempt to be active: "Yes, I suffer with heart problems and I don't want to get – eat the wrong things that I'm not supposed to eat. And that's why I exercise some." Anita's response illustrates how poor health can be translated into a powerful motivator when exercise is viewed as a viable method of improving the condition: "When I was heavier, by 5:00 my knees would start hurting. It [would] start from my knees to my ankles, and I knew I needed to do something--and I did." Health status limitations decreased Irma's and Ingrid's physical activity and motivated Amanda's and Anita's.

The lack of support from the medical profession was evident in comments of many inactive women regarding the need for empowerment and knowledge. Several inactive women alluded to the fact that they had never been directly encouraged by medical professional to be active. When asked what might help her become more active, Ingrid requested encouragement by replying, "Hum…you would probably have to fix my mind and psych me up to want to do it." Irma responded with, "If you ask me, I'll do it. You don't have to go about doing all that stuff. I need to, I really do." This woman acknowledged the need to be active, and yet requested encouragement or direction to proceed. This may be perceived as another excuse not to exercise, however, many women from both groups emphasized the desire to be motivated and encouraged

when they received medical care. Fulfilling this request could validate the importance and connection between physical activity and health outcomes for these women.

Life circumstances. Factors associated with life circumstances are external factors that include work, environment, and family. These life circumstances interact with the participants' experiences, perceptions, and beliefs to affect their physical activity choices. External circumstances were factors for all participants at some level, based on their demographic information as reflected in the review of the transcripts. However, inactive participants articulated more difficulty negotiating barriers perceived from life circumstances, such as work, family and weather than did active participants.

Life circumstances such as housework, employment hours and neighborhood environment were concerns primarily to the inactive women. Ingrid's response illustrates how trying to stay active was difficult for her: "I got lazy. Working, I was working so, I was working twelve hours a day, I had a twelve-hour shift. That's really the reason I stopped, cause I was working long hours." When asked what could help her to become more active, Irma replied: "Well, probably help me clean up, I guess. Get the housework done, then I could get down with it." When inactive women felt that choosing physical activity was in opposition to other responsibilities, exercise was not chosen. Instead of negotiating external barriers so that they could include exercise into their lives, the inactive women viewed the addition of physical activity as an imposition and ultimately a low priority in relation to other life circumstances. Active participants such as Amy, did however, negotiate around her work schedule to remain active, as her explanation concerning her current walking schedule reveals:

> Well I would love to do it [walk] twice a day but the way I work some time I can't go in the morning cause I have to be to work for 6:00. But when I don't have to be to work for 6:00 I normally go twice a day . . . I decided I'd go in the morning and in the afternoon I'm not real tired when I get off work I go back. Or either I come home and rest and then go.

Weather was also an influential life circumstance for the inactive participants' activity patterns. When inactive participants were confronted with weather issues, their activity level tended to fall, as Isabella explains her reason for no longer being active, " . . . I was doing it in the summer and when it got cold I didn't do it. And then later I missed, you start missing you don't go back, in my case. So I just quit." Ida wasn't really sure why she wasn't walking much anymore, but weather came to mind, "I don't know whether it's the heat or what, I just don't do it." In contrast, weather was not articulated as a life circumstance barrier from active women.

Safety and companionship were a concern for several inactive participants. When Irma's children moved away, she became less active:

> Cause I used to walk a lot. I used to play a little basketball, back in the back yard cause we have a goal and stuff. I used to a long time ago when the kids were small cause they liked to play . . . I just don't know, I guess they grew up and started going their separate ways and I just got couch and TV I guess.

Several inactive women also discussed losing a safe neighborhood to exercise in. Often dealing with an unsafe neighborhood meant changing one's already inflexible schedule or finding a partner which was not always an option. Izzy's response implies an unsafe neighborhood and lack of companionship were the reasons she is no longer as active as she was:

> No, I just don't like walking by myself. Nothing to do with my neighborhood, this time when you hear things happen, I ain't going to take no chance walking early in the morning like that. You know, you never know what's going on.

The combination of an unsafe neighborhood and lack of a companion was also evident in Ingrid's explanation for her change in activity level:

> And then my neighbor went and got kind of rowdy, I used to walk in the evening time. And he got so bad, in the dope business and stuff, so I had to stop. And I had nobody to walk with me. If I do it, I get up in the morning time, but I hadn't been doing it lately.

Sometimes lack of knowledge or experience related to stress management and self-care produced gradual decreases in the physical activity patterns of the inactive women's lives. Isabelle shared her struggle to take time for herself as she was explaining her change in activity level:

> Okay, like I, like a lot of times I'll be a little stressed out, depressed, it just be a lot of things that keep me from doing things that I could still be doing but you know, your mind just won't let you. When your mind is always moving and thinking about different things that are going on in your life and you know it just hinders you, really. You know when you can't focus on … And I always was so busy, taking care of the kids, taking care of everybody else, running here, doing this for everybody, doing this and doing that. Never had time for [me]. And when you don't take the time out for yourself, then you, you know, your body just, you know you just let yourself go.

It is possible that these same circumstances were faced by the active participants, but the negotiation of life circumstances did not emerge for them as an influential factor in their decisions to engage in physical activity. This conceptualization is supported in the categorical analysis, as the inactive women were more likely to mention environmental factors in their responses.

Discussion

The strength of this investigation is the ability to contrast and compare active and inactive middle aged and older African American women. D'Elio, Ness, Matthews and Kuller (1997) suggest examination of the commonalties and differences between physically active and inactive individuals in healthy populations may provide a better understanding of how an individual's unique life experiences shape behavior. Self-determination theory (SDT) provides a framework from which to interpret the results of this study, and to understand the underlying issues concerning the choices women make in regard to their level of physical activity. Using SDT as a framework, it is clear that the autonomy and competence nutriments are influential, and there is some support for the notion that relatedness is also a factor in why the participants make

the choices that they do with regard to physical activity. In this study, the active and inactive women expressed marked variation in perceptions of autonomy and competence related to their understanding of their control of their health. The varied perceptions of autonomy and competence help to explain activity level differences, so this discussion will be organized around the nutriments of SDT.

Autonomy

According to Deci and Ryan (1985), individuals are more likely to engage in and maintain behaviors over an extended period of time when the behavior is pursued because of personal desire rather than an obligation. In addition, Dishman and Steinhardt (1990) suggest that perceived control over one's health is a key factor in understanding what is required for knowledge or intentions to be translated into motivation for action. This is crucial, considering the that some women do not believe they have control regarding their risk of disease and control over the disease process (Benrud & Reddy, 1998; Dishman & Steinhardt, 1990; Naimark et al., 1999; Wilcox & Stefanick, 1999). The core theme in this study is rooted in the divergent nature of the perceived relationship between health status and physical activity for the two groups of women. Active women perceived physical activity as a means of mediating or improving health status, while inactive women perceived health status to be an insurmountable barrier to becoming active. This is clear evidence that the active women have higher levels of autonomy concerning engaging in physical activity.

In a recent study, Solmon, Munro, Autrey, and Landry (2002) used SDT as a framework to investigate barriers to and facilitators of physical activity for mid-life women. Their analysis revealed that the same factors that constituted barriers for some women to engage in physical activity were successfully negotiated by others to become facilitators. For example, family responsibilities were cited by some women as barriers that made it difficult or impossible for

them to take the time to exercise. Others, however, were able to negotiate this barrier and reframe those responsibilities to become facilitators. Specifically, they were able to incorporate physical activity into their role of caretaker. The findings from this study provide an interesting parallel in that health status was negotiated differently between the groups. That is, active women choose to become or remain active as a means of mitigating their health status, while others believed that they were unable to be active because of their health status.

The findings of this study suggest that active women valued physical activity as a means to improve their quality of life, particularly with regard to their health status. They were exercising out of choice rather than guilt or obligation, and their decisions to be active were autonomous. These women regarded activity as a valid part of whom they are and what they do and as an important part of their lives. Conversely, the inactive women were stifled by their health status and demonstrated perceptions of low autonomy regarding their health status and physical activity.

Competence

Competence is defined as the belief that one is capable of producing a desired outcome. Markland (1999) investigated the effects of perceived competence on self-determination in an exercise setting and found that participants with high levels of self-determination were not influenced by perceived competence while participants low in self-determination and perceived competence were less likely to participate. In this study, the inactive women were less self-determined than the active women. Based on the Markland study, if they are low in perceived competence, because they are low in self-determination, they are unlikely to be able to negotiate perceived barriers to exercise, and that does seem to be the case. They did not view exercise as a viable option or choice due to their perceptions of the limitations of their health status. In this condition, even a woman who had prior experience participating in physical activity would not

be likely to be active because of a lack of self-determination coupled with a low sense of competence.

In this study, competence may be further defined as a belief in being able to exercise at all, extended to an ability to exercise to produce health benefits. It was evident in the responses of the inactive women that they lacked this sense of competence in matters relating to control of personal health. Although they acknowledged the importance of physical activity, they were unsure that physical activity could be incorporated into their lives. In contrast, active women not only seem to perceive more control over their lives, but that they also expressed higher levels of competence, or confidence in their ability to be active.

Relatedness

Relatedness is considered to be bidirectional, in that one not only seeks to give or care for, but also to receive or be cared for. The quality of relationships with others, feeling understood, participating in meaningful dialogue, and having fun with others are all components of relatedness (Ryan & Deci, 2000). A given social context may provide relationships that vary in the amount of supportiveness for the internalization of a behavior and thus facilitate the behavior becoming more internally regulated (Rigby, Deci, Patrick & Ryan, 1992). The importance of this nutriment is revealed in the findings of this study through the examination of the concerns of the inactive women. While the majority of the responses from the active women concentrated on issues of health status, inactive women were more likely to have additional concerns relating to empowerment, environmental concerns and daily obligations, and these focus on the nutriment of relatedness. Responses coded as empowerment were requests for interaction from health care providers. Environmental concerns included the need for companionship, and daily obligations were related to demands from family and work responsibilities. Responses in these categories reflect a social context which lacks support for

being physically active. This finding coincides with the other finding suggesting a lack of perceived social support from one's home environment, physician relationship, and/or program instructor has been negatively associated with health behavior change (Devin & Sanstrom, 1996; Henderson & Ainsworth, 2000; King, et al., 2000; Martin et al., 1984; Martin & Dubbert, 1982).

Implications

The findings of this study support the use of SDT as a framework to investigate middle aged and older African American women's choices about physical activity. Results of this study and other literature suggest that the element in health behavior change interventions for women emerging as the dominant factor is the degree to which the intervention is multidimensional, flexible, and thus tailored to fit the kaleidoscope of women's unique situations (Brownell, Stunkard, & Albaum, 1980; Devine & Sandstrom, 1996; Dunn et al., 1999; Gates & McDonald, 1997; Gill & Overdorf, 1994; King, et al., 2000; Martin, et al., 1984; Senekal, et al., 1999). The need for a multidimensional intervention is evident in both the categorical and contextual analysis of this study. Both approaches illustrate that women do not approach physical activity from one perspective. Rather, the unique life experiences that women have had, coupled with the life circumstances they currently face, combine to create situations that require individualized approaches if health practitioners are to design and implement effective interventions.

Two key factors emerged from this study that are relevant to effective interventions with middle-aged and older African American women:

1. Medical practitioners should provide autonomous support, specifically working to convince inactive women that increasing activity is possible for them and that it will yield benefits.

2. Knowledge about the disease process and the positive effect of physical activity should be included in treatment protocols, along with support services to insure that women understand the relationship between physical activity and health, and that the women have the knowledge, skills and resources they need to become active.

One way to approach intervention development is to help women identify barriers such as beliefs about their health status that may hinder their engagement in physical activity. Subsequently, this would allow women to develop personalized strategies to directly reframe and restructure their understanding of perceived barriers.

Generalization of the findings of this study is limited, however, the findings do provide insight into issues related to how women's experiences influence their activity patterns. Further research is needed to increase our understanding of mid life African American women's lifestyle choices and behaviors in an effort to provide effective health promotion interventions related to increasing their physical activity levels.

CHAPTER 4: CASE STUDIES

Despite the fact health benefits related to physical activity has been well documented, inactivity continues to be a national health problem. Health status and physical activity levels of women are found to vary according to factors such as race, socioeconomic status, health behavior, and psychosocial stress (Dishman, Sallis & Orenstein, 1985; Eyler et al., 1997; USDHHS, 1996b). However, African American women are reported to be the least active segment of the population when comparing exercise rates by race and gender, nationally [Centers for Disease Control (CDC), 1995; US Department of Health and Human Services (USDHHS), 1996b].

Even though African American women's inactivity rates remain high, few studies have specifically investigated this population (Eyler et al., 1998). Taylor (1998) calls for researchers to look beyond the realities of European American middle-class men and women when interpreting and investigating the health related outcomes of African American women's behaviors and their related experiences. Several researchers have begun to employ qualitative methodologies in their research to increase our understanding of the meanings women give to physical activity. For example, Solmon, Munro, Autrey and Landry (2002) found that individual negotiation of barriers and facilitators of physical activity varied, depending on women's personal views of their worlds. Henderson and Ainsworth (2000) used a qualitative approach to explore enablers and constraints toward walking for older African American and American Indian women. They concluded that behavioral choices are influenced by a combination of personal, cultural, and environmental factors. These initial efforts to understand women's unique perspectives about physical activity demonstrate the potential for contribution of systematic

qualitative inquiry. Two complimentary theoretical approaches provide a sound basis for the investigation of physical activity behaviors: Self-determination Theory (SDT) and the Transtheoretical Model.

The Transtheoretical Model is a theoretical framework developed to address health behavior change (Prochaska, Redding, Harlow, Rossi, & Velicer, 1994). This model is often referred to as the "Stages of Change Model" (SCM). The SCM evaluates an individual's readiness to change a behavior (Glanz et al., 1994). SCM has been an effective tool in the application of interventions which are population specific based on the measurement of the readiness to change (Velicer, Prochaska, Fava, Norman, & Redding, 1998). SCM acknowledges that behavioral change requires time and motivation, which in turn activate processes of change enabling individuals to move through stages of change. The stages are levels of motivational readiness or intentions to change or modify behaviors and provide a continuum from not intending to change a behavior to the maintenance of behaviors. The stages are Precontemplation, Contemplation, Preparation, Action, and Maintenance. Marcus and Simkin (1993) found the SCM to be useful in differentiating the levels of physical activity behaviors. Cardinal (1995) investigated exercise behavior in female adults and found the stages of change to be differentiated as well.

Self-Determination Theory (SDT) is a theory of motivation and behavioral regulation that focuses on internalization within a social context (Rose, Markland & Parfitt, 2001). Internalization is the process by which motivation for some behavior moves from more external regulation to more internal regulation (Deci, Eghrari, Patrick & Leone, 1994). The process of internalizing knowledge is seen as an essential element in the initiation and maintenance of long-term behavioral change, in which a sense of autonomy is a key component or nutriment.

SDT assumes individuals have basic psychological needs that are innate, universal, and essential for health and well-being (Deci & Ryan, 2000). Autonomy, competence, and relatedness are identified as nutriments that are necessary to satisfy these psychological needs. They are the fuel for an individual's endeavor to internalize or integrate one's actions and experiences into self within a social environment (Deci et al., 1994).

Though more research is needed to validate the utilization of the SCM and SDT in more diverse populations, the contributions of the combination of these two theories are evident. Identifying an individual's underlying level of motivation and further exploring their social contextual influences while in a particular stage of change can yield information that will enhance behavior change interventions.

Researchers who have studied facilitators of and barriers to physical activity have relied primarily on data bases generated by demographic surveys of large samples. This approach has generated a list of correlates that are associated with activity levels. However, participants' perspectives and the meanings they have attached to engaging in physical activity have not been examined (CDC, 1995; Johnson, et al., 1990). The purpose of this study is to extend the empirical understandings of factors that shape middle aged and older African American women's physical activity patterns through a multiple case study design. The influence of SDT constructs: autonomy, competence and relatedness, was investigated with regard to participants' stage of change. The multiple case study design was guided with the underlying assumption that the reasons African American women choose to be active or less active are not fully understood. A clearer understanding will provide valuable information for interventions designed to increase physical activity for this population.

Method

Participants

Participants for this study were six African-American women who were selected from a pool of participants who had participated in two previous studies. Participants in the initial study were 105 African American women between the ages of 45-70 who were recruited during regularly scheduled visits to the clinic. They were classified according to the exercise stage of change and their levels of self-determination were assessed. For this study, a convenience sample of three women from the less physically active group, who have made the decision to initiate a program of regular physical activity, and three women who reported that they have engaged regular activity over a period of six months. Demographic profiles are illustrated in table 1.

Interviews

The interview protocols used in this study to explore women's experiences related to their physical activity choices were adapted from an earlier study (Solmon, et al., 2002). Interview questions were selected based on queries designed to elicit issues specifically related to the constructs from SDT. These encompassed autonomy, competence, and relatedness in relation to barriers and facilitators of physical activity. In the interview, questions encompassed issues concerning perceptions of control over their health, definitions of health and exercise, and goals for health and exercise in the past, present, and future. In the second, extended interview, questions focused on related life experiences which influence physical activity behavior and concerns associated with their current health status and how those concerns influence exercise behavior choices.

Table 1

Case Demographic Profiles

	Less Active			Active		
	Rose	Renee	Kim	Gloria	Olivia	Ellen
Age	56	49	52	62	67	60
Height	5'4	5'6	5'0	5'10	5'4	5'4
Weight (lbs.)	186	212	186	208	155	254
BMI (kg/m2)	32	34	36	30	26	43
Marital status	separated	married	married	single	divorced	married
# of children	5	0	4	0	1	0
Highest level of education	high school	high school	high school	Master's degree	Trade school	College graduate
Medical /financial class	Self pay	Commercial insurance	Free care	Commercial insurance	Medicare	Free care

Instruments

Data sources included demographic data, two interview sessions, medical chart review, daily activity log, and two surveys. Descriptive demographic data collected included age, marital status, height, weight, number of children, and body mass index (BMI, kg/m2), medical care coverage financial class and education level. Medical care coverage financial class is a classification system used by medical care facilities to categorize medical care recipients into financial class categories that describe the source of payment the patient uses. BMI is a computation of height and weight, which can be used to estimate potential health risk associated with obesity (Howley & Franks, 1997).

The Stages of Exercise Scale (SOES). Stage of exercise scale (Cardinal, 1995) is based on the Transtheoretical Model of behavior change (Prochaska et al., 1994) and construct validity has been supported with female subjects. The SOES resembles a ladder with each rung representing a different stage: precontemplation, contemplation, preparation, action and maintenance. The stages are determined by the respondents' choice of a statement that best describes her current degree of interest in physical activity and actual physical activity involvement. Preparation stage is illustrated by the statement: "I presently get some exercise but not regularly." Maintenance stage is illustrated by the statement: "I presently exercise on a regular basis and have done so for longer than six months." Due to the varying level of literacy of these participants, this instrument was given orally in an interview setting.

Behavior Regulation Exercise Questionnaire (BREQ). Mulland, Markland, and Ingledew (1997) developed the BREQ to measure the following constructs: external regulation, introjected regulation, identified regulation, and intrinsic motivation, which are then used to calculate the Relative Autonomy Index (RAI, Ryan & Connell, 1989). The RAI score is a

combination of the subscale scores providing an overall self-determined regulation score. The 15-item, 4-point likert-type scale questionnaire was given orally following the SOES.

Cross-Cultural Activity Patrticipation Survey (CAPS) Physical activity log. CAPS Physical activity log is a one-page log with multiple items describing possible activities one might engage in during a given day (Ainsworth, 2000; Ainsworth, Irwin, Addy, Whitt, & Stolarczyk,1999). Participants were asked to record daily activity on this log for any two given weekdays and one weekend day (total of three days).

Procedures

A multiple case study design (Yin, 1994) guided the data collection of this study. Initial data collection and initial interviewing took place at the medical clinic at the time the patient enrolled. Demographic data were obtained after potential participants were identified, informed of the details of the study, and agreed to participate. Participation was voluntary and consent was obtained. All participants were interviewed using a standardized interview protocol.

The initial interview and survey collection ranged in length between 10 and 25 minutes. The second interview lasted from half an hour to an hour and a half and was held a the same medical facility. Interviews took place in a private room and were audio taped. Physical activity logs were completed by participants within the two weeks following the second interview. Medical chart reviews were completed after all secondary interviews were complete. Data collection extended over a four-month period.

Data Analysis

Stage of exercise was assessed using the adapted interview questions based on Cardinal's (1995) SOES. The BREQ (Mulland, Markland, & Ingledew, 1997) was scored by compiling separate subscale scores (external, introjected, identified and intrinsic motivation) and calculating the RAI (Ryan & Connell, 1989).

Interviews were transcribed verbatim for analysis. Data were analyzed by identifying units relating to definitions of health, autonomy, relatedness and facilitators and barriers to physical activity to allow themes to emerge. Data were also analyzed for similarities and differences between and within the active and less active groups and from a holistic approach.

The triangulation (Patton, 1990) of data began with examining all data sources individually and collectively. Data sources were integrated and themes emerged using constant comparison (Lincoln & Guba, 1985). Trustworthiness and credibility were established through member checks throughout the analysis process (Patton, 1990). Member check was completed by meeting with women from the participant group and non participants from the same demographic group to discuss preliminary and final study findings. In addition, participants agreed to be available by phone or in person as the analysis progressed.

Each case is presented in a profile, which includes general personal history and background, and a description of physical activity patterns including the results of the survey instrument. This is followed by a summary of the interview responses, addressing issues of motivation, beliefs and experiences, and perceptions of health status. All cases are presented individually with the less active cases preceding the active cases.

Findings

Rose

Rose is the oldest of ten children. She has a high school education. Her childhood family memories include the instruction that she was destined to get married, move away and have children of her own some day. Rose remembers a very non-social household while growing up. Her family spent time together but rarely visited other people.

> I feel like when we were growing up my daddy didn't let us go no where. If you wanted to go play ball, go out there and play …and we didn't go visit nobody, we didn't go spend the night with nobody, we stayed home.

She married a service man rather young in life and had five children. As an adult, her solitary family behaviors from childhood became evident, as she was very reluctant to socialize. "I stayed home because I grew up like that. No. I don't go to nobody's house. And I don't have visitors come."

Physical activity patterns. Rose was fairly active as a child and adolescent, as she played basketball in high school. She recalls her physical activity level falling around the time of her marriage and especially at the time of the birth of her children. "When the kids came look like everything else stopped." Recently, Rose has begun an exercise routine that she attributes to a change in mind set while recovering from a broken arm.

> I've been going to the gym. I've been swimming, learning how, and I'm just doing things now for myself. When I broke my arm, my elbow, this time and I just made up my mind. I couldn't do for myself and I didn't like that at all.

Rose believes exercise is important to her health because of her recent experiences while beginning an exercise routine, as she states: " I know cause I have to just push myself because when I exercise I feel good…. Then I know I have reached my goal." An interesting component of Rose's view of her physical activity level is how her view of her activity level changes depending on the context of the discussion. For example, as active as she describes herself, she still seems to under report her activity at different times during the interview. When asked about what type of activities would count for exercise, she replied, "If I was active…, I would try to move more, I use my left arm more because that's the one that was broke to give it, cause it won't reach all the way like this one, and I try to use it more." Yet when asked to explain her current physical activity, Rose's response was, "I walk in the morning every day from Monday's to Saturday one hour. And I do yoga… when I finish walking I go to the pool and swim." She

provided many examples of being active, yet began her response with "If I were active." Rose's stage of exercise change is preparation based on her response to the SOES questionnaire. When reviewing her physical activity log (CAPS), Rose's recorded activity level closely follows her interview report of her activity level.

At the beginning of the interview, Rose was adamant about her motivation for her new physical activity regiment due to her recent injury rehabilitation experience. She describes this new mind set in relation to the fear of becoming dependent. Even before her recent injury she experienced the fear of dependency from observing health problems of other family members:

> I don't want my muscles tighten up. We have an aunt that she didn't do a lot and she started drawing up like that. And I didn't want to be like that. And she never did stand up straight anymore. That's why a lot of time I'll think about it and I'll start to sit straighter to keep from bending over. When I walk I walk up straight without humped over so I won't have a hump right her. She had a hump and I've been concerned about that, not having a hump there…You just do that and get old and die like the old people do, you know. Yeah, and just the thought of you're going to die, see daddy died young, well he was fifty something. I was fifty-two I feel like I was due to die too [after the injury]. I was going to be crippled and die.

Beliefs and experiences. What seems to be different from her injury experience and her appreciation of dependence, old age, or death, is the sudden connection between exercise and a desired outcome. For example, when asked "Did a doctor ever tell you to exercise?" Rose responded, "Yes, when I started coming to the doctor for my legs and was hurting a lot. And he had said 'exercise' and gave me a paper to do a lot of leg exercises and stuff like that." Then after her injury, her physical therapist gave her rehabilitation exercises. From these experiences, with support from medical personnel, Rose made the connection, both mentally and physically, between the physical benefits of exercise and her health status.

Even though Rose doesn't recall ever having a role model, she does seem to get inspiration and motivation from her sister who also once had a weight problem and has been successful at losing weight and keeping it off:

> …She keeps her hair done. I started trying to do my nails and stuff. She keeps her hair fixed all the time. She wear nice clothes…. She is always healthy like that. Chris, she is nice and she is little and she is always healthy.

At the time of our interview, she admitted to trusting few people and having few friends. Rose's sister is her closest friend. She is currently trying to attend classes at the local community college and make new friends at church as well as at the facility where she recently began her work outs. She admits having low self esteem, but that seems to be improving with her increase in physical activity, as she remarked, "I'm just now really beginning to like myself."

Health status. Her medical chart from the four previous years revealed, and Rose confirmed in her interview, that she doesn't visit the doctor often. She was diagnosed with degenerative joint disease earlier this year. Her chart also indicated that she was counseled for being over weight and obese, needing to exercise and increase her activity level, and was referred to the dietician in the past year. Furthermore, over the past year her weight had been steady around 190 lbs., with a considerable drop this year occurring around the time of her injury. It is important to note, however, that her counseling for items related to weight, such as diet and exercise, only occurred very recently, yet her weight has been high for at least the past four years. As a child Rose experienced no major injuries or illnesses. In fact, her injury this year is the only major injury or illness she recalls even as an adult. Rose acknowledges that her weight gain probably began with the birth of her children. She remembers her husband suggesting that she "take care of her self," but he never really pushing the issue. When asked regarding her feelings about her weight gain she said:

> No, I just really didn't let it bother me. Because I felt like, I don't know, something my grandmother had said one time, “We was big-boned people and we gonna be big, don't even worry about it…" That was how we were supposed to be.

Rose has had problems with pain in her legs as an adult, for which she was told to lose weight and exercise about four years ago. When asked why, only now, did she decide to follow the doctor’s recommendations, she replied:

> When I got to where I couldn't move, couldn't do things, and my leg started hurting or something like that, that's when I - I kept putting it off and putting it off. I said "I'm going to start exercising, I'm going to start doing this, I'm going to start walking.”

Something seemed to click with her injury this year, as again a doctor recommended she lose weight and exercise.

> When I fell I just made up my mind,… She said "If you get the weight off the leg you wouldn't always complain of your knee hurting, it wouldn't slip out of place." So I did. I'm going to get it off. I was tired of hurting.

Rose expresses her perception of health through her desire to stay independent. This is evident not only by her timing of heeding her doctor’s advice but also from her definition of health:

> To me what it means to be healthy where I can do things that I want to do, go where I want to go without anybody assisting me. And I don't want to get old and have to be …. I want to have my good health and in my right mind.

When asked about her perceived control of her health she first responded as if it is not controllable, by saying "It's just how it is." But then she follows with a remarkable response of self-determination:

> I fell and broke my elbow, and yet my knee has slipped out of place out in February and I said, I just made up my mind that I'm going to eat right, I'm going to take care of myself, I'm getting too old to be letting myself go. Nobody to care about me but me…and I'm going to start taking care of myself. And since February this year I've been taking care of myself, eating right.

Case summary: Rose. Rose's self-reported exercise data from the questionnaires, activity logs, and interviews all indicate that she is beginning to become active. A focal point of this case is what contributed to this recent adoption of activity and the presence of uncertainly in describing herself as active. Rose's desire to stay independent is a key factor to her lifestyle behavior. When Rose perceived her health status as a threat to her independence, she made the connection that exercise could mediate her health status, and her motivation to exercise was born. Rose still does not see herself as "active," but now that she is engaging in a regular walking program, she sees herself as "healthy" which to her is being able to take care of herself. Her rehabilitation experience increased feelings of competence related to exercise that gave her a sense of hope and accomplishment. Lastly, her relationship with her sister allows her to connect with another "big" woman who has successfully overcome barriers such as weight.

Renee

Renee is from a large family of six sisters and two brothers and has memories of a very happy childhood. The oldest child in her family, Renee has a high school education and currently works shift work at local meat processing plant. As a teenager, she enjoyed going out, being with people, and spent a lot of her time cooking and cleaning for her family. Renee grew up in a rural area, with fresh vegetables and lots of farm animals.

Physical activity patterns. Renee recalls being a physically active child while growing up. She played sports in middle school and "took P.E." every day all the way through high school. She loved to go dancing as a teenager and still enjoys dancing as an adult when she gets the opportunity. Around the time she got married is when she recalls becoming less active than she was as a teenager. Renee acknowledges the importance of exercise and relates its importance to how she feels:

> Yes, I was walking, I could walk and I wouldn't get tired. But since I hadn't been walking, like when I go from the parking lot and get to the plant, I could tell that I hadn't been exercising because I would be tired…So exercise is, walking is, exercise is real good.

Currently, Renee, is trying to become active again by providing herself with different options to exercise:

> Now I'm back walking and riding the treadmill, and that's mostly what I'm doing. And I bought a bicycle but I hadn't got on it yet to ride. Cause I'm waiting to get me a bigger seat. It's got a small seat.

She has tried to walk before but has not been successful at maintaining regularity. This time she is motivated by the desire to lose weight, which is ultimately connected to the desire to reduce her medication and avoid dialysis:

> And then if I exercise more, cause when I would exercise I would lose the weight more. So I really hadn't been walking like I should. Cause when I was walking I was really losing the weight…. I plan on it, cause I don't want to get on that dialysis.

Renee requests encouragement during the interview when asked what it would take for her to become active regularly:

> I guess just have faith in me, cause that's what I'm trying to have faith in myself to start trying to lose weight. Try to have faith in me that I'm going to do - when I come back I'm going to try and have lost some of this weight. I'm hoping they tell me six months this time before I come back. I'm going to try and lose some of this weight. But I'm doing good for that fried food, so as long as I keep away from that fried food.

Renee's exercise stage is preparation, as she has not yet been regularly engaged in physical activity. Her physical activity log illustrates a consistent effort to incorporate activity into her life. She reports getting some exercise from her job which requires strenuous labor. Her "mainstay," or choice exercise, is walking. When describing what counts for exercise, she said:

> Mow the yard, yeah I mow the yard all the time, I do that. Most time I just walk, when I really exercised, I mostly walked. I got benefit more out the walk than I did the

> treadmill. But I got the treadmill so when I couldn't walk I could do it in the house… just mostly walking about the only thing that I do, and try to watch what I eat and that's it. Cause I don't really have to have 'cause I already work some.

Beliefs and experiences. Renee's experience with weight fluctuation has been ongoing. Her beliefs about her family genetic history seem to undermine her motivation at times, "Well mostly just I don't know, I guess it's just, most of my family is large people. We don't really have small people." She has had some success, but it was not an approach she could adhere to as a life style change, as she described, "Well, mostly watch what I eat, and exercise. I got on an applesauce and crackers, and water like that, and make me Jell-O. That's how I got it off before." Renee's closeness to her family has also been somewhat of a challenge to her personal health goals. Although it has taken a while, she has recently learned from experience how to take care of herself while taking care of her loved ones. For example, taking care of her needs did not seem to be an option when her parents were sick:

> Up and down, up and down, um hum. I always try to keep it - I never wanted to be really thick, you know, trying to keep it under control. Then when I got where my momma got sick, my daddy got sick, and I didn't have time to think about myself caught between those two trying to figure out both of them running back to the hospital. So I didn't have time to keep it under control. I didn't have time to exercise, you know, watch what I eat, because I was on the go all the time. We didn't have time to stop, I just eat fast food.

However, recently her sister became ill. When asked if she had trouble this time, she replied, "No, not with her I didn't, cause I know now I got watch it."

Renee has several people in her family who have benefitted from walking. Her two sisters, one of whom is her walking partner, are walkers. Although her husband doesn't bring up her weight gain or health problems, he has also provided an example of the benefits of exercise. He was recently taken off of his blood pressure medication because he had started walking. Renee says she gets no encouragement from anyone but her sisters. When asked about

motivation, she believes it is a matter of mind set. However, this seems easily deterred in a given context:

> Well when we first - it was something I really wanted to do, you know. Yeah, I did it. And it was easy for me to do, but like now, I guess because I had my mind made up, and that's what I wanted to do, and like now, it's harder for me. I don't know cause it's the way the heat is now. That's what it is. I found reasons, cause I can't take the heat.

Health status. Renee recalls being physically healthy as a child and teenager. After getting married, and in the process of trying to get pregnant, she found out she had high blood pressure, which runs in her family. Both parents and two siblings have been diagnosed as hypertensive. Renee currently is experiencing kidney problems after years of high blood pressure. Otherwise, Renee feels healthy because her blood pressure is now under control.

Her definition of health underscores her focus on her efforts to lose weight:

> Being healthy mean taking care of yourself, and eating the right food, and sticking to the right diet. And like me, I have to be on the right diet. Like getting away from the fried foods, they don't let me have fried foods or nothing like that.

Control of her blood pressure is attributed to her medication adherence, but her desire to lose weight is her way of controlling her kidney problems and reducing the costs associated with the large amount of medication she is currently taking. Renee explains that she feels she has control of her health status:

> I don't feel like just cause I have high blood pressure that this is the way it's going to be. I feel like I got high blood pressure, and I want to lose this weight. And I feel like if I lose this weight, they will take me off of some of this medicine that I'm taking. If I get down, and watch my cholesterol. The cholesterol, that's the most thing, if I could get off those cholesterol pills. And lose weight. I could deal with the blood pressure pills. I don't want to take any more medicine, cause I'm taking enough now.

The review of Renee's medical chart confirmed her high blood pressure, high cholesterol and kidney problems. She has been counseled several times over the past four years about

obesity, the need for exercise or activity, and has been referred to and seen a dietician. According to her medical chart, her weight dropped quite a bit a couple of years ago and stabilized, and then began to go up again. However, she recently has lost some weight. She is on several medications, as she reported. Her chart review indicates that he nephrology clinic appointments initiated most of the consultations regarding the need for weight loss and exercise, and she confirmed that in her interview.

Case summary: Renee. Renee is focused on her need to lose weight. This focus is directly related to her health status. She believes the utility of exercise is weight loss and weight loss equals avoiding dialysis. Renee has a small support system but several good experiences, which have allowed her to make a connection between a desired outcome and her ability to incorporate exercise into her daily life. Renee seems to lack an understanding of exercise as prevention for long term health benefits. Rather, she sees exercise as a short term fix to her need to lose weight and reduce medical expenses.

Kim

Kim is from a family of four brothers and two sisters. She recalls a very happy and family oriented childhood, "whatever we did they were basically there with us." Kim completed her high school education and then married at the age of sixteen.

Physical activity patterns. As a child and teenager, Kim was very active in sports. After getting married, her physical activity level actually increased as she married a service man who was very active. After she began to have a family, she remained somewhat active by walking and caring for the children:

> I'd walk, but it wasn't for my health. I'd just walk because I liked to visit. When they were in school I was running behind them, I didn't need an exercise regimen because at the time I really didn't need to. I mean I was in pretty good shape. And running with them, running after little kids, you don't need to exercise. That's a full time exercise regimen by itself.

Currently, she walks very little, as she described, "I might walk a quarter of a mile about twice a month," due to pain associated with her arthritis and complications with Lupus, and suffering two strokes. She uses a cane from time to time, depending on her schedule and muscle soreness.

Kim describes exercise as walking, running, and using exercise machines. Her physical activity log confirms her interview illustrating very little daily activity. Kim's stage of exercise is preparation, as she is walking on occasion. Despite stating she doesn't exercise much, she still describes herself as active because she is able to get around and enjoys going places such as church. The importance of physical activity to Kim seems evident from the following quote:

> Well, like I said I loved it before I did it and I also look at a lot of television and I do a lot of my own personal research and I've learned that even with these illnesses the more active you can stay the chances of the longevity.

Even though she thinks exercise is important, she doesn't think it will change her current health status. At first glance, it would seem her current physical limitations might hinder her physical activity participation. For example, Kim's response to the question, what could I do for you to get you more active, was "Give me a new body. A perfect, no pain, no disease, no nothing." Clearly, her physical limitations constitute a barrier:

> Course I find with that, that depends on the Lord, with all of that, regardless of what man says. It's just the fact that I like doing it. It's just fun to me. Oh yes ma'am, while I'm walking, I'll become totally paralyzed, and for like five sometimes ten minutes I have to stand still in order for my body to…I have to consider, well is it worth the risk. And you have to pray a lot. I pray a lot and say 'Well okay Lord, you say you are going to take care of me so I'm not going to worry about it. I'm going to.' And then I take a lot of muscle relaxer's and pills, you know to help me, and that helps me also. I mostly just turn it over into the hands of the Lord and say okay, I'm going out there and that I'm going to be all right.

Later in the interview, however, it seems Kim doesn't believe physical activity a priority, as the following dialogue illustrates:

The interviewer (I): Tell me about the days that you do those exercises, or you walk. What is different about those days from when you don't? Now I don't mean when you get up hurting. I mean when you just get up and decide to do them, what gets you to do that?
K: Well I get up and say, 'Well, I couldn't get in that dress yesterday; it is a little tight around the waist. I think I better put in a mile or you know kind of bounce some of these pounds off.' Or maybe I have a little digestive problem and decide well, it's about time I try to get these things to working right. And then you get up and I feel pretty good, I think I can do this, so why not.
I: And if you're not in pain it's based on?
K: Dress size, I'm in a good mood, and I'm bored and I need something to do, so why not exercise, I hadn't done it, so why not get out and try it.
I: Do you think you have a choice to be physically active?
K: No, I have a choice to try, but whether I have a choice or not I don't know. I really can't answer that because I don't know.
I: Do you think you need to exercise to feel better?
K: No
I: Do you think it's important to any degree?
K: Yes, I think it's - spiritually it's good. It is sort of a self motivation. 'Hey I can', it's kind of like the little engine, "I think I can I think I can."
I: It's like a challenge? And when you are bored you like a challenge?
K: Yeah.
I: But it is not something you think you've got to have?
K: No, I don't have to have it. I mean there are other things. You clean up your house you are getting exercise. But it's the stuff I like to do, I enjoy doing it.
I: What would make it a big deal? What would make you "Oh my gosh I have got to walk every day!" or "I have got to get moving no matter what pain I'm in." What would get you to think that way?
K: I have no idea, it is going to have to be a mighty big something.
I: It's just not important?
K: No it just isn't, the only thing I think would push me a little more is my father, who is eighty-two years old, who is getting out there and walking every day. And I'd say 'Hey if he can do it, I know I can do it.'
I: So you are not sure if you can do it?
K: Sometimes no, because he has arthritis too, and he is on a walker. But now if he get out there and make a lot of effort I know, hey I've got to figure out what he is doing and I'm going to have to do this a little better.
I: So if I found somebody that had arthritis, similar background to you, and I introduced you , and they are walking every day, would that be something good for you? Would that help you any, change your mind?
K: I don't know if it would change it, but it would make me very curious.

Beliefs and experiences. Kim states she has lots of encouragement from family and friends to deal with her illnesses. Kim draws strength by recalling the women of her childhood who set examples of good parenting, going to church, taking care of your neighbor, and being

with family. Kim's health goal is to lose weight by the end of the year through the changing of her eating habits. When asked if this will be a goal hard to attain, she replies, "Not really. I think once you make up your mind and put a lot of effort, you can do it. I think it's the mental attitude."

Health status. Kim defined health like this:

> Being in good shape, physically and mentally. Whatever is required of the body for it to - you know for you to have limited amount of illnesses. No cancer, no heart trouble, especially heart disease, but maybe a little trouble, but nothing major like heart disease stuff like that. Not on drugs, no more than what's prescribed with minimal use, you know not long. And not over a long period of time, you know maybe six months, three months. And a person that I would say continue, interested in education.

She considers herself mentally healthy, yet not physically healthy, and has a family history of heart disease and arthritis. Kim reports suffering from two strokes, a heart attack, angina, arthritis, asthma, hypertension, digestive problems, and Lupus.

A review of her medical chart confirms her illnesses and plenty of medication to treat the illnesses. The chart also shows her weight peaking last year at almost 200 pounds, but her weight is currently on the decline. Also, she received counseling on diet and exercise about once a year in the last two years.

Case summary: Kim. Kim's physical activity pattern is definitely limited by her current physical condition. Kim may also be limited by her uncertainty of the relationship between physical activity and her health status. As evident from her interview, she may believe exercise is important, but it is not a priority for her personally. The low priority she has for exercise might be explained in the context of the combination of health problems that she experiences. Her health status seems to weaken her sense of control over her health (autonomy) and her confidence that she can exercise and improve her health (competence)

Gloria

Gloria is from a small family and has one sibling. While in collage, she earned her master's degree in mathematics. Gloria enjoys being around young people, especially her nieces.

Physical activity patterns. Gloria was active as a child, enjoying playing outside. She did not participate in sports because her mother did not want her to be involved in sports. Gloria did participate in physical education class at school but it was not something she really enjoyed. She also participated in physical education in college as a freshman. After her freshman year of college, the only physical activity she participated in was walking for transportation purposes.

In her late twenty's she began to exercise, on and off, after reading about its health benefits. Since that time, Gloria has tried to remain active, alternating between different types of exercise, from home exercise machines to walking. Her stage of exercise is maintenance as she has been active for years. The physical activity log affirms her interview in regard to her activity level.

Gloria's main barrier to exercise is the weather. Even if the weather is bad, she makes choices such as taking the stairs or parking far away, to make up for her missed walk. Gloria chooses to remain physically active. The only time she has ever had a walking partner was when she was there to help motivate her partner. Besides having a strong sense of determination to stay physically active, she is also motivated by individuals who do not exercise, as she commented, "I've seen people who weren't active, and I don't want to be like they are. They need help for everything. I'm getting in the age group where they are and I don't want to be like that." Her only request with regard to things that would help her to maintain her activity level was, "Just keep encouraging me, that's all."

Gloria is definitely motivated by encouragement and approval, as she described, "I told somebody one time, I worked out this morning for 45 minutes, they said, 'Oh, that's great!' So then I go do it tomorrow." Interestingly, given her physical activity level, she does not recall

experiences with the medical profession concerning exercise. She had never been encouraged nor praised for her activity level by a medical professional.

Beliefs and experiences. When asked about having any role models in her lifetime, Gloria responds that she has had none, commenting, "No, I'm satisfied with myself." She does enjoy several close friends, but said that they have very different ideas related to health and exercise than she does, so she doesn't really get encouragement from them. Gloria is very focused about her own decisions, and views herself as independent and autonomous:

> I've always done my own thing. I'm not too easily influenced by other people. I just decide what I'm going to do and that's what I do Well anything you do you either choose to do that or somebody forces you. And if somebody is going to force me, I'm not going to do it, so it was a choice I made.

Health status. As a child, Gloria suffered from asthma, which she outgrew. Although her knowledge of her family medical history is limited, she is aware of her family history of heart disease. Gloria attributes a large part of her health to her eating habits. She was raised not to eat junk food, and to always eat fruit, vegetables, breakfast, and no fried foods.

Gloria has high blood pressure and she is on medication for that, but otherwise "feels good." She defines health conditionally based on how an individual feels, "Well, my definition of health would depend on how you feel. I feel good most of the time. How, you know you're feeling, get up and move around and do whatever you want to do. Eating right." She feels she has control of her health by taking her medication, monitoring her blood pressure, and maintaining an exercise program along with a healthy diet. Gloria's only goal pertaining to her health is to lose some weight.

Review of Gloria's medical chart confirmed her self-report of high blood pressure. She is also suffering from kidney problems associated with her hypertension. According to her chart,

she received counseling related to obesity and being overweight only once this year. Her weight has remained somewhat steady over the last two years, fluctuating between 200 and 210 lbs.

Case summary: Gloria. This woman is very self-determined. She is active and is not bothered if her closest friends or relatives choose to be active or not. However, she does seek out more encouragement from others, and she seems to respond positively to that. Her main facilitator seems to be her competence or experiences related to her long-term physical activity level in addition to avoiding dependence as she ages.

Olivia

Olivia is the youngest of five children, having three sisters and one brother. One of her favorite things to do as a child was to read. She was raised with a great deal of emphasis on healthy eating such as fresh fruit and vegetables, and little red meat. Olivia's education includes completion of high school, correspondence courses, seminars, and job training.

Physical activity patterns. As a child, Olivia stayed active by walking to school several miles and at home by always staying busy. She explains: "because at that time the concept was 'An idle mind is the devil's workshop.' And you get up and you do something." Olivia has always enjoyed walking, even as a young child. She also participated in physical education in school and other activities through recreation available at local parks.

After Olivia got married she remained active, but more for appearance reasons. In an effort to discover beauty secrets, she learned more about what she refers to as "health secrets." Even though her husband was not active, Olivia remained active of her own volition, as she indicated, "Oh nothing deters me. It doesn't matter what the next guy is doing."

Olivia has always felt encouraged by the medical field to maintain her physical activity. She really appreciates this encouragement, as she feels she has never received any from her family or friends. Her physical activity log confirms her active lifestyle. Her stage of exercise is

maintenance, as she has been consistently active for many years. Olivia incorporates a variety of activities into her idea of what counts for exercise:

> …walking…. yard work, three to four hours of yard work, …calisthenics, on the floor, one, two, three, etc. And I do things all through the day. If I go to the bathroom, or something, I might twist in there a minute before I come out…. hand strengthening…When I'm sitting having a conversation I'll do my legs like this...

Beliefs and experiences. Olivia's mother died at a very young age, leaving her large family to be raised by her husband. Olivia's father left the family for about a year when Olivia was only fourteen, and they had to, as she said, "fend for ourselves." Later, after a short stay with family members, the children rejoined their father. Olivia shares a very close relationship with her siblings, yet has few close friends.

Given Olivia's childhood, her view of the origins of her personality traits are of interest. She believed her mother taught her she had choices concerning her mental and physical well-being, that her father, or men, taught her competence:

> From the men. I think I always had some of it. I think it was just kind of inborn. But what really I think put a cap on that was, I wanted to be equal to do what the men did. The men could go and come when they get ready, and they went and came when they got ready no matter what. Because I always thought I could do whatever they - I could see he wasn't doing, he or they wasn't doing anything that was difficult. What I saw was, the difference between men and women was independence, money. You have to have your own resources to keep up with the man. Otherwise, he uses that against you to keep you where he wants you to be. And I'm not bitter against men; it's just that I learned a lesson from them. I don't care how good you are, how faithful you are, and how true you are. Men do what they want to do when they get ready to do it. And my contingency - and I wanted to do that. I liked that concept. And I said I don't know any other way to do that but to have my own.

Olivia believes her health is a combination of self-esteem, medical adherence, and self-care. When asked what will keep her active, she replied, "The desire, the like of it, the desire to be healthy. To feel good, to think well. I know that the people who are sick don't think as well as those who aren't."

Health status. Olivia has a family history of heart disease and breast cancer. Being very proactive, Olivia continuously asks for heath screenings. For example, when her sister had heart surgery, she became concerned and requested her own stress test. She attributes her healthy lifestyle to her mother and having lived in California:

> You see in California, in my environment anyway, you get up, you get dressed, you look nice, you eat light, good food, and you cook and you look your very best and you, you know, you want to run in the - you just want to be a part of the healthy crowd. And here, I don't see the desire of women to fix themselves up like they do in California.

Independence is the emphasis of Olivia's definition of health as illustrated by the following quote:

> What it means to me to be healthy is to be physically and mentally capable of doing the things I need to do for myself in an independent manner. And then it makes you look better. It makes you feel better. And definitely a health benefit.

Olivia's medical record indicated she has been health, consistent with her characterization in the interview. She has consistently maintained her weight between 154lbs - 161lbs. Exercise and diet counseling have only been charted once.

Case summary: Olivia. Olivia is a healthy, active woman. She is very driven by her beliefs concerning independence to be proactive in all areas discussed during the interview. She has definitely been shaped by her experiences as a young girl, regarding illness and dependence. Olivia's environmental influence of the socially desired healthy lifestyle also allowed her to incorporate physical activity into her life when most women are becoming less active.

Ellen

Ellen has one brother and one sister. She is a college graduate, majoring in education, teaching math and biology for a short time. Ellen recalls growing up with a family who ate healthily and cherished very religious family values.

Physical activity patterns. As a child, Ellen recalls loving the outdoors, and spending time with her family, and playing team sports with her family. She remembers a very active family, "We didn't have those people that sat around, laid around. This was of no use to nothing and nobody." In elementary and middle school she participated in physical education classes and in high school she competed in tennis. In her twenties and thirties she ran, played ball, and played tennis, up until her forties when she began to experience some health problems.

When her health problems began, her activity level dropped, "then after the surgery I didn't, I didn't really, I didn't have as much time it looked like. I have a lot of sickness in my family." After time passed, she began to walk to alleviate stress, and although she remains friends with her tennis buddies she doesn't play tennis any longer. She owns a treadmill, which allows her to exercise year round regardless of the weather. She states she stays active, because she wants too:

> You just do it. No, you've got to say, "Okay, if you do not continue doing this, your body will slow down." It slows down with age. It slows down with food. And if you just don't keep on going and pushing yourself then you get this attitude and you won't do it. And you know you need to do it so you just do it.

Ellen's doctor has consistently reinforced the importance of exercising for years. When asked what motivated her to exercise, she responded "health and habit." When asked to choose whether she exercise because she "had to" or "wanted to" she said it was because she enjoyed it. Her exercise stage is maintenance because of the length of time she has been active. When asked about what type of activities she thought would be considered as exercise, she included walking and household cleaning as exercise. Ellen's physical activity log suggests that she may underestimate her activity level. Her physical limitations are her barriers to physical activity. If her pain were not so great, she believes she would be much more active.

Beliefs and experiences. Taking time for herself was a lesson Ellen learned from her mother:

> My mama always said that we are supposed to have time for ourselves. Um hum. She did all the time. And she was not to be disturbed. Yeah, as long as you take time for yourself, then realize if you don't take care of yourself nobody else can. So you have to take care of yourself.

Mentally, Ellen is concerned about depression because of her multiple health problems. Ellen's solution to this concern is to surround herself with "young people." This strategy seems to be effective for her mental and physical health:

> Yep, I keep involved with them. You don't see young people taking time to stop for anything. So if you are going to follow them, you can't be dragging around I have plenty of energy when I'm with them. When I'm not with them, or when they're not around me, I just lay around. I can't do that. I'm a diabetic and I can't afford to.

Ellen also reports keeping a positive outlook by doing something for someone else every day and remembering her parent's example of never giving up when times get rough.

Ellen's quest to stay positive is evident by her comments concerning the medial profession. Ellen doesn't always believe everything doctors tell her, but she has learned with her diabetic diagnosis you have to make the decision to take care of yourself. She wants a doctor who is encouraging and thinks optimistically, as she commented, "I have handicap. Okay, don't teach me my handicap. Just ignore them like I do and keep me on the other side."

Ellen attributes a great deal of the control of her health to the spiritual domain. However, she also believes that to have control of one's health is a matter of choosing to survive with their current health status, based on the information he or she receives from the medical profession, as she describes:

> What you know, you have a choice. So whether you do something about it or just let it keep going the way it is;… I think I waited too late to make changes. Things that I have now are really out of my control.

Health status. Ellen recalls experiencing no major illnesses or injuries from her childhood through her thirties. Then, in her forties she began experiencing health problems, which led to a hysterectomy. Since that time, she has had breast surgery, back surgery, three biopsies, and her gallbladder has been removed. Ellen also suffers from degenerative joint disease and diabetes. Her family medical history includes breast cancer, diabetes, stroke, and leukemia. Ellen's definition of health also emphasized independence, "Not having pain, being a problem to anyone, not even to yourself. Not having to take medicine, I hate that." Given her list of medial problems it is understandable that she does not see herself as healthy, as she said, "My whole body is breaking down and destroying itself."

According to her medical chart, she is also diagnosed with hypertension, heart disease, spinal stenosis, hypothyroid, morbid obesity, and high cholesterol. She has received counseling on exercise and diet about twice a year over the last two years. Ellen has had numerous visits however, where counseling for weight loss, exercise, or diet was not noted. Her weight has been steady over the two previous years, around 240 lbs., but has been rising this year to a high of 258 lbs. Her medication list is extensive, which coincides with her distaste of being on medications.

Case summary: Ellen. Given Ellen's health problems, her activity level is impressive. Several times Ellen referred to her desire to stay independent. She seems to struggle however, with the fight to stay active, and expressed a level of uncertainty regarding how much physical activity could help her situation. She indicated that it may be too late to do much to help her physical health status or just to bear the pain to be active. Ellen's insistence to be surrounded by young people and to do something for others every day provides one with a glimpse into the life of a very tired but optimistically determined women.

Multiple Case Studies Findings

Across the case studies women shaped their physical activity patterns around their understanding of how physical activity would directly influence their health status. Ultimately, fear of poor health status and the desire to maintain independence from health costs, physical limitations related to their health, expected age related decline and their dependence on others mediated their physical activity patterns. For example, four participants specifically stated they exercised not for the primary purpose of enjoyment, but rather because they truly desired to remain independent by means of improving and/or maintaining their health status. This is consistent with other findings, which suggest that as women age they tend not only to change their types of physical activity, but also their incentives for participation in physical activity (CDC, 1995; Gill & Overdorf, 1994).

Perhaps the most powerful finding evident in the case studies is the effect the perception of an individual's health status can have on physical activity choices. It is logical to assume that an unhealthy individual would be less likely to be engaged in exercise compared to a healthy individual. However, in these cases, the perception of the limitations and/or stability of their health status that was more predictive of activity choices than the actual health status as defined by the medical profession. Physical activity patterns and health status profiles are presented for comparison in Table 2. Physical activity patterns are represented by average number of hours the participants recorded over three-days. This activity included outside and house hold chores, and other activities such as caring for others and is not exclusive of exercise for fitness only. Health status is represented by the number of diagnosed diseases documented from the participants' medical charts. Diseases are grouped with similar diagnoses. For example, cardiac problems are inclusive of many cardiac problems such as angina and a heart attack. When comparing the two groups, the health status (reflected in the frequency count of diagnosed

diseases) of women who had been exercising regularly over a long period of time, does not appear to be different from the three cases of the women who were just beginning to exercise.

Ellen's and Kim's cases provide an interesting contrast. Kim indicated that she did not even see exercise as an option because of her health status, that the conditions for which she was being treated left her unable to engage in an active lifestyle. Ellen, who had a comparable health profile when the number and severity of disease conditions were considered, valued physical activity as a means to combat the disease process, and although some remarks indicated she realized she might be losing ground, she was committed to maintaining her program of physical activity as a means to maintain her quality of life.

Given the comparable number of illnesses both groups experienced, their different physical activity patterns suggest health status has different meanings for different participants. Renee and Rose, for example, were trying to incorporate exercise into their lives. When they were asked about their reasons for changing their behavior, they both indicated a desire to change or prevent poor health status as a facilitator to begin exercising. All of the women who had been active over a long period of time had made the connection that physical activity was a means to maintain or improve the quality of their health status, and ultimately improve their quality of life. The women who were beginning to make the decision to include exercise in their daily lives seemed to be just beginning to make that connection.

Examination of the scores on the BREQ provides some insight into the levels of self-determination of the women in these case studies, and those scores are reported in Table 3. Although statistical comparisons between the two groups are not informative because of the small numbers, it is of interest to contrast their scores. The RAI's, an overall reflection of the level of self determination, of the women who are in the maintenance stage tend to be higher than those who have not been exercising regularly. Identified behavior regulation is considered

to be the beginning of behavior regulation by choice. Referred to as the "threshold of autonomy" (Whitehead, 1993), it is at this level that individuals move from engaging in a behavior because regularly over an extended period of time with those who were had not, their active and less active participants, and the scores on the identified regulation account for the difference between the two groups.

Two active participants, Gloria and Olivia, articulated this feeling of choice, suggesting that staying physically active is a part of their identity. Rose decided she could exercise after an injury, putting her own needs first after finally getting her children out on their own. Renee decided to attempt the negotiation of taking care of herself and her family instead of feeling she had to choose one or the other. These women have only recently begun to believe they could choose physical activity as a part of their lives.

Across case studies, when family responsibilities were a factor, women tended to perceive their care taking responsibilities as primary and taking care of themselves as secondary. Rose and Renee reported their activity levels dropped when their family demands increased. This finding is consistent with other qualitative studies (Harrington, Dawson, & Bolla, 1992; Henderson & Allen, 1991) that have suggested that women's "ethic of care" (Gilligan, 1982) constrained physical activity because women often provide for the needs of others, neglecting their own.

Participants included non-traditional activities such as household chores and yard work when they were asked to describe their physical activity. Ainsworth (2000), in her discussion of issues associated with the assessment of physical activity for women, calls for the development of culturally relevant and meaningful surveys for women to more accurately assess activity levels. She suggests that when surveys include activities such as housework and family care

Table 2

Comparison of Physical Activity Patterns and Health Status Profiles

		Less Active			Active		
		Rose	Renee	Kim	Gloria	Olivia	Ellen
Stage of change		Pre-paration	Pre-paration	Pre-paration	Mainten-ance	Mainten-ance	Mainten-ance
CAPS (average hours a day of activity)		10 hours	5 ½ hours	½ hour	5 ½ hours	4 hours	7 hours
Diagnosed diseases							
	Gastro-intestinal	X		X	X		X
	Joint related	X		X		X	X
	High blood pressure		X	X	X	X	X
	High cholesterol		X	X			X
	Reproductive system related cancer		X		X		X
	Kidney problems		X	X	X		
	Cardiac issues			X			X
	Bell's palsy			X			
	Asthma			X			
	Endocrine system						X
	Diabetes						X

Table 3

RAI and BREQ Subscale Scores

	Preparation			Mean	Maintenance			Mean
Participant	Rose	Renee	Kim		Gloria	Olivia	Ellen	
RAI	32	20	32	28	38	40	32	37
External	0	2	0	.66	0	0	0	0
Introjected	4	6	0	3.33	0	6	4	3.33
Identified	12	10	4	8.66	12	16	16	14.66
Intrinsic	12	10	14	12	13	15	10	12.66

activities and increased levels of physical activity are reported by women, associations between physical activity participation and health outcomes will become more evident. In this study, the majority of physical activity log entries were associated with household duties, care for others, and walking categories. This supports the notion that traditional sport related categories might not be useful when exploring measures of physical activity in African American women.

All participants requested information and ongoing encouragement from their health care providers regarding specific instructions and benefits to exercise. Williams and Deci (1998) investigated adherence to medical treatment and found autonomous motivation was strongly related to long-term medication adherence. Williams, Freedman and Deci (1998) continued this line of research by investigating the applicability of SDT nutriments with diabetic patients. Patients who felt supported in autonomous ways from health care providers tended to feel more competent about their treatment adherence.

All three participants who had not been exercising expressed concern about weight loss, however, to active participants the issue was less important. All the women, though, were aware of the link between diet and weight loss but they had less confidence in the link between exercise and weight loss. Most successful weight loss experiences seemed to focus more on diet than the combination of diet and exercise. Rose and Renee both made references during their interviews to shared family beliefs of being "big" or "large" people. Again, participants' understandings and beliefs about their health status, such being over weight, influenced their physical activity patterns. If women believe weight loss is only achieved through changes in diet, in combination with the belief that they are naturally large, they may be less likely to participate in physical activity for health benefits.

Summary and Discussion

The purpose of this multiple case study was to investigate middle aged and older African American women's lived experiences that shape their physical activity patterns. Through surveys, interviews, physical activity logs, and a medical chart review, data were triangulated to reveal three predominant threads interwoven through the case studies. These three factors combined to have a powerful influence on the participants' physical activity patterns.

1. The mediational power of the desire to maintain personal independence. These women expressed a strong desire to maintain their independence, and when they believed in the efficacy of regular activity as a means to do that, they chose to be active.
2. Participants' individual understandings, beliefs and life experiences about the benefits related to physical activity and their health status work to constrain or foster decisions to engage in physical activity.
3. The perception of control or a sense of autonomy that participants develop as a product of their understanding of their health status influences their physical activity patterns.

SDT provides a framework to interpret the findings of this study. Autonomy, relatedness and competence are nutriments of the SDT. All three nutriments are interconnected to one another based on participants life experiences. Consistent with the findings of Solmon et al. (2002), women who seemed to have a perception of control in their lives were able to successfully negotiate personal health and environmental factors to be active. These SDT nutriments are used to provide a framework from which to interpret the predominant threads of the findings of this study.

Autonomy is a degree to which individual takes action with a full sense of choice (Strauss & Ryan, 1987). Through the lens of SDT, many of the findings of this study are interrelated to women's autonomy associated with their understanding of their health status,

which in turn influenced their physical activity patterns. For instance, the belief that obesity is to be anticipated and accepted as part of ones' heritage influenced participants' beliefs in the efficacy of exercise and the autonomy of their personal struggle with weight control. Perceptions related to health status lead Kim to express feelings of helplessness due to her illnesses, and she did not believe that physical activity was not an option. She had little or no feeling of autonomy or choice concerning physical activity.

Current literature cites social support as an influential component to physical activity behavior and SDT construct of relatedness. The five women in this study who were active and those just beginning their efforts to exercise had well-established relationships, mostly with friends and family, which nurtured their efforts to remain active. Relatedness, by definition is a sense of connectedness, and is reciprocal in nature (Ryan & Deci, 2000). When the negotiation of the social context facilitated a sense of relatedness, or included not only caring for, but also being cared for, then women were more likely to be able to negotiate barriers into facilitators (Rigby, Deci, Patrick, & Ryan, 1992).

Participants' understandings of their health status and the implications and limitations related to their physical conditions shaped their physical activity behavior. In other words, an individual's perception of the benefits of incorporating physical activity into her life had to be linked to the outcome of improving one's health in order to maintain independence. Independence was not limited to taking care of ones' self but also be able to afford health care, such as medication, and participating in the desired lifestyle. The SDT nutriment competence is the belief that an individual is capable of producing a desired outcome. Findings of this study suggest active participants were more confident in their ability to achieve or maintain independence through exercise than the less active participants. Gloria and Olivia, who had maintained a regular program of physical activity over time were motivated by the desire to

remain independent. Rose and Renee, who were beginning to exercise, were also motivated by the desire to stay independent. This finding is congruent with Croson, Zhu, and Timm (2000), who suggest that a realization of the benefits of physical activity must first be realized before it is valued enough to be incorporated into an individual's lifestyle. These findings suggest active participants have remained active based on their competence gained from experiencing physical activity in their lives.

The implication here is that, if interventions to increase physical activity and ultimately improve women's health are to be successful, health care professionals must use strategies to empower women that address a woman's personal perceptions of control concerning her health. The findings of this study suggest women may need help to identify barriers related to their beliefs about their health status. If the belief that they are unable to engage in activity because of their health status is not mediated, then medical advice to exercise will have little, if any, impact. Personalized strategies are needed that will allow women to reframe and restructure their experiences and the meanings they have attached to physical activity and health status so that they can negotiate the barriers related to them.

Health care and health promotion professionals should capitalize on the message from these women. The message is very focused on the facilitating power of their health status in relation to their independence. Their perceptions of the association of physical activity and their current health status directly influenced their desire to maintain independence, which in turn mediated their physical activity pursuits. It is evident that African American women's experiences and understanding of their health status must be taken into account to understand and address issues regarding their engagement in physical activity. More research is needed to broaden the knowledge base of the experiences that influence middle aged and older African American women’s physical activity patterns.

CHAPTER 5: SUMMARY

Physical inactivity has been identified is a major health risk factor in our society (U. S. Department of Health and Human Services [USDHHS], 1996). For that reason, it is important to conduct research about the choices individuals make regarding their physical activity, with the goal of understanding how to encourage individuals to adopt and maintain physically active life styles, and that was the focus of this project. This three-phase study incorporated quantitative and qualitative methodologies to investigate physical activity behaviors in middle aged and older African American women. This population was chosen because they are the least active segment of our society.

Two theoretical approaches, Stage of Change Model (SCM) and Self-Determination Theory (SDT) were used as a framework throughout this project. The SCM identifies five stages to describe an individual's readiness to change: precontemplation, contemplation, preparation, action and maintenance. SDT is a theory of internalization and behavioral regulation (Deci & Ryan, 1985). Internalization is the process by which motivation for a behavior moves from more external regulation to more internal regulation (Deci, Eghrari, Patrick, & Leone, 1994). The view of motivation as a continuum from amotivation (lack of motivation) to extrinsic motivation (externally controlled motivation) to intrinsic motivation (for the activity itself) is an important construct that underlies SDT (Biddle, 1999). Autonomy, competence, and relatedness are three psychological nutriments that, according to SDT, facilitate the progression from amotivation to internal regulation.

In the first phase of this project, the relationship between self-determination in physical activity and the stage of change for physical activity of African American women was explored.

Participants were classified according to their stage of change and their level of self-determination was assessed using the Relative Autonomy Index (RAI). Motivational constructs measured by the RAI are external, introjected, identified and intrinsic behavior regulation.

Consistent with Mulland and Markland (1997), our findings suggest that behavior regulation becomes more self-determined as individuals move across the stages of exercise change. Specifically, individuals in action or maintenance stages who are engaging in a regular program of physical activity likely to be more self-determined than individuals in precontemplation or contemplation stages, who are not yet exercising. For the older African American women in this study, exercising because they wanted to achieve an outcome (identified regulation) was a more important factor in separating those who exercise regularly from those who do not than participating in physical activity out of enjoyment. Exercising out of a sense of guilt or obligation made a negative contribution in the discrimination between the groups, suggesting that source of motivation is not predictive of maintaining a program of physical activity. This study provided validation for this theoretical approach in a population of middle aged and older African American women and provided a solid ground in gaining a clearer understanding of the types of motivation most likely to contribute to the initiation and maintenance of an exercise behavior change in middle aged and older African American women.

This survey project was then followed by qualitative approaches which investigated the perceptions of this population and their previous lived experience's contributions to their exercise self-regulation. The second and third phases of the study were guided by the underlying assumption that the reasons African American women choose to be active or inactive can only be fully understood by carefully examining their perspectives.

In phase two, physically active and inactive women were purposively selected from the initial sample for in depth interviews examining their beliefs about physical activity and their rationales for the decisions they make. Physically active and inactive subgroups were determined by the stage of exercise change. Interview questions focused on the participants' understanding of control of health, importance of exercise, description of exercise and barriers to and facilitators of exercise through individual interviews. The categorical and contextual analysis of the interview data indicated that perceptions of health status were a powerful influence on physical activity behavior. Perceptions of health status reflected the beliefs individuals hold about a particular disease or physical condition, and the limitations it has on the individual's life. It was not enough to believe that exercise is good for you, as most of the participants verbalized that exercise was a good thing. Active participants believed exercise was a means to achieve or maintain a desired lifestyle. They believed in the efficacy of exercise as a way to mediate their health status. Inactive women believed that, because of the health problems, they were unable to exercise, and that did not make the connection that engaging in physical activity could improve their status.

The desired lifestyle is not a medically defined one, but it is an individually defined lifestyle based primarily on the need to maintain independence. If the "outside world" views an African American woman as unhealthy due to her BMI, high blood pressure or diabetes, these facts do not necessarily translate to these women as a need to exercise. Their desired lifestyle can be perceived as in danger by high medical costs, or the inability to take care of herself or her significant others. If exercise is presented and perceived as a personal possibility and a means by which the women can return to her desired lifestyle, then women seem to be more likely to

make the commitment to exercise regularly. Interventions viewing exercise and physical activity as a lifelong prevention of poor health is not valued by these women. In fact, poor health was often seen as a barrier to exercise instead of as a facilitator by those who were not active. Other obstacles may also come into play, but the negative perception of health status must be addressed before environmental and competence issues are negotiated.

Deci and Ryan's (1985) self-determination theory (SDT) provides a framework from which to interpret the results of this study, and to understand the underlying issues concerning the choices these women make in regard to their level of physical activity. Specifically, the active and inactive groups of women expressed a marked variance in perceptions of autonomy and competence related to their understanding of having or not having control of their health. The varied perceptions of autonomy and competence help to explain activity level differences. While all participants acknowledged the importance of physical activity to their health, the active women tended to focus more on the health benefits of being physically active regardless of their health status. On the other hand, the inactive women--due to their current health status and physical limitations were unsure of the direct benefits of physical activity. Regardless of other factors in their lives, active women are more grounded in those beliefs and values related to the health benefit of being and remaining active. Consistent with the findings of Solmon, Munro, Autrey and Landry (2002), women who seemed to have a perception of control in their lives were able to successfully negotiate barriers and ultimately initiate or maintain a program of physical activity.

Competence is one of the three SDT nutriments, and its role in self-regulation was evident in the findings of this study. Competence is defined as the belief that one is capable of

producing a desired outcome. In regard to this study, competence may be further defined as a belief in being able to exercise at all, extended to an ability to exercise to produce health benefits. It was evident in the responses of the inactive African American women that they lacked this sense of competence in matters relating to control of personal health and importance of physical activity, as well as barriers and facilitators in physical activity.

A multiple case study design was used for phase three of this project. Six women from the initial pool of participants agreed to take part in the extended investigation. Three women were in the maintenance stage of change and had maintained a program of regular physical activity for an extended period of time. The other three women were in the preparation stage and were trying to make the commitment to incorporate activity into their daily lives. The intent of this phase was to further investigate the life experiences of middle aged and older African American women and how those experiences influence their behavior choices regarding physical activity. Data sources included extended interviews, medical chart reviews, and a physical activity log.

Analysis of the case studies indicated that women shaped their physical activity patterns around their understanding of how physical activity would directly influence their desire to maintain independence from health costs, physical limitations related to their health, expected age related decline and their dependence on others. For the women who had not been active, physical activity was not seen in terms of prevention or treatment for these women. Their perceptions of the association of physical activity and their current health status as it directly influenced their desire to maintain independence mediated their physical activity pursuits. At best, physical activity was seen as a possible solution to their age related or genetically induced

physical decline instead of as a lifelong necessity. The women who had actively engaged in physical activity over an extended period of time had life experiences that convinced them of the value of including exercise in their lives. They were able to negotiate life circumstances to remain active. It is evident that African American women's experiences and understanding of their health status must be taken into account to understand and address issues regarding their engagement in physical activity.

Findings of these three studies support the use of the SDT as a viable framework for the investigation of African American women's physical activity choices. Across each phase of this project, identifying levels and sources of motivation, as well as exploring the influences of the social context in a particular stage of change has contributed to our understanding of factors that need to be considered when developing effective behavior change interventions in this population. SDT suggests that the maintenance of a behavior is more likely as it becomes more of a choice, and when that behavior is identified inclusively as a part of the individual self, and the results of these studies support that notion. Using the stages of change to differentiate levels of readiness for exercise and contrasting individuals across different stages contributed a better understanding of influential life events and their effect on women's choices.

Taken together, the findings from the three studies substantiate several conclusions. The nutriments of SDT were key elements in self-determined forms of motivation to be active. Active women had higher levels of self-determination in phase one, and the qualitative data in phases two and three indicate that self-determination evolved from sense of autonomy, competence, and relatedness in their pursuit of physical activity.

The middle aged and older African American women in this study did not exercise out a sense of guilt or obligation, and coercion, and reliance on those strategies by medical personnel seems unlikely to be effective in increasing their physical activity. When they chose to exercise, and maintain a level of activity over a period of time, they exhibited self-determined forms of motivation. In this study that meant wanting to exercise as a means of mediating health status and maintaining independence.

Successful intervention strategies to increase physical activity for inactive African American women must address their beliefs about the relationship between their current health status and physical activity. Strategies reinforcing higher levels of self-regulation are more likely to foster long term behavior change. Convincing African-American women that exercising is a viable means of improving or maintaining their current status, and fostering a belief that exercise is of value to them, is a potentially powerful element of a successful intervention.

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APPENDIX A: REVIEW OF LITERATURE

The 1996 Surgeon General's Report identified physical inactivity as a major health risk factor in our society [US Department of Health and Human Services (USDHHS), 1996b]. An increase of physical inactivity was evident in research findings reporting a corresponding increase in the prevalence of overweight adults in the U.S. (Kuczmarski, Flegal, Campbell, & Johnson, 1994). Physical inactivity manifests itself within a number of health problems, contributing to deaths from heart disease, stroke, and diabetes, and often compounding the severity of other chronic conditions (USDHHS, 1996b). Public health educators recommend that adults accumulate thirty minutes or more of physical activity most days of the week (Pate et al., 1995). Beyond the daily recommendations, there is also evidence that participation in even minimal amounts of physical activity can improve health status of individuals (Kujala, Kaprio, Sarna, & Koskenvuo, 1998; Kushi et al., 1997; Pate et al., 1995).

Physical activity's protective property is influential in all-cause mortality of both men and women (Blair et al., 1989; 1996). Women and men differ, however, with regard to predictors of all-cause mortality. According to Blair et al. (1996) low fitness, smoking, abnormal electrocardiogram, chronic illness, elevated systolic blood pressure, and increased cholesterol levels are significant independent predictors of all-cause mortality for men, while only smoking and low fitness are independent predictors of all-cause mortality for women. This not only suggests that cardiorespiratory fitness is a more influential predicator of all-cause mortality for women than men (Blair et al., 1996), but also demonstrates the dearth of information that is available concerning morbidity and mortality of women.

The over all mortality rate due to cardiovascular disease (CVD) in the U.S. has been declining over the past decades, but the rate of decline for women is less than that of men (American Heart Association, 1997). This decline in CVD is also less for minority women than for European American women. Health status and physical activity levels of women vary according to factors such as race, socioeconomic status, health behavior, and psychosocial stress (Dishman, Sallis & Orenstein, 1985; Eyler et al., 1997; USDHHS, 1996b). The percentage of adult women who are obese and leading sedentary lives has increased over the past decades, and this has had a negative influence on their health (USDHHS, 1996a). The trend of increased obesity and lack of physical activity increases the risk of CVD mortality and chronic diseases such as type II diabetes and hypertension as these health problems increase as weight increases (Glass, 2000; Kuczmarski et al., 1994).

Research about health benefits of physical activity and predictors and determinants of exercise patterns has focused almost exclusively on white males (Cardinal, 1995; Eyler et al., 1997; USDHHS, 1996a). According to the Surgeon General's report, only 8 of 55 studies concerning CVD and physical activity included women (USDHHS, 1996b). Given the known risks of physical inactivity, the prevalence of women's inactivity, and the dearth of information concerning women, physical activity and health, there is a need to synthesize research specifically related to women and physical activity determinants.

The studies investigating physical activity benefits among women, suggest that physical activity does influence the mortality rate from CVD and general health of women. Kushi et al.(1997) investigated physical activity and mortality in postmenopausal women. They reported a decreased risk of CVD death for individuals engaging in high and moderate levels of regular

physical activity, as compared to those who did not participate in regular physical activity. It is important to note that participants with a history of cancer and cardiovascular disease also had decreased risk of death associated with physical activity. Physical activity is linked with reducing the risk of stroke in women (Hu et al., 2000), lowering the risk of cholecystectomy in women (Leitzmann et al., 1999), and a decrease in fasting insulin levels (Irwin et al., 2000).

The purpose of this paper is to explore the literature on the status of women's health and the benefits of physical activity using Self-Determination Theory (SDT) as an organizing framework, with the goal of outlining an agenda that will guide research efforts. SDT is explored as a framework for synthesizing and interpreting the extant research. The Health Belief Model (HBM), and the Transtheoretical Model (Stages of Change) are included in that framework. The paper concludes with implications and issues for future research. Women's physical activity behaviors are examined through the lens of SDT with the intention of designing theoretically-based intervention programs to increase women's participation in physical activity.

Theoretical Perspectives

Health Belief Model

Over the years as the medical field has evolved, much has been learned about disease processes and the prevention of disease. Human behavior has become the focus of many disease prevention efforts. In the late 1950s, the Health Belief Model (HBM) emerged as a promising theoretical framework from which to better understand and predict the complexity of human behavior in a health prevention context (Janz & Becker, 1984). The earliest application of the model was in the area of primary prevention. Primary prevention of a disease is prevention of the disease before a symptom occurs (Bruess & Richardson, 1995). Later, the model was

applied in both secondary (the treatment of a disease at an early stage to prevent the disease from progressing) and tertiary prevention (disease prevention which lessons or eliminates the seriousness of the effects of a disease such as rehabilitation) efforts.

Description of the model. The HBM is conceptualized as a balance between two elements: the value an individual places on a health goal, such as the desire to avoid an illness, and the belief in the efficacy of a specific personal health action to facilitate the individual's attainment of the health goal, which may be to prevent or reduce symptoms or severity of an illness. The balance between these two elements is driven by the susceptibility and severity that defines the value of a health goal and the benefits of, the barriers to, or the cost that determines the health action taken. These elements as described by Janz and Bekcer are represented in the components listed in Table 1.

Table 1

HBM Components

Component	Description
Perceived susceptibility	An individual's perception of the risk of contracting an illness or belief in a current diagnosis.
Perceived severity	An individual's perception of the consequence or "cost" of an illness both socially and medically, encompassing concerns about treatment verses non-treatment.
Perceived benefits	An individual's perception of the viability of a given health action to prevent or treat an illness.
Perceived barriers	An individual's perception of the negative possibilities or barriers associated with a given health action.

In addition to these components, the HBM recognizes that the presence of an internal or external catalyst triggers cognitive processes involved in considering these components initially.

This catalyst has been referred to as a "cue to action." For example, a cue to action might be a postcard from a health care provider about the availability of the flu shot. Although little research has been directed at this dimension, it is included in the description of the model (Janz & Becker, 1984).

Janz and Becker (1984), in their review of the model's application, concluded the HBM continued to be effective within certain contexts, and identified limitations and shortcomings of the HBM. Specifically, they assert that the model's strength lies within its origin as a framework for primary prevention, such as immunizations and health screenings. Their reasoning was that this type of behavior does not necessarily require a lifestyle change, but rather a one-time health action. The model does not, however, provide information about appropriate interventions when complex health decision-making is required. It is also most applicable under specific conditions. For example, the model assumes that health is valued and that "cues to action" are readily available. In addition, health behaviors that may be influenced by attributes other than attitudes and belief, such as addictive substances or the desire for social approval, are not explained as well by the HBM. According to Janz and Becker (1984), the strongest component of the model is its Perceived Barriers component. Current evidence continues to emphasize the importance of perceived barriers to health actions (Mikhail & Petro-Nustas, 2001).

Applicability of HBM. Since the HBM's development, researchers have proposed additional dimensions for inclusion in the model's constructs to improve its applicability. Rosenstock, Stecher, and Becker (1988) proposed that self-efficacy be integrated into the HBM. Drawing on Bandura's (1986) social learning theory, self-efficacy is defined by Rosenstock et al. (1988) as a situation specific construct describing one's beliefs regarding his or her ability to

behave or perform a skill. Self-efficacy is incorporated into the model to describe the individual's efficacy to perform the skill or behavior required to meet the outcome or health goal. This expansion of the model addresses concerns identified by Janz and Becker (1984), by allowing educators to direct interventions, such as skill training, with more precision than the original version.

Recent studies have employed this extended conceptualization of the HBM (Kloeblen, 1999; Lindsay & Rainey, 1997; Lux & Petosa, 1994; Mikhail & Petro-Nustas, 2001). It is important to note that some researchers are still utilizing the original model as well (Fulton et al., 1991; Wohl & Kane, 1997). The Social Learning Theory expansion of the HBM has also included social norms. This component has been explored in tobacco studies with teenagers to address the influence of peer pressure, media, and other social factors (Lindsay & Rainey, 1997). Some researchers define the expanded HBM as the addition of self-esteem and structural variables such as social-support systems (Minugh, Rice & Young, 1998). It is unclear to what extent the expanded version has been fully evaluated. Janz and Becker (1984) view the addition of self-efficacy to the model as an expansion of the perceived barriers component. Lux and Petosa (1994) tested the version of HBM that included self-efficacy, and found the enhanced model to be useful in the investigation of health behavior change, specifically adolescent HIV risk behavior. They acknowledged, however, inconsistent support of HBM prior to their study due to poorly developed evaluation tools. The inclusion of self-efficacy in the HBM may have improved the applicability of the model, not only because it is an important variable, but also because measurement tools for self-efficacy have been established as valid and reliable.

Measurement. Instruments used to measure the components of the HBM have varied according to the health topic being explored. Some researchers have assessed the components of the model with interview questions (Fulton et al., 1991; Kloeblan, 1999), while other researchers have developed questionnaires based on the model's components using a scale form (Lux & Petosa, 1994; Mikhail & Petro-Nustas, 2001;Wohl & Kane, 1997). Despite the advances in this line of research, the need to develop and standardize tools to measure variables within the HBM cited by Janz and Becker (1984) has not been satisfactorily addressed.

The lack of consistent instrumentation for measurement of variables within the HBM limits its contribution. Further investigation of the expanded model components is needed, as well as the contribution of the cue to action component. The principal contribution of the HBM in describing health behaviors is the perceived barrier component. Awareness of the influential power of perceived barriers in relation to health behavior can inform future investigations to better understand what constrains and or enhances the occurrence of a health behavior.

Transtheoretical Model

Another theoretical model developed to address behavior change is the Transtheoretical model (Prochaska, Redding, Harlow, Rossi & Velicer, 1994). The Transtheoretical model evaluates an individual's readiness to change a behavior (Glanz et al., 1994). This model is often referred to as the "Stages of Change Model" (SCM) in the current literature (Glanz et al., 1994). SCM has been an effective tool in the development of interventions which are population specific based on the measurement of the readiness to change of the population (Velicer, Prochaska, Fava, Norman & Redding, 1998).

Description of the Model. Prochaska et al. (1994) introduced the SCM using the words of Mark Twain, "Habit is habit, and not to be flung out of the window, but coaxed downstairs a step at a time" (p.471). This reference to a one-step-at-a-time approach is a simplification of the concept that is the basis of the SCM. SCM acknowledges that behavioral change requires time and motivation, which in turn activates processes of change that enable individuals to move through stages of change. The stages, presented in Table 2, are considered motivational readiness or intentions to change or modify a behavior.

Table 2

The Stage Continuum[1]

Stage Name	Stage Description (From the Lowest to the Highest Stage)
Precontemplation	not intending to take action, often measured as the next 6 months
Contemplation	intending to change within 6 months
Preparation	intending to take action, often measured as the next month
Action	overtly making changes within the last 6 months
Maintenance	taking steps to sustain change and resist relapse

The catalysts for movement from one stage to the next are the processes of change. Processes of change are activities in which people engage that enable them to move from one stage to another stage (Velicer et al., 1998). The processes of change were identified from a large range of possible processes as the 10 most commonly replicated and empirically supported processes involved in movement from one stage to another (Prochaska et al., 1994). The process

[1] From "The Transtheoretical Model of Change and HIV Prevention: A Review"' by J. O. Prochaska, C. A. Redding, L.L. Harlow, J.S. Rossi, and W. F. Velicer, 1994, Health Education Quarterly, 21, p. 473. Copyright 1994 by Society of Public Health Educators. Adapted with permission of the author.

constructs are defined in Table 3, while Table 4 provides a schema of the way stage constructs are mediated by the processes, presented on the following pages.

A key construct that extends the perceived barriers construct from the HBM has been integrated into the Transtheoretical model of change as the Decisional Balance scale (Velicer et al., 1998). The Decisional Balance scale, an outcome measure of the SCM, refers to an individual's comparative action, weighing the pros and cons of making a behavior change. SCM, via the decisional balance scale, ventures beyond the single decision model represented in

Table 3

Definitions of the Processes[2]

Process	Definition
Consciousness raising	Increasing level of awareness and more accurate information
Dramatic relief	Experiencing and releasing feelings
Environmental reevaluation	Affective and cognitive re-experiencing of one's environment and problems
Self-reevaluation	Affective cognitive re-experiencing of one's self and problems
Social liberation	Noticing social changes that support personal changes
Self-liberation	Belief in one's ability to change and commitment to act on that belief
Counter-conditioning	Substituting more positive behaviors and experiences for problem ones
Helping relationships	A relationship involving openness, caring, trust, genuineness, and empathy
Reinforcement management	Reinforcing more positive behaviors and punishing negative ones
Stimulus control	Restructuring one's environment or experience to reduce the likely hood of problem stimuli occurring

[2] From "The Transtheoretical Model of Change and HIV Prevention: A Review"' by J. O. Prochaska, C. A. Redding, L.L. Harlow, J.S. Rossi, and W. F. Velicer, 1994, Health Education Quarterly, 21, p. 477. Copyright 1994 by Society of Public Health Educators. Adapted with permission of the author.

primary prevention in the HBM, and allows for a more complex interpretation of how people change a health behavior. Self-efficacy has also been integrated into the SCM, using the Temptation scale (Velicer et al., 1998) that assesses the situational specific belief that an individual can cope with a high-risk situation without reverting to the old health behavior she or he is trying to change to stop. Marcus, Selby, Niaura and Rossi (1992) incorporated self-efficacy into the SCM in an exercise setting, concluding that the inclusion of an individual's perceived confidence to exercise would enhance the model.

Table 4

Processes of Change that Mediate Progression between the Stages of Change[3]

Precontemplation	Contemplation	Preparation	Action	Maintenance
Consciousness raising ----------				
Dramatic relief----------				
Environmental reevaluation----------				
---------- Self-reevaluation----------				
--------- Social Liberation----------				
---------- Self-liberation----------				
----------Counter-conditioning-----				
---------Helping relationships----------				
---Reinforcement management--				
Stimulus control				

Applicability of SCM. The SCM has been employed successfully in several different contexts of health behavior studies ranging from HIV prevention to nutritional intervention

[3] Processes are not confined to an individual stage, hence the scattered placement. Processes to the left are referred to as experimental processes and those further to right are referred to as behavioral processes. From "The Transtheoretical Model of Change and HIV Prevention: A Review"' by J. O. Prochaska, C. A. Redding, L.L. Harlow, J.S. Rossi, and W. F. Velicer, 1994, Health Education Quarterly, 21, p. 478. Copyright 1994 by Society of Public Health Educators. Adapted with permission of the author.

(DiClemente, Bellino, & Neavins, 1999; Finckenor & Byrd-Bredbenner, 2000; Glanz et al., 1994; O'Conner, 1994; Prochaska et al., 1994). Specifically in the context of exercise behavior, Marcus and Simkin (1993) found the SCM to be useful in differentiating the levels of physical activity behaviors. Cardinal (1995) investigated exercise behavior in female adults and also found the stages of change to be differentiated. The strength of the model allows health educators to match an appropriate intervention to the individuals' stage of readiness (Finckenor & Byrd-Bredbenner, 2000; Orleans, 2000).

Measurement. The key to measurement within the SCM is the researcher's ability to adequately establish the criteria that correspond to the given stage. The ability of the researcher to accurately establish these criteria could limit the model's strength (Prochaska et al., 1994). Also confounding this is the absence of measurement tools to assess the processes. The time table established by the model may be limiting as well, although the parameter of time involved in each stage description has been stable from study to study (Finckenor & Byrd-Bredbenner, 2000; Stach, Annan, Tilliss, Astroth & Cross-Poline, 2000). Specifically, the time frame of six months associated with the stages may not be applicable for some individual experiences (Orleans, 2000; Rothman, 2000).

In the context of exercise, two scales to measure exercise stages of change have been developed, each validated through self-report comparison (Cardinal, 1995; Dannecker, Hausenblas, Connaughton, Lovins & Loving, 2000; Marcus & Simkin, 1993). The model has been used to guide interventions but the effectiveness of the interventions have not been evaluated.

Parallels between HBM and SCM

Measurement of the SCM, like the HBM, has varied with the context or behavior investigated, and the issue of accurate measurement has been a concern in research studies using both frameworks. At their inceptions, both models were initially based on what might be analogous to a behaviorist approach, where an appropriate stimulus would be predicted to elicit the desired response. As these models evolved, however, it became apparent that a stimulus-response approach did not encompass the complex nature of behavioral change. Extensions of those models began to incorporate social cognitive variables such as self-efficacy, acknowledging the powerful influence of cognition and motivation in the decision making process. The major contribution of the HBM has been identified as the recognition of the importance of perceived barriers in engendering behavior change. The SCM provides a framework to assist in the categorizing of those barriers according to different stages, while identifying processes along the continuum of stages that are likely to facilitate progression through the stages. In some ways, the SCM extends the HBM by addressing the issue of maintenance, which is the end goal in the SCM. Neither of these models, however, has investigated constructs or variables that are influential in the maintenance of target behaviors.

Self-Determination Theory

Research conducted using both the HBM and SCM has made a contribution to the knowledge base relative to changing health behavior. A consistent theme that has emerged from both of these lines of research is that understanding an individual's cognitions, especially those cognitions that are related to motivation, is at the center of understanding how to facilitate long term behavior change. Motivation as defined by Roberts (1992) as the initiation and

maintenance of goal directed behavior. It is important to note that motivation is not merely beginning to engage in a behavior; rather, this cognitive process encompasses engaging in the goal directed behavior of a long period of time under individual volition. Self-determination theory (SDT), conceptualized by Deci and Ryan (1985), provides a framework that encompasses the contributions of the HBM and SCM models while affording the opportunity to further our understanding of how individuals can be encouraged to make decisions that will have a positive effect on their long-term health.

Description of the Model. SDT is a theory of motivation and behavioral regulation that focuses on internalization and personality orientations within a social context (Rose, Markland & Parfitt, 2001). Internalization is the process by which motivation for a behavior moves from more external regulation to more internal regulation (Deci, Eghrari, Patrick & Leone, 1994). Personal interpretation of a situation is personality orientation specific (Rose et al., 2001). Personality orientations are individual differences that describe the extent to which people choose to be autonomous, controlled or a part of the regulation of their behavior. Three orientations, referred to as causality orientations, have been identified: a) autonomy, b) control, and c) impersonal. An autonomy-oriented individual seeks situations to express self-determining behavior and interpret situations as information from which to regulate chosen behaviors. Control-oriented individuals rely on internally imposed or external events to regulate their behavior. An external event may be a reward or deadline. The impersonal-oriented individual believes that behavior outcome is uncontrollable and feels a sense of helplessness.

According to the SDT, the social context or climate mediates the amount and quality of internalization. An individual's social context may either be supportive and understanding,

allowing for choices which would facilitate internalization of autonomy, versus a controlling non-supportive social context that would not facilitate autonomous motivation (Williams, Grow, Freedman, Ryan & Deci, 1996). The view of motivation as a continuum from amotivation (lack of motivation), to extrinsic motivation (externally controlled motivation), to intrinsic motivation (for the activity itself) is an important construct that underlies SDT (Biddle, 1999). A hierarchical view of motivation (Vallerand, 1997), in which intrinsic motivation is the highest and most desirable form, is consistent with current social cognitive theories that view perceptions of control as the underlying thread that links all theories of motivation (Biddle, 1999).

SDT is based on three assumptions: (a) individuals are considered proactive; (b) individuals are considered to be naturally prone toward growth and improvement; and (c) individuals have basic psychological needs that are innate, universal, and essential for health and well being (Deci & Ryan, 2000). Autonomy, competence, and relatededness are identified as nutriments that are necessary to satisfy these psychological needs, and they are the fuel for an individual's endeavor to internalize or integrate one's actions and experiences into self within a social environment (Deci et al., 1994).

Autonomy is the degree to which people choose actions at the highest level of consideration and initiate the actions with a full sense of choice (Strauss & Ryan, 1987). Controlledness, the degree to which one feels pressure from entities other than self, is on the opposite end of the continuum from autonomy. Guilt is one example of pressure originating from external sources that is considered to be controlling. It is proposed that autonomous actions are more flexible and creative in nature than controlled actions. In goal setting research, for

example, an autonomous goal would more likely be attained than would a controlled goal due to the lack of choice involved in the controlled goal (Ryan & Deci, 2001; Sheldon & Elliot, 1998). An autonomous goal is one chosen by the individual that evokes a sense of ownership. In contrast, a controlled goal is one that is given to the individual from an external source such as an authority figure or one that is derived from internal pressure, such as beliefs of what an individual should do.

The competence nutriment is based on an individual's experiences and beliefs that he or she can produce a desired outcome (Ferrer-Caja & Weiss, 2000; Reis, Sheldon, Gable, Roscoe & Ryan, 2000). Markland (1999) defines competence as the perceptions of ability in negotiating the social context. SDT suggests that when personal trials are perceived as self-determined, i.e. autonomous, then perceived competence will be influenced, and motivation will likely become more internalized .

Relatedness refers to individuals' feelings of closeness to other people. Relatedness is considered to be bi-directional, in that one not only seeks to give or care for, but also to receive or be cared for. The quality of relationships with others, feeling understood, participating in meaningful dialogue, and having fun with others are all components of relatedness (Ryan & Deci, 2001). A given social context may provide relationships that vary in the amount of supportiveness for the internalization of a behavior and thus facilitate the behavior, becoming more internally regulated (Rigby, Deci, Patrick & Ryan, 1992). Relatedness depends in part on finding personal value in everyday activities, and is associated with the emotional well being of an individual (Reis et al., 2000).

Given these assumptions, SDT proposes that the process of integration can explain behavior regulation and motivation. The level of volition will reflect the level of internalization or integration per the behavior. When an action is fully integrated or internalized, the person identifies with the value of the action and accepts ownership for it. The action is then considered self-determined or under self-control (Deci et al., 1994).

An illustration of the continuum of self-determination or internalization that guides motivation and behavior regulation from amotivation to intrinsic motivation, adapted from Biddle (1999), is presented in Table 5, on the following pages.

Amotivation is a term used to describe little or no motivation in attempting a behavior. There are four types or levels of extrinsic motivation. Each type of extrinsic motivation possesses a different degree of internalization as the continuum moves to the right of the table toward intrinsic motivation. The lowest level of external regulation is referred to as simply external regulation and might be illustrated by the comment: "OK, I'll go to the exercise class if I really must." This type of regulation is controlled by rewards or threats, such as coercion or pressure from a supervisor or person of authority to an individual.

Introjected regulation is the next level of external motivation moving toward self-determination. Introjected regulation is illustrated by the statement: "I feel guilty if I don't exercise regularly." Introjection describes a partial or less than optimal level of internalization that results in a degree of internally controlled behavior regulation. When a person is acting from an introjected internalization, the person values the action but does not accept ownership. Guilt or promises of external rewards internally control an action that is introjectedly internalized.

Identified regulation is represented by the statement: "I must exercise to look better." This approaches self-determined motivation, and is sometimes referred to as the threshold of autonomy. The action is motivated by the outcome of participation in an activity, such as disease prevention or fitness improvement. The focus of identified regulation is on a product or an outcome. An important point to express about the continuum is that extrinsically motivated behaviors may have varying degrees of self-determination, providing the basis on the continuum (Rigby et al., 1992).

Integrated regulation is considered the most self-determined form of behavior regulation. Integrated regulation is reflected in the statement: "I exercise because it is important to me, and it symbolizes who I am." The behavior becomes fully integrated into one's identity, and is important in relation to personal goals. Integration describes an optimal level of internalization that results in self-determined behavior regulation. Integration is predicted to occur in social contexts that support autonomy, whereas introjection is more likely to occur in non-autonomous supportive environments (Deci et al.,1994). Integrated regulation is not, however, intrinsic because it is not engagement for the pure enjoyment of the activity.

The highest level on the continuum of behavioral regulation is intrinsic motivation, when the individual participates in the action for enjoyment and for the action itself (Ryan, Fredrick, Lepes, Rubio & Sheldon, 1997). As individuals move closer to intrinsic motivation, they possess stronger feelings of personal investment, autonomy, and self-identity. Truly intrinsic motivation occurs when the activity is valued as an end in itself and is operationalized in three forms: (a) to know, (b) to accomplish, (c) to experience stimulation.

Table 5

Internalization Continuum[4]

Behavior Regulation					
	Extrinsic Motivation				
Amotivation	External regulation	Introjected regulation "ought"	Identified regulation "want to"	Integrated regulation	Intrinsic motivation
Helplessness beliefs	Rewards and Threats	Avoiding guilt, pleasing others	Begin to act out of choice	Values the activity, begins to identify with self	Values the activity itself
» Self-Determination °					

Every situation may be experienced as informational, controlling or amotivating, and the manner in which the situation is perceived is predicted to affect intrinsic motivation. Cognitive evaluation theory (CET) (Deci & Ryan, 1985), a mini-theory within SDT, provides a framework for interpreting the mechanism that operates within various situations and the way that variables within those settings are perceived. CET recognizes that, based on personal and situational variables, the same situation may be perceived differently by different individuals. A situation that is interpreted as informational is predicted to increase intrinsic motivation by providing information about competence. When situations are perceived as controlling, for example when

[4]From "Motivation and perceptions of control: Tracing its development and plotting its future in exercise and sport psychology," by S. Biddle, 1999, Journal of Sport and Exercise Psychology, 21, p.1. Copyright 1999 by Human Kinetics Publishers, Inc. Adapted with permission of the author.

an individual feels he or she is being pressured or coerced, it is predicted that intrinsic motivation will decrease. The pressure or coercion may or may not lead to the achievement of specific outcomes, but is likely to lead to a decrease in internalization. When individuals believe that their actions will not have an effect on the desired outcome, amotivation is predicted, promoting a pattern of learned helplessness. This proposed continuum has been investigated and supported within different domains; hence the degree of internalization equals the degree of autonomy (Ryan & Connell, 1989).

Application of SDT. Investigators studying motivation, physical activity and health behaviors have used SDT as a framework to identify and assess promising intervention strategies. SDT has been applied in investigating health domains such as addictive behaviors, medication adherence, anorexia, weight loss, medical education and exercise. The choice fullness or autonomy of a behavior change, together with the autonomous support provided by health educators and health care providers, is salient to the internalization process of self-regulation (Ryan, Plant, & O'Malley, 1995; Struass & Ryan, 1987; Williams, Cox, Kouides & Deci, 1999; Williams, Freedman, & Deci, 1998; Williams et al., 1996; Williams, Rodin, Ryan, Grolnick & Deci, 1998). In an exercise setting, for example, levels of self-determination have been shown to influence women's perceived competence, and ultimately intrinsic motivation (Markland, 1999). This line of investigation has generated an impressive body of evidence that SDT has the potential to provide insight into the individual needs of female exercise participants in facilitating exercise adherence, based on conclusions from health behavior investigations (Ryan et al., 1997). Generally, these studies have relied on structural equation modeling to investigate how a variety of variables measured in interventions impact achieving

and maintaining a targeted behavior. Ryan et al. (1995) investigated effectiveness of alcohol treatment by examining trends in patient characteristics. In relation to internal versus external motivation, external motivation is characterized by demands or control from others, or an outside of self source. Levels of internalized motivation on the self-determination continuum were measured by reflecting on introjected and identified types of motivation. Introjected and identified motivations are somewhat less external, but not fully self-determined. Introjection is described as action based on approval of others in order to maintain self or avoid anxiety and guilt. Identification represents action based on personal values and commitments. Internalized motivation for treatment was associated with greater program participation and retention. Variations in participant internalized and external motivation predicted program treatment response. Positive responses were associated with even and low levels of internalized motivation, regardless of the level of external motivation.

Smoking cessation and prevention programs have been explored utilizing SDT. Williams et al. (1999) employed two different presentation style interventions with adolescents, one based on fear and demand and the other based on choice. Perception of a high level of autonomous support from the presenters by presenting the intervention based on choice was positively correlated with autonomous reasons for not smoking. Autonomous reasons for not smoking, in turn, led to a decrease in self-report of smoking among program participants four months later. The use of SDT was supported in presentation style of delivering health-related information, and ultimately, delivering health information in an autonomous manner became as important as the information itself.

Williams, Gagné, Ryan and Deci (in press) reported similar findings in a physician-led smoking cessation program for adults. Autonomous motivation for smoking cessation predicted abstinence. Perceived competence was incorporated in this study and predicted cessation, but only for short periods of time. In contrast to the strength of the delivery method examined in the adolescent study, styles of autonomous vs. controlling presentations in the delivery of information did not affect cessation rates, even though the two styles were reliably distinguishable. However, relative to the participants perceiving the physician as one who provided autonomous support, the participant autonomous motivation report for smoking cessation became higher. These findings showed that interventions emphasizing participant autonomy make a strong impact toward individual improvement in behavioral change, showing great promise.

SDT has also been employed as a framework to investigate adherence to medical treatment. Williams and Deci (1998) investigated adherence to medical treatment and found autonomous motivation was strongly related to long-term medication adherence. Perceived barriers, defined as perceptions individuals have concerning possible obstacles to adherence, also influenced adherence. As the number of perceived barriers increased, adherence was less likely. A regression analysis revealed, however, that autonomy mediated the relationship between perceived barriers and adherence. Persons who were more autonomous were inclined to perceive fewer barriers to adherence. Furthermore, individuals who indicated they received autonomous support from their physicians perceived fewer barriers to adherence.

Williams, Freedman and Deci (1998) continued this line of research by investigating the applicability of SDT nutriments with diabetic patients. Over a one-year period and on three

separate occasions, participants completed questionnaires and had their blood sugar checked. Questionnaires were employed to assess (1) autonomous versus controlled reasons for adhering to medical treatment of their diabetes; (2) feelings of competence in adhering to medical treatment; and (3) individual perceptions of the medical staff's autonomy supportiveness. Patients who felt supported in autonomous ways from health care providers tended to feel more competent about their treatment adherence. Autonomous motivation tends to predict positive health behaviors, in which individuals take ownership of their well-being. Participants in this study ranged in age from 18 to 80 years. The consideration of SDT nutriments as being universal is supported by a diverse range of participant ages, in this investigation as well as other health behavior-related investigations.

SDT has been utilized not only to examine autonomously supportive interventions, but also to investigate who is more likely to respond to health behavior change interventions. Williams et al. (1996) investigated the program staff's autonomous support and participants' autonomous orientations as measured by personality orientation in a weight loss program. The level of participants' autonomous personality orientation predicted the autonomous motivation or reasons for participation in the program. The supportiveness of the social context or climate, together with the autonomy of the participants' motivation, affected both short and long-term weight loss attributed to program adherence.

Strauss and Ryan (1987) investigated levels of autonomous personality orientation in subtypes of Anorexia Nervosa patients. The purpose of this study was to determine whether control groups differed from subtype anorexia groups, based on personality orientations. Subtypes included were restrictors and bulimic anorexics, in addition to a control group.

Subtypes were differentiated by impersonal causality to some degree. The researchers concluded that different subtypes of Anorexia Nervosa patients have different autonomy-related issues or disturbances, supporting the concept that personality orientations could be influential factors with regard to eating disorders.

Medical education has been investigated within the SDT framework, since it is common for individuals to receive health information and interventions from health care providers; this observation suggests a link between the autonomous support presented by health care providers, and the health behavior outcome of individuals receiving that information. Williams and Deci (1998) contend that although theories such as self-efficacy provide evidence for motivation of health behaviors, those theories do not address the type of motivation. Using SDT as a framework, they argue that if the support given by the health care provider is autonomous in nature, the accompanying increase in autonomous motivation will positively affect not only the initiation, but also the maintenance of a health behavior. Evidence from the medical school curriculum level was consistent with earlier findings from smoking cessation studies: the presentation style of medical school education influenced the autonomous support perceptions of medical students. Hence, the medical student experienced a more humanistic approach to providing care due to the presentation style of his or her educators. Evidence suggests that this teaching method or presentation style may influence a student's treatment style with patients in the future through autonomous support to patients (Williams & Deci, 1996).

In the specific domain of exercise and physical activity, the application of SDT has produced a better understanding of how a physical activity program participant's initial level of motivation predicts program adherence. In a study by Oman and McAuley (1993), exercise

participants who entered a program with high levels of intrinsic motivation and who sought social interaction (relatedness) had increased exercise program attendance as compared to participants with lower levels of intrinsic motivation. Similarly, investigation of initial motivation for participation in physical activity indicated physical activity program attendance and adherence was related to more intrinsic motives of competence and enjoyment than to extrinsic motives such as body-related reasons for participation (Ryan et al., 1997).

Activity types, either sport or fitness related, have also been found to differ as a function of the level of intrinsic motivation and ultimately differed in participation. Fredrick and Ryan (1993) reported that persons engaged in sport related activities were more intrinsically motivated and had greater perceived competence than individuals engaged in fitness activities whose focus was less on enjoyment and more on body-related concerns. Even among individuals participating in physical activity, extrinsic and intrinsic motivation can be differentiated. Markland (1999) investigated the effects of perceived competence on self-determination in an exercise setting and found that participants with high levels of self-determination were not influenced by perceived competence while participants low in self-determination and perceived competence were less likely to participate.

Recently in the context of high school physical education classes, Ferrer-Caja and Weiss (2000) generated a model based on CET (Deci & Ryan, 1985) and achievement goal theory (Ames, 1992; Nicholls, 1989) and tested relationships among individual and social factors, intrinsic motivation, and motivated behavior. They assessed self-determination, perceived competence, intrinsic motivation, goal orientations, perceived motivational climate, and teaching style. Measures of effort and persistence were based on teachers' ratings. The findings provided

partial support for CET, as perceived competence was moderately related to intrinsic motivation, but the relationship between self-determinations and intrinsic motivation was weak. The authors suggested that this could have been attributable to an overall limitation in the design of the study, in that all students were required to take the course, inherently limiting the potential for self-determination, as students might not have perceived that they had any choice to participate. Higher levels of intrinsic motivation, effort and persistence in class were related to perceptions of a mastery-oriented learning climate and perceived competence. Interpreting these results using CET, Ferrer-Caja and Weiss recommended that teachers emphasize learning processes rather than outcomes, foster participation rather than competition, and emphasize effort and improvement to facilitate intrinsic motivation.

Measurement. In health behavior and exercise domains, questionnaires have been validated to assess constructs defined by SDT. For example, Deci and Ryan's (1985) causality orientations scale (GCOS) assesses one's autonomy, control and impersonal orientations, and is considered a global measure of personality orientation. Rose et al. (2001) developed the Exercise Causality Orientations Scale (ECOS) to assess the strength of individuals' causality orientations in the exercise domain. The Perceived Competence Scale (PCS) has a smoking cessation version (Williams et al., in press), and an adherence to the diabetes treatment version referred to as the Perceived Competence for Diabetes Scale (PCDS) (Williams, Freedman et al., 1998).

Health Behavior Among Women

In order to use SDT as a framework to interpret women's physical activity behavior, it is important to review the available literature about characteristics of women who do and do not

exercise, and the effectiveness of various intervention programs using SDT as a lens to interpret the findings. Descriptive demographics of women who do or do not practice positive health behaviors vary according to age, education level, race and socioeconomic status (SES) [Centers for Disease Control (CDC), 1995; Felton, Parsons, Misener, & Oldaker, 1997; Ford et al., 1991]. For example, younger women tend to participate in physical activity more than older women, as do more educated women than do less educated women. Lower SES is usually predictive of poorer eating habits and sought medical care in contrast to women of higher SES. As women age, they tend not only to change their types of physical activity, but also their incentives for participation in physical activity (CDC, 1995; Gill & Overdorf, 1994). Younger women participate in physical activity for appearance concerns, while older women participate in physical activity for health concerns.

When the educational level of women and leisure time physical activity are investigated, education level seems to be an extension of the demographic SES (CDC, 1995). The influence of SES and race, however, remains unclear (Felton et al., 1997; Ford, Ahluwalia & Galuska, 2000; Vandervoort, Divers, & Acojido, 2000). For example, the 1996 and 1998 leisure time physical activity (LTPA) data from the Behavioral Risk Factor Surveillance System (BRFSS) for the State of Michigan indicated educational level and SES predicted participation in walking, but race was not a factor. It was suggested, however, that race should still be considered as a marker for other risk factors related to LTPA (CDC, 1995)

Other studies have suggested that race and SES interact in complex ways. Ford et al., (1991) sampling both upper and lower SES levels, found that race fell closely within the SES divisions. That is, most upper SES were European American and most lower SES were African

American in both males and females. Lower SES women, most of whom were African American, were the least active group. Vandervoort et al. (2000) investigated self-reported health problems and found multiracial subgroups to be more likely than individuals of the Asian and Caucasian race to have health problems. Controlling for SES by pairing participants on body mass index (BMI) and SES, Felton et al. (1997) investigated health-promoting behaviors such as exercise, nutrition, and stress management of African American and European American college women. Even when BMI and SES were controlled, European American students reported a higher level of health promoting behaviors than African American students. This suggests that cultural influences associated with race are not simply a function of SES.

Taken together, the demographic studies of women's participation in physical activity that are presently available do not provide us with a clear picture of who exercises, and why they exercise. The relationship between SES, race and physical activity is not understood, and further investigation of the influence of socio-cultural factors on health behaviors is needed, especially among minority women by race and SES (Felton et al., 1997; Ford et al., 2000; CDC, 1995; Vandervoort et al., 2000).

Barriers to and Facilitators of Health Behaviors Among Women

Exploring related health promotion and/or disease prevention behaviors has the potential to direct interventions designed to increase levels of physical activity in women. To design effective interventions, it is important to examine the facilitators and barriers that women perceive as they contemplate engaging in physical activity. Negotiation of perceived barriers is a key to facilitating positive behavioral change, and SDT provides a framework that sheds light on how that may be accomplished.

Knowledge. Beliefs, knowledge and attitudes women have about their health doubtlessly influence their behavior, as illustrated in previous research conducted within the HBM (Janz & Becker, 1984). For example, knowledge positively influenced the dietary quality of 50-75 year old women, demonstrating that lack of knowledge can be a barrier to positive health behaviors among women (Lahmann & Kumanyika, 1999). Given the relationship between beliefs, knowledge, attitudes and behavior, consider the following research findings:

1. When men and women were asked about the control they perceived over the same disease, women reported having little or no control over the same diseases they felt men had control over (Benrud & Reddy, 1998).

2. Canadian women identified diet as an uncontrollable risk factor to CVD along with family history (Naimark, Tate, & Turner, 1999).

3. Women, ages 40-95, more accurately identified mortality risk for men than for themselves. Older women were less informed about health risks associated with CVD and various cancers than younger women. Participants in this study did perceive women to be at risk and in control of heart disease but rated themselves to be at a lower risk than other women (Wilcox & Stefanick, 1999).

These findings demonstrate women have a lack of knowledge and perceived sense of control over their own health. Using a HBM framework, it is suggested that providing knowledge as a cue to action should generate a health goal, together with an accompanying action to meet that goal. Using SDT helps us understand that knowledge alone is unlikely to change behavior. The process of internalizing that knowledge is seen as an essential element in

the initiation and maintenance of long-term behavioral change, and a sense of autonomy is a key component or nutriment.

Self-efficacy. Self-efficacy is an individual's perception of her or his ability to carry out a given task (Bandura, 1986). In a summary of the literature related to determinants of physical activity, self-efficacy was identified as key element in predicting adherence to an exercise program (King et al., 1992). For women specifically, self-efficacy has been identified as a necessary interpersonal characteristic associated with success in weight-management programs (Senekal, Albertse, Momberg, Groenewald & Visser, 1999). Self-efficacy caused differentiation between exercise program adherers and dropouts, both at the onset of beginning a program and after completion (Dawson & Brawley, 2000; Garcia & King, 1991). It has been utilized as a supplementary component to enhance the applicability and predictive ability of both the HBM and TM (Rosenstock et al., 1988; Velicer et al., 1998). For example, self-efficacy was higher among participants who exercised regularly (Action stage) than those who had not yet started to exercise (Contemplation and Precontemplation stages) (Marcus et al., 1992).

Self-efficacy appears in the SDT as a key component in the process of internalizing motivation as a central element in all three nutriments: autonomy, relatedness, and competence. The perception of control, competence, and self-worth are central to the process of enhancing self-efficacy that has been identified as a powerful facilitator in intervention programs.

Social Roles and Relationships. Another prevalent barrier to positive health behaviors among women seems to be their perception and internalization of their social roles and personal relationships, such as employee, motherhood, spouse, and housewife (Dattilo, Dattilo, Samdahl & Kleiber, 1994; Henderson & Ainsworth, 2000; Kirk & Gillespe, 1990; Verhoef & Love, 1992;

1994). This has been reported in studies including women from different nationalities, implying a sort of universal role influence on women's health (Al Ma'aitah, Haddad & Umlauf, 1999; Coleman, Antonucci, Adelman & Crohan, 1987; Devine & Sandstrom, 1996; King et al., 2000).

When time is perceived as a barrier, it is consistently paired with the care taking roles mentioned above as an interconnected barrier to physical activity for women (Johnson, Corrigan, Dubbert & Grambling, 1990; Shaw, 1994; Verhoef & Love, 1994). Interestingly, however, is the understanding that as one may find a role to be a barrier to physical activity, the internalization of that same role may facilitate physical activity. This is evident in age-related investigations indicating that women not only interpret roles differently, but also that their perceptions and negotiation of roles are ever changing (Johnson et al., 1990; Verhoef & Love, 1994). For example, as a woman's life experiences evolve over time, so may her roles and the obligations of those roles.

A parent of a young child has different demands than a grandmother with a grandchild. A woman's perception of role overload implies a perception of too much to do in too little time. Evidence suggests that role overload is negatively related to women's exercise participation. Therefore, parenthood is considered a life-long role over time, and depending on various factors such as SES, marital, and employment status changes.

The nutriments of SDT, autonomy, competence, and relatedness illustrate how this theory can be used to understand how social roles and relationships function as barriers to physical activity. When women perceive a lack of control or autonomy associated with those roles and relationships, a lack of competence to fulfill them, or a lack of relatedness from them, it is unlikely that they will be able to internalize motivation to engage in physical activity.

Perceived Social Support. Baum and Posluszny (1999) identify the lack of social support as a crucial barrier to positive health behaviors. This barrier also seems to evolve as women age (Gill & Overdorf, 1994). Hence with age, as roles and relationships change, the quality of women's relationships becomes important to participation in health behaviors (Ford et al., 2000; Vandervoort, 1999). Lack of perceived social support from one's home environment, physician relationship, and/or program instructor has been negatively associated with health behavior change (Devin & Sanstrom, 1996; Henderson & Ainsworth, 2000; King et al, 2000; Martin et al., 1984; Martin & Dubbert, 1982). Again, SDT provides a framework that addresses this barrier, as the relatedness nutriment is central in the process of internalizing motivation.

Negotiating Barriers. In a recent study, Solmon, Munro, Autrey, and Landry (2002) investigated barriers to and facilitators of physical activity for mid-life women, using a qualitative approach. Using SDT as a framework, their analysis revealed that the same factors which constituted barriers for some women to engage in physical activity were successfully negotiated by others to become facilitators. For example, family responsibilities were cited by some women as barriers that made it difficult or impossible for them to take the time to exercise. Others, however, were able through autonomous support, perceived competence, and relatedness, to negotiate this barrier and reframe those responsibilities to become facilitators. Specifically, they were able to incorporate physical activity into their role of caretaker.

Developing Interventions. The task of developing successful interventions for behavior change in women has been successful, despite what may seem to be too complex an approach (Dunn et al., 1999; Eakin, Glasgow & Riley, 2000; Keyserling, Ammerman, Ainsworth & Samuel-Hodge, 2000). The element in health behavior change interventions for women,

emerging as the dominant factor, is the degree to which the intervention is multidimensional, flexible, and thus tailored to fit the kaleidoscope of women's unique situations (Brownell, Stunkard, & Albaum, 1980; Devine & Sandstrom, 1996; Dunn et al., 1999; Gates & McDonald, 1997; Gill & Overdorf, 1994; King et al., 2000 ; Martin, et al, 1984; Senekal et al., 1999).

Dunn et al. (1999) employed two interventions over a 24-month period to increase physical activity and cardiorespiratory fitness. The lifestyle intervention emphasized integrating an accumulation of moderate-intensity physical activity into daily activity. In contrast, the structured intervention required regularly scheduled participation in an aerobic exercise class held at a fitness center. They predicted that the lifestyle approach would allow participants to overcome activity barriers such as transportation or time. The lifestyle approach was more effective over time, as compared to the traditional structure approach in increasing physical activity.

Marcus and Stanton (1993) suggest intervention investigations should include a follow-up for both adherers and non-adherers. When relapse prevention and reinforcement interventions designed to encourage exercise adherence were investigated, increases in the number of sessions did not increase adherence, although there was a difference between the control and all levels of treatment. Marcus and Stanton (1993) suggest the take-home message of this investigation is that a comprehensive follow up with all participants may provide a better understanding of the participants' experiences through behavior change. Measurement tools developed to assess the constructs of SDT may be helpful in assessing the participants' perceptions of the intervention versus the traditional method of counting the number of adherers versus non-adherers.

A literature review completed by Simons-Morton, Mullen, Mains, Tabak and Greeen (1992) suggests that adhering to educational principles enhances the success of interventions for health behavior change. They reviewed interventions in clinical patient education, as well as counseling, based for behavior change to prevent disease. The educational principles identified included: relevance, individualization, feedback, reinforcement and facilitation. Relevance refers to the appropriateness of the content of material utilized. Individualization is the amount to which the needs and desires of the patient are taken into consideration when designing the intervention. Feedback is described as information pertaining to the patients' progress. Reinforcement is the encouragement the patient receives from the health care provider. Facilitation refers to the material provided to the patient to help them succeed in making a behavior change.

Constructs of SDT seem to underlie these educational principles. For example, individualization is characterized much like autonomous support. Allowing the patient to feel a part of the intervention design creates an individualized intervention in which the patient can perceive ownership. Feedback and reinforcement principles relate to perceived competence. If one receives feedback and reinforcement that provides information about one's progress and how to improve, then SDT predicts perceived competence will increase.

The interrelationships between each barrier to and facilitator of health behavior change, including those applicable to increasing physical activity, must be considered with regard to the individual for successful change intervention. These implications, listed above, lay the groundwork for utilizing SDT as an organizing framework to future investigations of women's physical activity behavior. While the SCM model recognizes the necessity of tailoring

interventions to individual needs based on the stage of readiness, SDT theory provides a framework from which to tailor the interventions based on internalizing motivation via the nutriments.

Issues for Extending Research

Although there is evidence that women are less active than men (USDHHS, 1996b), we have little specific information concerning women's activity levels, and the reasons that they chose to be active. More research is needed to address the physical activity status of women in general, as well as specific subgroups--such as older women and minority populations--as those groups are generally classified as the least active. Assessment of women of minority populations may provide an understanding of cultural influences of physical activity (Ford et al., 1991; Vandervoort et al., 2000). Another issue that needs to be addressed in future studies is the investigation of relapse prevention and maintenance interventions (Marcus et al., 2000; Martin et al., 1984; Rothman, 2000).

There seems to be a lack of congruency between the definition of health enhancing physical activity and leisure activity for the previously inactive and otherwise healthy adult. This discrepancy among health promotion professionals, which may be confusing to women, may also confound the interpretation of outcome measures of research based on women's understanding of what constitutes physical activity (Eyler et al., 1997; Henderson & Ainsworth, 2000).

The primary sources of information in regard to women's physical activity rely heavily on databases generated by large-scale surveys. Although that demographic information provides us with a broad overview of issues regarding women and physical activity, this approach does

not provide a thorough understanding of the decisions that women make with regard to engaging in physical activity. Recent studies (Henderson & Ainsworth, 2000; Solmon et al., 2002) have begun to use qualitative techniques to investigate factors that facilitate women's adoption of healthy, active styles, and perceived barriers that hinder such adoption.

Applying SDT to Physical Activity Behavior of Women

The application of SDT for the study of women's physical activity has the potential to extend our understanding of the complex interaction of factors that affect women's physical activity. Examples of how SDT may be used include:

1. Examination of how roles influence perceptions of autonomy concerning participation in physical activity, given differences in SES, race and age determinants of positive health behaviors (Coleman et al., 1987; Felton et al., 1997; Ford et al., 2000; Gill & Overdorf, 1994; King et al., 2000; Vandervoort et al., 2000; Verhoef & Love, 1994).

2. Examination of the commonalties and differences between physically active and inactive individuals in healthy populations may provide a better understanding of how an individual's unique life experiences shape behavior, such as perceptions of role obligations (D'Elio, Ness, Matthews & Kuller, 1997).

3. Examination of how social support is related to the nutriment of relatedness of SDT; how this construct facilitates physical activity choices or motivation to participate in physical activity; and how the level of social support evolves and changes with life events or role evolution in women.

4. Investigation of the role of autonomous support in tailored interventions, extending findings from smoking cessation programs (Williams et al., in press) using SDT to provide individualized intervention to increase a woman's physical activity level.

5. Extending the investigation of perceptions of autonomy by addressing what "counts" as being active. Dishman and Steinhardt (1990) suggest that perceived control over one's health could be a key factor in understanding what is required for knowledge or intentions to be translated into motivation for action. This is crucial, considering the belief that some women have regarding their risk of disease and control over the disease process (Benrud & Reddy, 1998; Dishman & Steinhardt, 1990; Naimark et al., 1999; Wilcox & Stefanick, 1999). Perceptions of autonomy in selection of activity and competence in the skill required to participate in what counts as physical activity may influence behavior change in inactive women (Dattilo et al., 1994; King et al., 2000; Martin & Dubbert, 1982; Parham, 1999; Shaw, 1994).

Measurement Issues

The valid and reliable measurement of physical activity is a major issue for researchers who study physical activity (Ainsworth, 2000). Objective measures, such as pedometers or motion detectors, have been used in some clinical studies, but there are problems associated with their use. Valid and reliable instruments are expensive, making their use in large studies difficult, and although pedometers are economical, the precision with which they are able to reliably assess physical activity is questionable. A majority of published studies on physical activity rely heavily on self-report measures, and there are problems associated with the validity and reliability of these tools. The issue of self-report of activity for women is particularly salient, because activities that involve physical activity typically performed by women, such as

household chores, are often not included on self-report instruments. This issue is an area of research that is being addressed by Ainsworth (2000) but the accurate assessment of physical activity is problematic and continues to merit further attention.

Although there are limitations in self-report measures when investigating women's personal perceptions and interpretations of their roles and health behavior choices, self-reported perceptions should be the most relevant, especially within the SDT assumptions of active versus passive and the striving for competence (Keyserling et al., 2000; Martin & Dubbert, 1982). Qualitative investigations may re-direct/evaluate future development of quantitative measures by re-visiting how self-report reflects one's reality.

Another issue with regard to measurement was the length of time involved between initial assessment and follow-up measures to determine the impact of interventions for physical activity. The time frame for intervention was varied, and this may have be influenced the results. Incorporation of qualitative techniques in follow-up measures after an intervention may provide valuable information with regard to relapse and maintenance-focused interventions. Often in physical activity investigations, the participants who are followed-up are the adherers, not the dropouts (Marcus & Stanton, 1993).

Summary and Discussion

The status of women's health lags behind that of men, especially the health of minority women. More females than males in the U.S. report themselves as being in fair to poor health (USDHH, 1996a). The health benefits associated with physical activity are well-documented, but women continue to be less active than men, with older women and minority women being the least active segments of our society (USDHHS, 1996b). CVD is the overall leading cause for

death for females (USDHHS, 1996b), but women continue to underestimate their risk for CVD, and fail to recognize the positive impact that an active lifestyle can have on both quality of life and longevity. More research is needed to better understand women's experiences related to physical activity participation (Ainsworth, 2000).

In an effort to understand barriers to and facilitators of physical activity in women, three theoretical approaches to behavior change were explored in this review: HBM, SCM and SDT. The contributions of both HBM and SCM were recognized, as these two theories have provided important insights regarding interventions in health behavioral change. Specifically, HBM and SCM have provided a better understanding of initiation and readiness for behavior change in a variety of health behaviors. Alhough both of these models address the initiation of health behavior change, or beginning a program of physical activity, constraints of these models are evident in going beyond initiation and into maintenance.

The HBM, fundamentally rooted in primary prevention, provides descriptive information as to what components are involved in individuals' cognitive evaluation processes to initiate a behavior, but it does not offer insight as to the process of integrating the behavior change into everyday life after initiation. SCM enhances the contribution of HBM by incorporating stages of readiness for change and describing processes needed to enhance the likelihood of behavior change across those stages. The majority of current SCM literature, however, has been focused on the reliability of measurement of the different stages. Further investigation is needed to explore the processes that facilitate transition toward readiness, and how those processes can be effectively incorporated in interventions.

The continuum of processes identified in SCM also overlap and complement issues addressed in HBM. Table 6 illustrates similarities between the two theories. There are processes within the SCM that are not addressed in the HBM, specifically those broaching the action and maintenance stages. Although the instrumentation developed in the SCM model enables us to identify individuals who progress to these stages, many questions concerning how or why they are able to do so remain unanswered (Marcus et al., 2000; Orleans, 2000; Rothman, 2000).

Table 6

Comparison of HBM and SCM

Stages of Change Model (SCM) Processes Continuum	Health Belief Model (HBM) Components
Consciousness raising - increasing level of awareness and accurate information	Perceived susceptibility - Individuals' perceptions of ones risk in contracting an illness, or belief in a current diagnosis.
Environmental reevaluation - affective and cognitive experiencing of one's environment and problems. Social liberation - noticing social changes that support personal changes. Self-liberation - belief in one's ability to change and commitment to act on that belief.	Perceived barriers - an individual's perception of the negative possibilities or barriers to take a given health action (i.e., Environmental barriers and ability barriers).
Self-reevaluation - affective cognitive experiencing of one's self and problems. (i.e. "is this bad enough to do something about?").	Perceived severity - an individual's perception of the consequences or cost of an illness, both socially and medically. For example, this component includes concerns about treatment vs. non-treatment.

SDT, by virtue of its integration of the strengths of the HBM and SCM and previous research, provides a framework to address the issue of maintenance and long term adoption of health enhancing behaviors. SDT offers a broader conceptual framework, integrating the

principles of these theories, as well as providing a basis for study for the motivation of long term behavioral change. SDT approaches behavior change from an individual's personal interpretation of the social context of a situation, given the current level of self-determination being experienced. Further, SDT considers social context to be a mediator for the level of self-determination experienced by an individual. The continuum of processes presented in the SCM are also addressed by SDT's internalization process, from which one's level of self-determination evolves. Mullan and Markland (1997) suggest there are variations of self-determination found across the stages of change in the exercise domain. Thus, process of behavior regulation from an SDT perspective allows researchers to investigate physical activity after initiation (HBM), and from the Action stage of SCM to the Maintenance stage as a process mediated by one's level of internalization of self-determined motivation.

An additional consideration in the use of SDT as an organizing framework for research to understand women's physical activity is the role that the three nutriments play in the progression of internalized motivation. Williams et al. (1996, 1998, & 1999) investigated the role of autonomous support, as well as perceptions of competence, in studies of medical interventions, and researchers in physical activity should continue to consider those nutriments. The third nutriment, relatedness, has not yet been fully explored, and seems to have particular applicability in the study of women and physical activity. A woman's perception of social support may, in fact, mediate her relatedness. Reis et al. (2000), in describing the commonalties of relatedness and social support, defines relatedness as a bi-directional construct that involves giving and receiving, or caring and being cared for, while social support is uni-directional, because it consists of receiving. Deci acknowledges that social support is an important part of an

individual's need to satisfy the relatedness nutriment. Using SDT to interpret the results of previous research suggests that the complex interaction of satisfying these nutriments should be a consideration for women. For example, family responsibilities/caretaker roles are often cited by women as perceived barriers to taking the time to engage in healthy behaviors such as exercise. Through the lens of SDT, it can be seen that those roles may be perceived as controlling, decreasing autonomy and motivation. That, in turn, may stifle the relatedness nutriment. Interventions that address the nutriments by fostering a sense of autonomy and competence with regard to those roles, and incorporating elements of social support should increase women's self-determination with regard to their physical activity, and ultimately facilitate internalized, intrinsic motivation that will lead to long term behavior change.

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APPENDIX B: INSTRUMENTS

Demographic Data Collection Guide

Participant Code:

Age:

Height:

Weight:

BMI:

Reason for clinic appointment:

Physician:

Married:

Children:

Transportation access:

Communication access:

Stage of exercise change:

Stages of Change Interview Guide

Adapted from Cardinal (1995) to be administered orally do to the varying levels of literacy of subjects."Regular exercise" equals three or more days per week for 20 minutes or more each day (e.g. swim, walk).

Interview questions begin with the question, "Tell me if you are physically active, or do you exercise?"

If yes:

How long have you been doing that?

If 3 or more days a week for at least 20 minutes ("regularly"), or for six months or longer, code as **Maintenance stage.**

If just started "regularly" within the last six months, it has not been for six months yet; code as **Action stage.**

If just started "regularly" or on-and-off, but it has not been "regularly", code as **Preparation stage**.

If no:

Have you ever thought about it?

If no:

code as **Precontemplation stage**

If yes:

Do you plan to start with in the next six months?

If with in six months, code as **Contemplation stage**.

CAPS Physical Activity Log

ID # _____Day of the Week _____Day # _____Date _____/_____/_____

			Amount of Time Hours:	Amount of Time Minutes
Household				
Indoors				
Cooking	Yes	No	_____	_____
Cleaning up	Yes	No	_____	_____
Laundry	Yes	No	_____	_____
Shopping	Yes	No	_____	_____
Dusting	Yes	No	_____	_____
Scrubbing	Yes	No	_____	_____
Vacuuming	Yes	No	_____	_____
Home Repair	Yes	No	_____	_____
Mopping	Yes	No	_____	_____
Washing Car	Yes	No	_____	_____
Other	Yes	No	_____	_____
Outdoors				
Mowing lawn	Yes	No	_____	_____
Raking lawn	Yes	No	_____	_____
Weeding	Yes	No	_____	_____
Sweeping	Yes	No	_____	_____
Shoveling	Yes	No	_____	_____
Pruning	Yes	No	_____	_____
Chopping Wood	Yes	No	_____	_____
Other	Yes	No	_____	_____
Care of Others				
Bathing	Yes	No	_____	_____
Feeding	Yes	No	_____	_____
Playing	Yes	No	_____	_____
Lifting	Yes	No	_____	_____
Pushing Wheelchair	Yes	No	_____	_____
Transportation				
Drive Car	Yes	No	_____	_____
Ride in Car	Yes	No	_____	_____
Walking				
To get places	Yes	No	_____	_____
For exercise	Yes	No	_____	_____
With the dog	Yes	No	_____	_____
Work breaks	Yes	No	_____	_____

			Hours:	Minutes
Dancing				
In church	Yes	No	_____	_____
For pleasure	Yes	No	_____	_____
Other	Yes	No	_____	_____
Sports				
Golf	Yes	No	_____	_____
Team Sports	Yes	No	_____	_____
Other	Yes	No	_____	_____
Conditioning				
Aerobics	Yes	No	_____	_____
Jogging	Yes	No	_____	_____
Swimming	Yes	No	_____	_____
Bicycling	Yes	No	_____	_____
Stretching	Yes	No	_____	_____
Weight lifting	Yes	No	_____	_____
Other	Yes	No	_____	_____
Inactivity				
Watching TV	Yes	No	_____	_____
Read or sew	Yes	No	_____	_____
Use computer	Yes	No	_____	_____
Other	Yes	No	_____	_____
Occupation				
Sitting tasks	Yes	No	_____	_____
Standing tasks	Yes	No	_____	_____
Walking tasks	Yes	No	_____	_____
Heavy labor	Yes	No	_____	_____
Volunteer				
Sitting tasks	Yes	No	_____	_____
Standing tasks	Yes	No	_____	_____
Walking Tasks	Yes	No	_____	_____
Heavy labor	Yes	No	_____	_____

Monitors

Time Put ON _____ a.m.

Time Taken OFF _____ a.m.

Steps Taken _____

EXERCISE REGULATIONS QUESTIONNAIRE (BREQ)

Age: _____ years Sex: Male Female (Please circle)

Why Do You Engage in Exercise?

We are interested in the reasons underlying people's decisions to engage, or not to engage in physical exercise. Using the scale below, please indicate to what extent each of the following items is true for you. Please note that there are no right or wrong answers and no trick questions. We simply want to know how you personally feel about exercise. Your responses will be held in confidence, used only for our research purposes.

	Not true for me	Sometimes true for me	Very true for me
1. I exercise because other people say I should.	0	1 2	3 4
2. I feel guilty when I don't exercise.	0	1 2	3 4
3. I value the benefits of exercise.	0	1 2	3 4
4. I exercise because it's fun.	0	1 2	3 4
5. I take part in exercise because my friends/family/partner say I should.	0	1 2	3 4
6. I feel ashamed when I miss an exercise session.	0	1 2	3 4
7. It's important to me to exercise regularly.	0	1 2	3 4
8. I enjoy my exercise sessions.	0	1 2	3 4
9. I exercise because others will not be pleased with me if I don't.	0	1 2	3 4
10. I feel like a failure when I haven't exercised in a while.	0	1 2	3 4
11. I think it is important to make the effort to exercise regularly.	0	1 2	3 4

Why Do You Engage in Exercise? (Cont'd)

	Not true for me	Sometimes true for me		Very true for me	
12. I find exercise a pleasurable activity.	0	1	2	3	4
13. I feel under pressure from my friends/family to exercise.	0	1	2	3	4
14. I get restless if I don't exercise regularly.	0	1	2	3	4
15. I get pleasure and satisfaction from participating in exercise.	0	1	2	3	4

Thank you for taking part in our research.

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April 2000

APPENDIX C: INTERVIEW GUIDE

Qualitative Study Interview Protocol:

1. What is your definition of Health? Describe what being healthy means to you.

2. A. According to your description, how healthy are you right now?

   B. Do you have control of being healthy? Probe - why or why not?

   C. What keeps you at your current health status?

   If applicable: What makes it hard for you to be as healthy as you want to be?

3. Do you plan or are you doing anything currently to change your health?

4. How would you define or describe physical activity or exercise? What counts? For example, if your doctor asked if you were physically active or if you exercise, what type of activity or movement would count?

5. A. How important do you think physical activity or exercise is as a component of being healthy?

   B. Describe your current level of physical activity.

   C. How does your current level of physical activity compare with your past level?

   Probe: If there is change, what influenced that change?

   D. Do you have any plans to change your level of physical activity in the future? If so why or why not?

6. Do you have any goals for you health?

7. What are some positive factors about your health?

8. What are some negative factors about your health?

9. Do you think becoming physically active or exercising will change your health any? If so why?

10. If I were magic, and could do what ever it takes to get you to become more physically active or exercise, what would I have to do? No limits? And why?

Case Study Interview Protocol

Medical History

- What type of medical problems have you had in the past and or experience currently? And if you increased your activity level or exercise amount, would any of those health or medical problems improve ?

Family/Social History

- What was your childhood like? Were people in your family healthy? Did they exercise or were they physically active? Tell me about where you grew up, what did people do? Tell me about your teenage years. . . Where did you live? What did you do? And up until now, where have you lived?
- What do you do every day? How long have you done that? Who lives with you? Do you have friends or close family members? When do you spend time with your favorite people? What do you do together?
- Do you have a role model or someone you look up to now as you did when growing up? Tell me about that person.

Relatedness

- Do they know anything about your health? Are they physically active people? Are they healthy? How often do you talk to them?

Autonomous Support

- Have you ever been told to become more active by a doctor or medical person? If so, when and why? What did they say? What did you think about what they said? What did you do with that information? How could they help you, or did they help you become physically more active or exercise more? Do you think that the medical people think you can be more active? What else do you need from them to help you?

Competence

- Do you think you could do what they tell you to do? Why or why not? What else would you need to increase your physical activity level?

Autonomy

- What kind of choices do you feel you have concerning your health?

  Do you think you have a choice to become or stay physically active? Why or why not?

Life Expectations

- Where do you see yourself, at 70 or 80 years old? What will you be like? How healthy will you be? How will you get there (to that health state)? Will you be physically active? Why or why not? Tell me about how your life will be.

Relatedness [Per correspondence with Vannessa Tobin]

- If you were to become physically active or are active, how do you or would you think you would feel when you exercise? Who encourages you to be more active or continue to be active? How do they encourage you?

VITA

Joan B. Landry received her Bachelor of General Studies from the University of Southwestern Louisiana in May of 1991, and her Master of Education in health promotion from McNeese State University in 1996. She then continued her education by attending Louisiana State University, to earn a doctorate in pedagogy from the Department of Kinesiology; completion of degree requirements in December of 2002. Joan holds membership in many professional organizations; among these are the American Educational Research Association (AERA), the American Alliance of Health Physical Education, Recreation and Dance (AAHPERD), and the Louisiana Association of Health, Physical Education, Recreation and Dance (LAHPERD), as well as the presidency in the Association of Professional Health Educators of Louisiana (APHELA). Joan has presented national oral presentations at the AAHPERD, and the LAHPERD conferences; in addition, she has contributed many articles to APHELA's newspaper, The Catalyst. Joan has also published research in the journal Quest. Her scholastic awards include the Corbett Summers Research Scholarship from the Kinesiology Department of Louisiana State University, 2001; and the AOII Foundation Diamond Jubilee Scholarship, 2001. Joan's knowledge and experience have earned her numerous certifications; she is presently certified as a Health Education Specialist, a Serological Counselor, a BLS & AED Instructor by the American Heart Association, an Emergency Medical Technician, and an EMS Instructor and Skill Test Examiner for the Department of Health and Hospitals, State of Louisiana. Joan plans to incorporate this extensive background into future opportunities with the Louisiana State University Health Science Center at Shreveport, Louisiana after graduation.