MR & MRS: HOW 'I DO' IMPACTS PHYSICAL ACTIVITY IN MARRIED INDIVIDUALS

A Dissertation

by

KACY LANE MICHEL

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

May 2012

Major Subject: Health Education

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Approved by:

Chair of Committee,	B. E. Pruitt
Committee Members,	Patricia Goodson
	Lisako McKyer
	Kim Dooley
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ABSTRACT

Mr and Mrs: How 'I Do' Impacts Physical Activity in Married Individuals. (May 2012)

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This dissertation presents three separate studies designed to investigate the relationship between marriage and physical activity behavior. First, a systematic literature review of nineteen articles presents qualitative and quantitative articles from 2000 to 2010 that focus on the relationship between marriage and physical activity and/or exercise. Based on the findings from the review, social support (or lack of support), culturally-determined gender roles, environmental factors such as income level, and intrapersonal factors such as self-efficacy each influenced spousal physical activity.

Secondly, a qualitative study based on interviews and photographs from twenty-four married individuals utilized Social Cognitive Theory to explore the mechanisms, determinants, and influences of spousal physical activity. Findings indicate verbal persuasion by husbands encouraged wives, yet verbal persuasion by wives was perceived as nagging by men. While verbal persuasion by husbands increased a small number of wives' sense of self-efficacy, the majority of women felt that persuasion increased *motivation*, not necessarily confidence. Findings also highlighted the power of

modeling to increase husbands' physical activity. Overwhelmingly, men reacted more positively to modeling than verbal persuasion.

Lastly, a second qualitative piece employed General Systems Theory to conceive of the marital unit as a type of system working within other broader systems. Findings highlighted the desire for increased quality time as a motivator for physical activity within the marital system. Also, the larger cultural, occupational, and familial systems greatly influenced marital dyads. Cultural expectations to be the primary caregiver negatively impacted wives while occupational pressures negatively influenced both parts of the marital dyad. Regarding the familial system, parents cited the influence of their own parents as well as a desire to "pass on" exemplary physical activity habits to their children. Finally, couples with children highlighted an increase in exercise frequency yet decrease in exercise intensity.

ACKNOWLEDGEMENTS

It is “by the grace of God I am what I am” (I Corinthians 15:10), and so I start this acknowledgements section giving all honor and glory to God, with whom all things are possible. I thank God for blanketing me with peace, and for working *all* things together for my good, for growing me spiritually, and for allowing me the honor of being His servant.

I am supremely blessed with a family who loves and supports me in all my endeavors. Thanks to my mother, Janice Gadberry, for consistently encouraging me with the words of Winston Churchill: “Never, never, never quit,” and to my father, Michael Gadberry, for embodying that quote my entire life. To my husband, Mark Michel, I believe Ray LaMontagne said it best in his classic anthem, “You are the Best Thing.” I love you.

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Lastly, I am indebted to my committee: Dr. Buzz Pruitt, Dr. Patricia Goodson, Dr. Lisako McKyer, and Dr. Kim Dooley for their advice, guidance, patience, and time. Thank you. It has been a supreme privilege.

NOMENCLATURE

C	Couple(s)
GST	General Systems Theory
H	Husband(s)
PA	Physical Activity
SCT	Social Cognitive Theory
SE	Self-Efficacy
W	Wife/Wives

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CHAPTER I

INTRODUCTION

Arguably, one of the most significant relationships in life is marriage. Couples share a physical dwelling, a life, and even health outcomes. For example, a 2004 survey by the Centers for Disease Control and Prevention revealed married individuals are less likely to smoke, drink heavily, suffer back pain, or experience serious distress. Meyler, Stimpson, and Peek (2007) found spouses also tend to have similar Body Mass Indexes and blood pressure readings. Researchers from the Centers for Disease Control and Prevention asserted: "the association between marital status and health is striking…and persists throughout the age groups" (p. 1).

While the association between marriage and certain health outcomes is clear, scholars debate as to the relationship between marriage and physical activity. For example, Craig (1990) concluded married individuals have lower exercise levels. Yet, the Centers for Disease Control and Prevention (2004) have published reports outlining how married adults are more active than unmarried. Waite and Gallagher (2000) suggested married people are more physically active than single adults.

Not only is there debate about the direction of the relationship between marriage and physical activity, few researchers have studied *why* and *how* marriage impacts exercise and/or physical activity. Instead, researchers have mostly examined marriage

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This dissertation follows the style of *American Journal of Health Studies.*

and physical activity as demographic variables only. For example, Bener, Zirie, and Al-Rikabi (2005) conducted a study using physical activity and marriage as covariates related to diabetes. Unfortunately, correlational studies tell very little about the true story of what occurs within marriage. Hull et al. (2010) conducted a two-year study examining physical activity in married individuals and concluded "current literature is ambiguous as to how marriage impacts physical activity" (p. 577).

Because the mechanisms through which partners influence each other are uncertain, the driving question of this entire dissertation was: *How may the context of marriage influence spousal physical activity?* The answer to this question fills an important gap in our understanding as health educators.

Instead of researching this subject quantitatively, I sought to qualitatively understand the lived experience of several married individuals using photo-elicitation and in-depth interviews. Additionally, a comprehensive, systematic review of the existing literature helped ground the qualitative portion of this dissertation.

The current document is separated into five distinct chapters. It should be noted that Chapters II-IV were written as self-contained manuscripts to be submitted for publication in peer-reviewed journals. The three articles in this dissertation are comprised of one systematic literature review and two qualitative research manuscripts. The systematic literature review systematically examined and organized the current body of research literature documenting the influence of marriage on spousal physical activity. I assessed the quality of this literature based on explicit methods of appraisal gauging each study's methodology, strength of research design, and theory usage.

The second paper is a qualitative study exploring the relationship between marriage and physical activity habits among a sample of married couples. The qualitative techniques of in-depth interviews, field notes, and photo-elicitation triangulated the inquiry, and the data gleaned were open coded following the constant comparative method (Glaser & Strauss, 1967). Using axial coding, data were organized according to Social Cognitive Theory constructs. This article used the SCT reciprocal triad to explore the relationship between marriage and physical activity habits.

Finally, the third article represents a second qualitative piece. This article explored the relationship between marriage and physical activity using a different theoretical perspective, Bertalanffy's General Systems Theory (1967). Instead of focusing on self-efficacy, modeling, and verbal persuasion, in this article, I conceived of the marital unit as a type of system working within other systems (i.e. cultural, occupational, and familial systems). How these other broader systems may influence the smaller marital system regarding physical activity behavior was the focus of the inquiry.

CHAPTER II

THE IMPACT OF THE MARITAL CONTEXT ON PHYSICAL ACTIVITY HABITS: A SYSTEMATIC LITERATURE REVIEW

INTRODUCTION

Marital concordance studies have shown a strong correlation between one spouse's physical activity level and the other's (Monden, 2007; Meyler et al., 2007). For instance, Falba and Sindelar (2008) surveyed 6,072 married individuals to assess the spousal concordance in health behavior, including exercise habits. Results indicated a positive relationship existed between one spouse's exercise behavior and the other spouse's behavior. In that study, continual exercise by one spouse was also associated with a new upsurge in exercise by the other spouse.

Yet, concordance studies have seldom investigated *why* certain married couples share similar physical activity behavior or *why* other couples are discordant in physical activity and/or exercise. Besides the obvious (i.e. shared physical environment), what in the marriage impacts the physical activity of each spouse? What in the interpersonal relationship? What in the modeling? What in the social support? What in the way spouses communicate with each other? In other words, what *matters* in marriage when it comes to physical activity?

Unfortunately, many research studies haven't focused on these questions. Instead, marital status and physical activity have generally been examined as covariates.

For example, when searching the Medline (Ovid) database with the terms “physical activity” and “marriage,” 712 articles were retrieved. A primary screening of article abstracts revealed approximately 635 studies mentioned the covariates of physical activity and marriage as related to specific medical conditions such as diabetes (Bener et al., 2005) and smoking (Ortega et al., 2011).

Instead of focusing on marital status and physical activity as mere covariates relating to other conditions, I felt it imperative to identify the factors and determinants of physical activity in and of themselves. What are the mechanisms that influence physical activity in marriage? What research identifies these mechanisms?

The objective of this inquiry was to systematically review the current body of knowledge for research investigating aspects of marriage which may influence the physical activity of couples collectively and/or spouses individually.

Statement of Purpose

According to Homish and Leonard (2008), “understanding how partners influence each other’s health behavior is important for health promotion and intervention efforts” (p. 754). However, debate exists as to the relationship between marriage and activity. Studies by Craig (1990) and Craig and Truswell (1988) demonstrated married individuals are less activity than unmarried; studies by Waite and Gallagher as well as the Centers for Disease Control and Prevention showed married individuals are *more* active than their single counterpoints. Due to the ambiguity of these findings, it was important to systematically review the extant literature to better understand the relationship between marriage and physical activity and/or exercise.

Since the mechanisms through which partners influence each other are uncertain, the driving question of the review was: *What aspects of the social and interpersonal context of marriage influence spousal physical activity?* If health educators better understood this influence, interventions could be targeted to the family system, for "targeting the couple for health promotion activities could benefit the couple more than simply targeting individuals" (Homish & Kennth, 2008, p. 754).

Nomenclature

For clarity, I adopted the following nomenclature for this study: couple(s) and spousal pair(s) indicates a marriage unit (two people married to each other); married individual(s) indicates a married person whose spouse may or may not be included in a study.

Relevant Reviews

Keicolt-Glaser and Newton (2001) conducted a systematic literature review pertaining to the physical health and/or physiological function of married individuals. Authors were particularly interested in the connection between perceptions of marital quality and health outcomes such as chronic pain, immune system disease, and rheumatoid arthritis. For example, one question the review sought to answer was: Are individuals in unhappy marriages more likely to report chronic pain? The current review is distinct from the Keicolt-Glaser and Newton review in that this article focused exclusively on the interaction between married individuals and subsequent physical activity. Instead of examining correlations between overall marital quality (i.e. marital adjustment, marital discord, and marital satisfaction) and general health/physiological

function such as chronic pain, this review gathered studies reporting on the interpersonal relationship within couples as related to exercise, physical activity, or leisure time activity.

Another relevant review was published by Meyler et al. in 2007. The review centered on marital health concordance or the degree to which spouses report similar health behavior. Authors organized the findings into three broad categories: mental health, physical health, and health behavior. While not focusing specifically on physical activity, the "health behavior" category did include a few articles (N=3) related to exercise and/or physical activity. The current review expanded on the physical activity subcategory contained within Meyler's "health behavior" category.

METHODS

Retrieval

Following the systematic review procedures outlined by Garrard (1999), I searched the electronic databases of Cambridge Scientific Abstracts (CSA), Ebsco Host (Academic Search Premiere), and Ovid to explore research-based articles associated with marriage and physical activity. I searched in the following academic fields: Health (Health Sciences: SAGE, Global Health, Embase, Cinhal), Recreation (Sportdiscus), Psychology (Psych INFO, Sociology Abstracts, and Physical Education index), and Medicine (Ovid) using several variations of the key terms *marriage, spouse, partner, physical fitness, exercise, and physical activity*. Primary screening consisted of scanning

article abstracts, and secondary screening involved reading articles in their entirety. I set the end date for searching as July 1st, 2011.

Inclusion/Exclusion Criteria

For inclusion in the review, studies must have: (a) been published in a peer-reviewed, English language journal, (b) discussed or empirically examined marital influence on physical activity habits, (c) been published after 2000, (d) sampled heterosexual married individuals, and (e) pertained to physical activity or exercise. I included studies employing qualitative or mixed methods in this review. I excluded studies if they described marital status and physical activity as covariates only, or pertained to homosexual couples. In order to sample the most current literature, I limited the sample to include only articles published before 2000. Nineteen (n=19) publications met these criteria and comprised the final sample.

While the relationship between homosexual couples and physical activity habits may be significant, empirical data from a 2004 Centers of Disease Control and Prevention survey on marriage and health showed that heterosexual and homosexual couples do not share similar health outcomes. The survey found homosexual couples have more variability in physical activity habits than heterosexual couples, and heterosexual couples were more likely to be physically activity overall (CDC, 2004). Due to the variability within this population and the relatively low number of studies focusing on the physical activity habits of homosexual couples, I chose to narrow the focus to heterosexual couples. Nevertheless, this focus does not negate the need for future reviews to consider summarizing that body of research, as it may provide

important insights into the relationship between physical activity and homosexual partnerships.

Methodological Quality Assessment

In order to objectively compare each article's methodological quality, I established a qualitative and quantitative coding system. I adapted the quantitative assessment scheme from a similar coding system created by Zhang and Goodson (2011). The quantitative assessment evaluated theory usage, sample size, type of study design, validity and reliability reporting, and strength of analytical method. Total points possible for the quantitative Methodological Quality Score (MQS) were twelve. An example of the criteria can be found in Appendix A.

To fairly assess the qualitative studies, I developed a new coding system. According to Lincoln and Guba (1985), the best qualitative studies use trustworthy documents and methods to ensure credibility, transferability, dependability, and confirmability. In Erlandson, Harris, Skipper and Allen (1993), authors expanded upon these four concepts by outlining ways in which a qualitative article could demonstrate trustworthiness. According to the authors, qualitative researchers should use thick description, purposive sampling, or reflexive journals to establish transferability. Thus, the qualitative assessment in this review utilized these standards as benchmarks. Total points possible for the qualitative MQS were seven. An example of the criteria can be found in Appendix B.

For studies employing a mixed methods design, I assessed the quantitative and qualitative portions separately using the MQS criteria appropriate for each type of

research. I then averaged these two scores to arrive at a total methodological quality score for a mixed methods study (see matrix).

Data Abstraction

To systematically record other relevant study components, I adopted the Matrix Method (Garrard, 1999). These components included: sample size, country of origin, theoretical framework, study design, analytical method, findings or themes, and methodological quality. Due to multiple findings in several articles, the total number of findings exceeded the total number of articles.

To be considered a finding, a quantitative study must have shown a statistically significant relationship between physical activity and another variable. A positive relationship meant that as a variable increased (e.g. social support), physical activity or exercise increased. A negative association meant that as a variable increased (e.g. perceived barriers), physical activity decreased. For the health concordance studies, a positive relationship indicated couples shared similar exercise behavior. To be considered a qualitative theme, authors must have documented a qualitative research method such as interviews, focus groups, or observations.

FINDINGS

Studies' Characteristics

Of the 2,134 screened articles, fourteen quantitative, three qualitative, and two mixed method studies met the inclusion criteria and appear in the final matrix (see Table 1). Fifteen of the nineteen studies originated in the U.S., with an additional four studies conducted in Sweden, Australia, China, and New Zealand. The majority were published in psychology (n=5) or health education/behavior journals (n=5); three were published in population specific health journals (such as *Journal of Aging and Health)*; and the remaining were published in journals pertaining to nursing (n=2), physiotherapy (n=2), epidemiology (n=1), and sport (n=1). The *Journal of Health Psychology* published the most articles (n=3).

While the majority of studies sampled both parts of the marital dyad (n=10), six studies sampled married individuals, and three sampled both married couples as a unit and married individuals.

Table 1. Systematic literature review matrix

Ref #	Author/ Date/Journal	Sample	Country	Measurement	Theoretical Framework	Study Design	Analytical Method	Findings or Themes	MQS
1	Ayotte et al. (2010) *Journal of Health Psychology*	116 middle to late-age couples	US	Self-efficacy, social support (Positive Social Influence Scale), outcome expectancies (Benefits of Physical Activity Scale), self-regulatory behavior (Exercise Planning and Scheduling Scale), perceived barriers (Perceived Barriers to Exercise scale)	EX: SCT	Cross-sectional	SEM	Self-efficacy: indirectly related to p.a.; perceived barriers: directly related to p.a.; sig. association between social support and p.a.	**Quantitative** Theory: 2 Validity: 1 Reliability: 2 Measures: 2 Design: 0 Data analysis: 2 Effect size: 1 Total: 10/12 (83%)
2	Beverly and Wray (2010) *Health Education Research*	30 couples (one diabetic partner per dyad)	US	Focus groups investigating how marriage influences exercise behavior in diabetes patients and their spouses	EX: SCT, Social Support	Basic qualitative	Content Analysis	Collective support: couples who felt they were 'in this together' were more supportive of each other regarding p.a.; collective lack of motivation was a common barrier; collective responsibility: managing an exercise program was either enhanced or limited by the cooperation of the spouse	**Qualitative** Theory: 2 Credibility: 1 Transferability: 1 Dependability: 1 Confirmability: 1 Sampling: 1 (intensity sampling) Total: 7/7 (100%)

Table 1. Continued

Ref #	Author/ Date/Journal	Sample	Country	Measurement	Theoretical Framework	Study Design	Analytical Method	Findings or Themes	MQS
3	Burke at al. (2002) *Asian Pacific Journal of Clinical Nutrition*	137 couples randomly assigned to three different exercise groups [control, low level (received six modules by mail every 2 weeks for four months), and high level (same as low plus contact sessions w/ facilitators every 2 wks)]	Australia	Perceived barriers, self-efficacy, dietary intake, physical activity, blood pressure	IM: SCT, Social Support	Longitudinal	Random-Effects Modeling	High level group: p.a. self-efficacy increased and perceived barriers to exercise decreased; time spent exercising increased in the high and low level groups. Qualitative data from focus groups indicated social support as benefiting couples and couples reported spouses reinforced positive exercise behavior	**Mixed Method** **Quantitative Score:** Theory: 1 Validity: 0 Reliability: 0 Measures: 0 Design: 1 Data analysis: 1 Effect size: 0 Total: 3/12 (25%) **Qualitative Score:** Theory: 1 Credibility: 0 Transferability: 0 Dependability: 0 Confirmability: 0 Sampling: 1 Total: 2/7 (28.6%) **Average: (26.8 %)**
4	Cedervall and Critina (2010) *Physiotherapy Theory and Practice*	2 couples (two men w/ Alzheimer's disease and their wives)	Sweden	In-depth interviews focusing on how the couple collectively managed the husbands' decline in physical activity	None	Case Study	Thematic Analysis	Barriers to p.a.: AD decreased husband's motor function; p.a. as health reinforcement: participating individually or with their spouses in exercise reinforced the behavior; adaption strategies: wives adapted their p.a. to accommodate husbands	**Qualitative** Theory: 0 Credibility: 1 Transferability: 1 Dependability: 1 Confirmability: 1 Sampling: 1 Total: 5/7 (71.4 %)

Table 1. Continued

Ref #	Author/ Date/Journal	Sample	Country	Measurement	Theoretical Framework	Study Design	Analytical Method	Findings or Themes	MQS
12	Chun and Chelsa (2004) *Psychology and Health*	17 diabetic Chinese immigrants; 7 spouses	US	In-depth interviews examining how physical activity in diabetes patients	IM: Acculturation Theory	Basic qualitative	Interpretive phenomenology	Cultural beliefs: couples believed that strenuous p.a. can compromise health and that exercise can result in over-work; impact of work: couples reported their jobs involved heavy labor, so couples were less likely to engage in p.a.	**Qualitative** Theory: 1 Credibility: 1 Transferability: 1 Dependability: 1 Confirmability: 0 Sampling: 1 Total: 5/7 (71.4 %)
13	Falba and Sindelar (2008) *Health Research and Educational Trust*	6,072 middle to late-age married individuals	US	Physical activity: improvement in p.a. behavior (versus none)	EX: Grossman Health Demand Model	Longitudinal	Multiple Linear Regression	Positive effect of one spouse's exercising behavior on the other's exercise activity; continual exercise by one spouse associated with a positive behavioral change as a new upsurge in exercise by the other spouse	**Quantitative** Theory: 2 Validity: 0 Reliability: 0 Measures: 0 Design: 1 Data analysis: 1 Effect size: 0 Total: 4/12 (33 %)
9	Hancher-Rauch and Hyner (2005) *American Journal of Health Studies*	39 married men; 67 married females	US	Physical activity: (Baecke Questionnaire of Habitual Physical Activity, social support (Social Support and Exercise Survey), perceived health (Short Form-36 Health Survey), quality of life (Ferrrans and Powers Quality of Life Index)	IM: Social Support	Cross-sectional	T-test	Statistically significant difference in mean spousal support scores for subjects who described their spouses as regular exercises as compared to subjects who had non-exercising spouses; regardless of gender, subjects who had active spouses received support for their exercise regimens from their partners	**Quantitative** Theory: 1 Validity: 1 Reliability: 1 Measures: 0 Design: 0 Data analysis: 0 Effect size: 0 Total: 3/12 (25 %)

Table 1. Continued

Ref #	Author/ Date/Journal	Sample	Country	Measurement	Theoretical Framework	Study Design	Analytical Method	Findings or Themes	MQS
15	Homish and Leonard (2008) *American Journal of Health Behavior*	634 couples	US	Exercise, physical examination, healthy eating, unhealthy eating	IM: Health Concordance Theory	Longitudinal	Generalized Estimating Equations Model	Positive association b/w wives who engaged in regular exercise and husbands' exercise habit; husbands' exercise significantly associated with wives' exercise over time; wives with more education and those who didn't have children were more likely to engage in exercise	**Quantitative** Theory: 1 Validity: 0 Reliability: 2 Measures: 0 Design: 1 Data analysis: 2 Effect size: 0 Total: 5/12 (42 %)
5	Hong et al. (2005) *Health Psychology*	99 couples (one cardiac rehabilitation patient per dyad)	US	Exercise support provided, exercise support received, exercise similarity	EX: Actor-Partner Independence Model, Transtheoretical Model of Behavior Change	Cross-sectional	SEM	49 couples reported similar exercise behavior: for those couples, intended exercise support given by one spouse was perceived as such by the other; 50 couples reported different exercise behavior: partner effects were non-significant, no relationship b/w exercise support provided by one spouse and that received by the other	**Quantitative** Theory: 1 Validity: 0 Reliability: 2 Measures: 0 Design: 0 Data analysis: 2 Effect size: 1 Total: 6/12 (50 %)

Table 1. Continued

Ref #	Author/ Date/Journal	Sample	Country	Measurement	Theoretical Framework	Study Design	Analytical Method	Findings or Themes	MQS
6	Jenson, Sulsa and Lemos (2003) *Women and Health*	54 married male cardiac rehabilitation patients, 26 female married patients	US	Patient risk status, activity level	None	Longitudinal	ANOVA	Women expended more energy on domestic responsibilities and were more active sooner than the men; men engaged more in repairs, yard work, and carrying; men were involved in less rigorous and more sporadic physical activity as compared to women; domestic and traditional role expectations on married women was cited as a reason for sooner, more rigorous activity	**Quantitative** Theory: 0 Validity: 1 Reliability: 0 Measures: 0 Design: 1 Data analysis: 2 Effect size: 0 Total: 4/12 (33%)
7	Juarbe, Lipson, and Turok (2003) *Journal of Transcultural Nursing*	51 married Mexican immigrant women	US	Anthropomorphic measures, physical activity frequency and intensity, attitudes, beliefs, and physical activity practices	IM: Acculturation Theory	Cross-sectional qualitative and quantitative survey	Thematic Analysis/ Descriptive Statistics	89% mentioned husbands' and other family members' negative cultural perceptions and values (i.e. women should not exercise and it could be harmful to reproductive health); most common barrier to p.a. was husbands' lack of support because culturally exercising was associated trying to look "sexy"; working women said culturally defined gender expectations required them to work and run the household (leaving no time for exercise)	**Mixed Method** **Quantitative Score:** Theory: 1 Validity: 1 Reliability: 2 Measures: 2 Design: 0 Data analysis: 0 Effect size: 0 Total: 6/12 (50%) **Qualitative Score:** Theory: 1 Credibility: 1 Transferability: 1 Dependability: 1 Confirmability: 0 Sampling: 1 Total: 5/7 (71.4%) **Average: (60.7 %)**

Table 1. Continued

Ref #	Author/ Date/Journal	Sample	Country	Measurement	Theoretical Framework	Study Design	Analytical Method	Findings or Themes	MQS
14	Jurj et al. (2006) *Annals of Epidemiology*	66,130 couples	China	Wives' life-style characteristics (including physical activity) were treated as DVs and husbands' lifestyle characteristics were treated as IVs	None	Cross-sectional	Logistical Regression	Women were more likely to exercise regularly if their husbands had the same habit	**Quantitative** Theory: 0 Validity: 0 Reliability: 0 Measures: 0 Design: 0 Data analysis: 1 Effect size: 1 Total: 2/12 (17 %)
11	Lewis et al. (2004) *Journal of Social and Personal Relationships*	100 couples	US	Social power (Power Tactics Scale), social support	EX: Social Control Theory	Cross-sectional	Bivariate Statistics	Most frequently reported health behaviors wives were trying to change in husbands: eating healthy foods (39%), seeing a doctor (10%), and exercising more or starting (9%); most behavior husbands were trying to change in wives was exercising more (36 %), eating healthier foods (16%), and seeing a doctor (6%)	**Quantitative** Theory: 2 Validity: 2 Reliability: 1 Measures: 0 Design: 0 Data analysis: 0 Effect size: 0 Total: 5/12 (42%)
17	Macken, Yates, and Blancher (2000) *Journal of Clinical Rehabilitation*	177 married men with coronary heart disease and their spouses	US	Smoking, physical activity, height and weight, hypertension, and high blood cholesterol (Modified Behavioral Risk Factor Surveillance System)	EX: Health Concordance Theory	Cross-sectional	Correlation	Statistically significant concordance b/w patient and spousal pairs for frequency and distance of exercise; no statistically significant concordance regarding current exercise program and duration of exercise	**Quantitative** Theory: 2 Validity: 1 Reliability: 1 Measures: 0 Design: 0 Data analysis: 0 Effect size: 0 Total: 4 /12 (33 %)

Table 1. Continued

Ref #	Author/ Date/Journal	Sample	Country	Measurement	Theoretical Framework	Study Design	Analytical Method	Findings or Themes	MQS
16	Pettee et al. (2006) *Medicine & Science in Sports & Exercise*	345 late-aged spousal pairs	US	Physical activity (Minnesota Leisure-time Physical Activity Assessment)	IM: Health Concordance Theory	Cross-sectional	Logistical Regression	Low active men and women were less likely to have a high school education and had a lower annual income (for men only) when compared with the high active group of men and women; spouses were statistically concordant regarding physical activity	**Quantitative** Theory: 1 Validity: 1 Reliability: 0 Measures: 0 Design: 0 Data analysis: 1 Effect size: 1 Total: 4/12 (33%)
10	Raglin (2001) *Quest*	30 married individuals enrolled in an exercise program alone, 32 married individuals enrolled in the program with their spouse	US	Psychological assessment (Profile of Mood States),self-motivation (Self-Motivation Inventory), physiological tests	EX: Social Support Theory	Longitudinal	Bivariate Statistics	Of the married-pairs, 6.3% dropped out, of married individuals completing the program alone, the dropout rate was 43%; lack of social support and family responsibilities were most common reasons for dropout	**Quantitative** Theory: 2 Validity: 1 Reliability: 0 Measures: 2 Design: 1 Data analysis: 0 Effect size: 0 Total: 6/12 (50%)
8	Satariano, Haight, and Tager (2002) *Journal of Aging and Health*	511 couples	US	Leisure-time physical activity, cigarette smoking, alcohol consumption, mental well being	None	Cross-sectional	Multinominal logistical regression	LTPA of partner was most significant predictor of the LTPA of the participant; strong association b/w moderately vigorous and highly vigorous levels of activity in one spouse and similar levels of activity in the other spouse; higher LTPA correlated with more than 12 yrs of education in wives	**Quantitative** Theory: 0 Validity:1 Reliability: 0 Measures: 0 Design: 0 Data analysis: 1 Effect size: 1 Total: 3 /12 (25%)

Table 1. Continued

Ref #	Author/ Date/Journal	Sample	Country	Measurement	Theoretical Framework	Study Design	Analytical Method	Findings or Themes	MQS
18	Weinman et al. (2000) *Journal of Health Psychology*	114 cardiac rehabilitation patients and 84 spouses	New Zealand	Causal attributions, physical activity, smoking, diet, severity of cardiac disease, length of hospital stay	None	Longitudinal	Correlation and step-wise linear regression	Statistically significant association b/w increased levels and exercise in cardiac patients and the spouse's belief that poor health habits caused their partner's heart attack (this was the most important factor in improvements in levels of strenuous exercise at 6 months)	**Quantitative** Theory: 0 Validity: 0 Reliability: 0 Measures: 0 Design: 1 Data analysis:1 Effect size: 1 Total: 3/12 (25%)
19	Wilson (2002) *Social Science & Medicine*	4,746 couples	US	General health status (Self-assessed General Health Status), functional limitations (Index of Functional Limitations and Activity Restrictions), chronic disease (Weighted Chronic Disease Index)	EX: Simple Economic Theory	Cross-sectional	Linear Regression, Correlation	Statistically significant correlation between husband and wife exercise behavior	**Quantitative** Theory: 2 Validity: 1 Reliability: 0 Measures: 0 Design: 0 Data analysis: 1 Effect size: 1 Total: 5/12 (42%)

Thirty-seven percent (n=7) of studies were conducted with one or both spouses living with a chronic disease such as heart disease (n=4), diabetes (n=2), or Alzheimer's (n=1). Other population specific samples included Chinese immigrants (Chun & Chelsa, 2004), Mexican immigrant women (Juarbe, Lipson, & Turok, 2003), and late-aged spousal pairs (Pettee et al., 2006).

Studies' Methodological Quality

Overall Quality. The three qualitative articles in this sample had the highest collective average for methodological quality (80.93%). Following the qualitative studies, the two mixed methods studies averaged 43.75% in terms of overall methodological quality, and the fourteen quantitative articles had the lowest collective average (38.07%).

Theory. Less than half of the reviewed studies cited an explicit theoretical framework (n=8), and a quarter (n=5) indicated no theoretical perspective. Six studies included implicit theoretical considerations but didn't include any direct mention of an established or grounded theory. When research was theory-based, Social Support Theory (Beverly & Wray, 2010; Burke et al., 2002, Hancher-Rauch & Hyner, 2005; Raglin, 2001), Social Cognitive Theory (Ayotte, Margrett, & Hicks-Patrick, 2010; Beverly & Wray, 2010; Burke et al., 2002), and Health Concordance Theory (Homish & Leonard, 2008; Pettee et al., 2006; Macken, Yates, & Blancher, 2000) were the most common perspectives.

Focus. 53 percent of studies (n=10) didn't focus on the relationship between physical activity and marriage. Instead, researchers either examined physical activity in

relation to another health indicator (i.e. smoking, diet, or alcohol consumption) (n=5), or looked at physical activity in marriages dealing with one or both spouse living with a chronic disease (n=5). For example, Satariano, Haight, and Tager (2002) researched the leisure-time physical activity of married individuals to see if there was an association between marital leisure-time activity and cigarette smoking, alcohol consumption, and mental wellbeing. Four chronic disease studies concentrated on the physical activity of one or both spouses living with heart disease (Hong et al., 2005; Jenson, Suls, & Lemos, 2003; Macken et al., 2000; Weinman, Petrie, Sharpe, & Walker, 2000), and one study examined how diabetes impacted marital physical activity (Beverly & Wray, 2010).

Measurement. For the quantitative studies (or quantitative portion of mixed method studies), researchers mostly relied on self-reported measures of physical activity (n=13). A few studies (Ayotte et al., 2010; Juarbe et al., 2003; Raglin, 2001) reported both self report and objective measures (such as pedometer readings), and zero studies reported only objective measures.

Operationally, no two studies utilized the same scale to measure physical activity, and many studies used author-developed measures (Burke et al., 2002; Falba & Sindelar, 2008; Homish & Leonard, 2008; Jenson et al., 2003; Juarbe et al., 2003; Satariano et al., 2002; Weinman et al., 2000). Authors employed many different surveys such as the Baecke Questionnaire of Habitual Physical Activity (Hancher-Rauch & Hyner, 2005), the Modified Behavioral Risk Factor Surveillance System Survey (Macken et al., 2000), the Minnesota Leisure-time Physical Activity Assessment (Pettee et al., 2006), and the Self-Assessed General Health Status Survey (Wilson, 2002).

The majority of studies (n=9) presented validity coefficients for data from a previous study, while six studies contained no validity coefficients. Lewis, Butterfield, Darbes, and Johnston-Brooks (2004) were the only researchers to record testing validity coefficients for their own data. Over half of the studies (n=9) didn't report testing for reliability; four studies reported reliability coefficients from individual studies' data, and three cited published reliability coefficients from previous studies.

Study Design and Analysis. For quantitative studies, researchers relied heavily on cross-sectional data. In fact, 62 percent of these studies employed a cross-sectional design, and only 38 percent utilized a longitudinal design. Researchers were most likely to use multiple-regression to analyze data, with thirty-one percent recording bivariate statistics and only 25 percent utilizing multivariate statistics. 56 percent of studies didn't report effect sizes, but forty-four percent did report variance data such as Cohen's *d*, R^2, or eta^2.

For the qualitative studies, the most common design was basic qualitative with one article (Cedervall & Critina, 2010) designed as a case study. Researchers preferred to use in-depth interviews and small focus groups for data collection, and thematic or content analysis was the most common analytical method.

Qualitative Trustworthiness. The methodological quality of the three qualitative and two mixed studies was assessed using a table I created using standards outlined in Erlandson et al. (1993). I evaluated studies in terms of qualitative credibility, transferability, dependability, and confirmability as well as theory usage and sampling. The overall qualitative average score was 68.6% with studies scoring highest in

credibility, transferability, dependability, and sampling and lowest in theory usage and confirmability (see Appendix B).

All five studies utilized purposive sampling (or criterion-based selection) when selecting interview or focus group participants. For instance, Juarbe et al. (2003) outlined the selection criteria for sampling married Mexican immigrant women living in California. By establishing sampling criteria, qualitative researchers gleaned richer data about the phenomena of interest. According to Erlandson et al. (1993), credibility is enhanced by prolonged engagement, persistent observation, triangulation, peer debriefing, member checks and a reflexive journal. An impressive eighty percent of qualitative studies in this review established credibility using at least one of these naturalistic techniques. The most common ways to establish credibility were via member checks and prolonged engagement.

I recorded evidence of data transferability and dependability in eighty percent of reviewed studies. Researchers provided transferability by using "thick description," engaging in purposive sampling, taking extensive field notes, or transcribing interviews (Lincoln & Guba, 1985). Dependability was achieved with audit trails, coded transcripts, or reflexive journals.

While the majority of articles established methodological trustworthiness, forty percent of qualitative studies did not report any data confirmability (use of process notes, analysis products, or a confirmability audit trail). It is possible that researchers did establish undocumented data confirmability in these three studies, but these findings indicated a significant deficit in the reporting of qualitative trustworthiness.

Findings from Qualitative Data

Table 2. Qualitative findings

Factor	Descriptive themes	Impact on Physical Activity (P.A.)	Studies Reporting the Factor
Interpersonal	**Social Support**	Partners encouraged p.a. by using social support	#2, #3
		Lack of partner social support hindered p.a.	#7, #10
	Modeling	Modeling increased motivation for p.a.	#2
	Collective Motivation	Collective lack of motivation hindered exercise behavior	#2
	Health Reinforcement	Partners reinforced positive exercise behavior	#3, #4
Intrapersonal	**Responsibility**	Partners who believed that exercising would increase longevity and quality of life demonstrated increased p.a.	#2
Environmental	**Occupational Impact**	Spouses who work in heavy labor industries were less likely to engage in recreational p.a.	#12
	Perceived Barriers	Chronic disease by one spouse was a barrier to p.a.	#4
Cultural	**Perceptions and Values**	Belief that p.a. leads to physical image that is culturally incongruent with motherhood or upset the balance of internal energy (chi) hindered p.a.	#7, #12
	Gender Roles	Gender role expectations such as caring for the family hindered spouses from engaging in exercise	#7, #10

The fifteen qualitative findings appear in Table 2 and consist of the emergent themes or categories gleaned from the five qualitative/mixed methods papers. While one study indicated findings associated with the *collective* impact of the relationship on a couple's *collective* physical activity, the majority of qualitative studies examined how the marital context influenced individual behavior. In one study, the shared belief that exercising leads to increased longevity (potentially lessening the time spent as a widower) increased couples' physical activity (Beverly & Wray, 2010); yet in two studies (Juarbe et al., 2003; Raglin, 2001), the lack of spousal social support resulted in lower physical activity levels in married individuals.

Researchers found health reinforcement in the form of spousal encouragement to continue exercising as an emergent theme in Burke et al. (2002), and reinforcement as exercising together to be an emergent theme in Cedervall and Critina, 2010. Two other themes having a positive influence on spousal physical activity were modeling and collective responsibility (Beverly & Wray, 2010). Watching a partner exercise increased partner motivation to be physically active; a couples' collective responsibility to maintain good health throughout a lifetime increased physical activity.

The most common qualitative theme, social support, had both a positive and negative impact on activity. Verbal spousal support such as encouragement and praise reinforced physical activity in two studies (Beverly & Wray, 2010; Burke et al., 2002), yet lack of social support or "support" perceived as nagging was identified as a hindrance (especially for husbands) (Juarbe et al., 2003; Raglin, 2001). Raglin referred to positive support as "enhanced social support" (p. 361). In that particular study,

enhanced social support was characterized as positive verbal support or encouraging non-verbal support such as watching children while the other spouse exercised.

Authors cited cultural values and gender role expectations for Mexican women as a barrier to physical activity (Juarbe et al., 2003). Women in the study associated physical activity with promiscuity (an image incongruent with the cultural expectations of motherhood). Another barrier for these women was the expectation for women to be the primary caretakers for their husbands and children (thus leaving less time to be active).

Findings from Quantitative Data

Of the reviewed studies utilizing quantitative data, I determined the most common finding to be a statistically significant association between one partner's physical activity behavior and the other partner's (i.e. health concordance). While concordance studies don't identify *why* couples are similar or dissimilar regarding physical activity, the remaining findings did highlight aspects of marriage which influenced physical activity (see Table 3).

Table 3. Inferential findings

Factors influencing physical activity of married individuals	Direction of Relationship	Studies Reporting the Factor
Interpersonal Factors		
Social Support	+	#9 (W/H), #5 (W/H)
Exercising Together	+	#10 (W/H)
Spousal Physical Activity	+	#14 (W), #15 (W/H)
Intrapersonal Factors		
Self-Efficacy	+	#1 (W/H), #3 (W/H)
Self-Regulatory Behavior	+	#1 (W/H)
Belief in value of physical activity	+	#18 (W/H)
Environmental Factors		
Education	+	#8 (W), #15 (W), #16 (W/H)
Children	-	#15 (W)
Income	+	#16 (H)
Perceived Barriers	-	#3 (W/H)
Cultural Factors		
Cultural Perceptions & Values	-	#7 (W)
Health Concordance	+	#8 (W/H), #13 (W/H), #15 (W/H), #16 (W/H), #17 (W/H) , #19 (W/H)

W= Wife **H**= Husband **W/H**= Both Wives and Husbands
*Note: W/H indicates wives and husbands, but necessarily spousal pairs. For example, some studies surveyed married women and/or married men but didn't sample the spouses of study participants.

Five studies reported interpersonal factors such as social support, exercising together, and modeling (i.e. viewing a spouse being active). While social support and exercising together were positively associated with physical activity and/or exercise in couples, married women in two studies were especially influenced by having an exercising spouse (Jurj et al., 2006; Homish & Leonard, 2008).

Along with interpersonal factors, intrapersonal characteristics were also positively associated with exercise and/or physical activity. Self-efficacy, self-regulatory behavior, and personal beliefs concerning the value of physical activity were each statistically associated with high physical activity levels in couples (Ayotte et al., 2010; Burke et al., 2002; Weinman et al., 2000).

Four studies reported on various environmental factors such as education, number of children, average yearly income, and perceived barriers. Higher levels of education among women were positively associated with more exercise, while number of children had a negative impact (Homish & Leonard, 2008). For men, higher income was associated with higher levels of physical activity (Pettee et al., 2006).

Finally, cultural perceptions and values had a negative influence on female physical activity in one study (Juarbe et al., 2003). The most common barrier to wives' physical activity was husbands' lack of support due to a cultural belief linking exercising to looking "sexy" and promiscuous and/or the misbelief that exercise can damage female reproductive organs.

In addition to inferential findings, two studies also reported descriptive statistics (see Table 4). One study found that married female cardiac rehabilitation patients expended more energy than married male patients (Jenson et al., 2003). Women reported increased energy expenditure (especially in domestic activity) due to role expectations to be homemakers. While an increase in activity was encouraged, cardiac rehabilitation patients who expended too much energy too quickly following surgery risked complications.

Table 4. Descriptive (non-inferential) findings

Factors influencing physical activity	Findings	Studies Reporting Factor
Role Expectations	Married women recovering from cardiovascular surgery expended more energy than married men	#6 (W)
Social Control	Most frequent health behavior husbands were trying to get their wives to change was exercising more; 3rd most frequent for wives	#11 (W/H)

Lewis et al. (2004) examined the impact of marital social control on health outcomes and reported the most frequent health behavior husbands attempted to change in their wives was exercising more. However, exercising more was only the third most frequent health behavior women tried to change in men. Women were more likely to use social control to persuade their husbands' to eat healthy food or see a physician.

DISCUSSION

The six marital concordance studies in this review each demonstrated 100% physical activity concordance (similarity) amongst married couples. These findings support Meyler et al. (2007), who reviewed nineteen articles concerning marital similarity in health behavior. Of nineteen articles spanning twenty-six years, authors found 100% concordance. Also, Tams and Moum (1992) and Jurj et al. (2006) each sampled over 25,000 couples; both studies indicated strong concordance in spousal cardiovascular health. With such clear evidence supporting concordance, it is unclear why the field continues to research the existence of similarity amongst married

individuals. Does concordance exist? Research overwhelmingly suggests that it does. Thus, the more fruitful questions may be *why* are couples so similar and *how* do they influence the mechanisms underlying concordance. The scope of this review doesn't extend to why couples are concordant regarding health behavior, but I did uncover a number of ways spouses influenced the physical activity of one another.

For one, social support matters. This review identified support as an important tool for increasing physical activity. However, the absence of support or "support" couched as criticism/nagging was detrimental. Kiecolt-Glaser and Newton (2001) also mentioned this finding in a review focused on marriage and general health. The Kiecolt-Glaser and Newton piece divided support into three categories: confiding-emotional support, practical support, and negative support. That review found that negative support was a powerful predictor of negative health behaviors (including low levels of physical activity). Similarly, Trost, Owen, Bauman, Sallis, and Brown (2002) conducted a systematic review examining the determinants of physical activity among adults. Researchers noted a positive association between social support from spouse/family and increased physical activity. Thus, both the current review and previous reviews highlight the importance of support. Social support *matters*, especially in close interpersonal relationships such as a marriage.

Culture also matters. Several studies recorded the detrimental impact of cultural perceptions, values, and gender roles on physical activity in several studies (Juarbe et al., 2003; Raglin, 2001; Chun & Chesla, 2004). Especially for women, the culturally-determined gender expectations to be the primary caregiver for their children and

husband(s) hindered many from engaging in exercise. Eighty-nine percent of wives in Juarbe et al. mentioned husbands' and other family members' negative cultural perceptions and values as the most common barrier to physical activity. Women reported feeling guilty or selfish for taking time away from their families to exercise (Juarbe et al.; Raglin).

Along with gender roles, cultural perceptions impact physical activity. Mexican immigrant women cited the cultural idea that being physically fit presented an image incongruent with motherhood (i.e. a lean and "sexy" body) (Juarbe et al., 2003), and a group of Chinese immigrants noted the cultural perception that vigorous exercise may upset the delicate balance of internal energy (Chi) (Chun & Chesla, 2004). Trost et al. (2002) reviewed studies reporting on correlates of adult participation in physical activity. Researchers in that study found a strong association between social support and physical activity, but found a weak association between physical activity and cultural influences. This review suggests culture has a greater impact on the physical activity of couples than what was reported by Trost et al.

Environmental and biological factors also matter. This review demonstrates the power environmental influences have on spousal physical activity. For husbands, higher education and higher income positively impacted physical activity (Pettee et al., 2006); for wives, number of children negatively influenced activity (Homish & Leonard, 2008). Spouses possessing heavy labor jobs (Chun & Chesla, 2004) or perceiving environmental barriers to exercise (Burke et al., 2002) were less likely to engage in recreational physical activity. These findings connecting environmental factors with

activity levels support similar results from Trost et al. (2002). However, those authors emphasized tangible environmental factors such as urban vs. rural settings and enjoyable scenery. The studies in this review centered more on demographic variables which indirectly impact married individuals' environments. For instance, husbands possessing higher incomes may have been more physically active because they had more financial resources to join a gym or buy exercise equipment.

Finally, intrapersonal factors matter. Married individuals reported responsibility, self-efficacy, self-regulatory behavior, and belief in the value of physical activity as determinants of their physical activity. One qualitative theme, responsibility, was especially interesting. Married participants in Beverly and Wray (2010) indicated a strong responsibility for personal health due to the potential consequences of their poor health for their spouses (e.g. physical burden on other spouse, early death). Although recorded as an intrapersonal characteristic, this theme obviously pointed to a strong connection between intrapersonal characteristics and interpersonal relationships.

The three quantitative intrapersonal findings (self-efficacy, self-regulatory behavior, belief in the value of activity) all had positive associations with physical activity, yet the connection between these findings and the marital relationship was seldom examined in these reviewed studies. Does a spouse possess self-efficacy on her own or might her husband influence this? Do husbands who believe strongly in the value of exercise pass this value on to their wives? More research is clearly needed examining the potential mediating/moderating impact of one spouse on the intrapersonal characteristics of the other.

Along with identifying influences on married individuals' physical activity, this review contributes to the literature by including a methodological quality assessment of each study. To date, no systematic review concerning marital physical activity has included this type of assessment. By measuring methodology quality using a rubric, scholars can see trends, strengths, weaknesses, and deficiencies in this entire body of knowledge, some of which are discussed in the following suggestions for future research section.

Unlike similar reviews by Keicolt-Glaser and Newton (2001) and Meyler et al. (2007) that excluded qualitative findings, another unique feature of this review was the inclusion of qualitative data. Along with a review by Walker and Luszcz (2009) focusing on the health and relationship dynamics of late-life couples, this review included quantitative and qualitative data. By including qualitative (and the qualitative portion of mixed methods) studies, I present a richer and more detailed picture of how the marital context influences physical activity.

Implications for Practice

The findings of this review may have implications for health education practice. For one, practitioners need to understand the importance of targeting both partners in the marital dyad. This review highlighted the clear influence of spouses on one another's physical activity. The way spouses speak to one another and the type of social support they offer *matters*. Two important best practices for health educators may include emphasizing the detrimental effects of negative social support (i.e. nagging, sarcasm) and teaching spouses how to optimally utilize positive verbal support.

Additionally, physical activity interventions for married couples could include cultural sensitivity. By first understanding the cultural limitations and nuances of a particular group of individuals, health programs may be more successful at raising physical activity levels. A one-size-fits-all approach to physical activity interventions ignores the larger cultural milieu surrounding a marital dyad.

Suggestions for Future Research

Of the sixteen studies employing an implicit or explicit theoretical framework, study authors utilized nine different theoretical perspectives. Health Concordance Theory emerged as the most utilized theory, yet the wide range of perspectives is an indication that this body of knowledge lacks a cohesive theoretical understanding.

While no study used Bertalanffy's General Systems Theory (1967) as a framework, it may be an excellent way to conceptualize how the marital context influences physical activity, as well as how a couple's cultural and environmental contexts impact activity. Bertalanffy theorized that every person is a system nested within larger familial, cultural, environmental, and organizational systems. Since marriage is between two people, the marital "system" may influence each component of the larger system. Additionally, the larger cultural and environmental systems in which couples operate may synergistically add to this influence. The interpersonal, environmental, and cultural factors highlighted in this review all point to a need for a systems-level perspective (Goodson, 2010).

The methodological quality scores addressed both deficiencies and excellence in this body of literature. While all five qualitative studies utilized purposive sampling,

only sixty percent recorded evidence of data transferability, dependability, or confirmability. Future qualitative studies should utilize and report the use of reflexive journals and dependability/confirmability audit trails.

Regarding the quantitative studies, researchers excelled at presenting some type of explicit or implicit theory, yet future studies need to report validity and reliability coefficients for original data (Thompson, 2006). Additionally, more longitudinal studies utilizing both self-report and objective measures in tandem are needed. By conducting longitudinal studies, researchers can gain a better understand of physical activity over time rather than a one-time snapshot such as a cross-sectional survey.

This review emphasizes the call for more studies targeted at healthy couples. Over twenty percent of the reviewed studies were conducted with couples or individuals living with chronic disease. While it is critically important to understand the role marriage may play in the physical activity behavior of cardiac rehabilitation or diabetes patients, to focus exclusively on couples adapting to a chronic disease or surgery reveals little about marital influence on physical activity in otherwise healthy couples.

Finally, more culturally diverse samples are needed. Findings from this study indicate the importance of culturally determined values, perception, and gender role expectations on the physical activity of married individuals. However, a mere three of nineteen sampled studies focused on these issues. Why did only three of nineteen sampled studies include cultural determinants? If health educators had a better understanding of how cultural values and perceptions impact physical activity within the context of marriage, more culturally sensitive interventions could be designed.

Limitations

The current literature review contributes to the body of knowledge concerning the link between marriage and physical activity, yet I note several limitations. First, this review included only heterosexual married couples. In excluding other sexual orientations and individuals in cohabitating relationships, this review failed to give a full picture of how physical activity is impacted in the range of intimate relationships. Since a 2004 CDC survey indicated married and cohabitating couples don't share similar health outcomes, it will be important for future studies to focus exclusively on cohabitating couples.

While the criteria I used for the quantitative methodological assessment of reviewed studies is well documented (Buhi & Goodson, 2007; Zhang & Goodson, 2011), the qualitative methodological assessment was created specifically for this review. As such, my assessment hasn't been sufficiently scrutinized and may be intrinsically biased. That said, I followed the citied guidelines of Lincoln and Guba (1985) and Erlandson et al. (1993) to determine the criteria for what constitutes an excellent qualitative study.

Despite the noted limitations, this review contributes a detailed picture of the current status of the body of knowledge concerning the physical activity determinants within the marital context. Additionally, the inclusion of qualitative data and an assessment of the methodological quality of quantitative, qualitative, and mixed methods studies gives an excellent overview of the overall quality of these studies.

CHAPTER III

MR & MRS: HOW 'I DO' INFLUENCES PHYSICAL ACTIVITY: A SOCIAL COGNITIVE APPROACH

INTRODUCTION

After saying "I do," married individuals begin tangibly and intangibly fusing their lives together. Couples merge personal libraries, bank accounts, sometimes even last names. Couples may also merge more intangible concepts such as family backgrounds, life goals, and career aspirations. This merging, along with the close physical nature of the relationship, inevitably influences each spouse in a multitude of ways. Married individuals may find themselves watching new television programs, taking up different hobbies, switching political parties, even stopping detrimental habits all because of the influence of their spouse.

However, spousal influence is often subtle and varied. Was it what a husband said that influenced his wife to stop smoking or how he said it? Did a wife take up chess after repeatedly seeing her husband playing with her daughter or because her husband continually asked her to do so? Was it the words of a wife that gave her husband confidence to attain his college degree or a new policy at his work offering tuition assistance? In other words, is it what someone says (verbal persuasion) or what someone sees (modeling) or something else (e.g. environmental factors) which influence behavior? While it would be impossible for one paper to explore the spousal influence on all dimensions of the marital relationship, this study sought to investigate one aspect: physical activity behavior.

Research indicates a clear spousal influence on *health*, yet an ambiguous influence on physical activity, specifically. According to a survey conducted by the Centers for Disease Control and Prevention (2004): "The association between marital status and *health* is striking…and persists throughout the age groups" (emphasis mine, p. 1). Falba and Sindelar (2008) investigated the power of marriage partners to change negative health behaviors and found when one spouse changed a poor health behavior, the other spouse was likely to change behavior as well. Researchers stated: "Spouses have important impacts on each other, and we have shown that this influence extends to *health* behavior" (emphasis mine, p. 113).

Research, however, is mixed regarding spousal influence on physical activity. In a study with newly married couples, Craig (1990) found that marriage coincided with *decreasing* exercise levels for both spouses. After two years of marriage, wives' exercise decreased from two times per week (on average) to one; husbands' exercise lowered from two to three times per week to one to two times per week. Craig and Truswell (1988) documented a decline in exercise for both men and women after marriage. Yet, other studies show a *positive* correlation between marriage and physical activity. According to the CDC (2004), "Married adults are less likely to be physically *inactive* than unmarried adults" (emphasis mine, p. 1). Turner and Marino (1994) concluded social support within marriage raised physical activity levels. Studies by Waite (1995) and Waite and Gallagher (2000) revealed married people *more* active than unmarried.

Statement of Purpose

Due to such varying reports, the influential relationship between marriage and physical activity is unclear. Why *does* physical activity increase in some marriages and decrease in others? What about the relationship between two people influences whether activity levels raise or lower? More specifically, what are the mechanisms influencing physical activity in a marital context? After conducting a two-year study examining physical activity in married individuals, Hull et al. (2010) concluded, "Current literature is ambiguous as to how marriage impacts physical activity" (p. 577). Due to this ambiguity, the overarching purpose of this study was to answer this central question: *How does the marital context influence physical activity in spouses?*

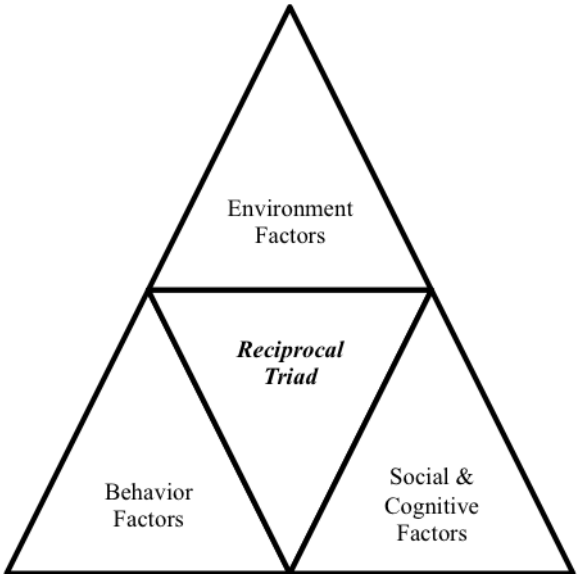
Theoretical Framework

Bandura's Social Cognitive Theory (SCT) (1989) provides a theoretical lens through which the relationship between marriage and physical activity can be better understood. Not only does SCT "provide a useful framework for understanding physical activity" (Rogers et al., 2005 p. 807), it is ideal for studying how social environments (such as marriage) impact cognition.

SCT works under the assumption that "people don't live their lives in social isolation" (Bandura, 1989, p. 449). Instead, Bandura (1986) understands human functioning as an interactive dialogue between behavior, cognitive and social factors, and environmental influences. This continual, dynamic occurrence is called the "reciprocal triad" (see Figure 1) and flows from the assertion that these forces engage in

a “cognitive dialogue” that determines human behavior. It would logically follow that a significant change to one of the three aspects of the triad could radically alter the others.

Figure 1. Social cognitive triad



Marriage alters not just one, but all three points of this triad. Marriage changes the physical *environment*: couples move in together, sometimes moving to a different area of the country. Married couples also experience different *personal/cognitive factors* than befor: now spouses must consider the needs and wants of another person. Marriage impacts *behavior*: a man who had never swung a golf club may take up the sport his wife begins teaching him.

Self-Efficacy

The goal of this study was to better understand spousal influence on a specific *behavior*: physical activity. In keeping with the concept of the reciprocal triad, Bandura predicts environment and cognitive/personal factors could both help determine behavior. However, SCT works under the premise that the influence of these two points is not equivalent. Instead, Bandura (1986) states that behavior is largely dictated by a personal factor called self-efficacy.

Bandura (1986) defines self-efficacy as the belief in one's confidence to perform a given behavior. In that text, he described an individuals' self-efficacy as the "*single most powerful* personal characteristic determining behavior change" (p. 134, emphasis mine). He later added, "Among the mechanisms of personal agency, none is more central or pervasive than people's beliefs about their capabilities to exercise control over their lives" (Bandura, 1989, p. 1176).

SCT predicts spouses have the capacity to impact the other partner's self-efficacy in two ways: verbal persuasion and vicarious modeling. According to Bandura (1989), "People who are persuaded verbally that they possess the capabilities to master given tasks are more likely to mobilize greater sustained effort, than if they harbor self-doubts and dwell on personal deficiencies when difficulties arise" (p. 400). Thus, a spouse's sustained persuasion could possibly alter the other person's self-efficacy. A five-mile-a-day runner may eventually persuade his wife that she *can* complete a morning run.

However, men and women view verbal persuasion differently. In a study by Umberson (1992), scholars researched the social control of health behavior in marriage.

Researchers defined social control as telling, reminding, or threatening others in order to promote a positive health behavior (like exercise) or to deter negative health behavior (like smoking). Women were far more likely to control men's health than vice versa. While one might think that men would reject this kind of control, Umberson concluded that men perceived this as protective and nurturing.

In the above example, men viewed persuasion as a nurturing act of care and concern. However, if a husband continually "persuades" his wife to go to the gym, might she view this as an indirect slight about her body? Similarly, would a man eventually tire of his wife's repeated cajoling to be more physically active? Could he interpret this as nagging and thus be less inclined to give into her wishes? To answer these questions, the first specific objective of this study was to: *gain a better understanding of how verbal persuasion influences physical activity self-efficacy in married individuals.*

Along with verbal persuasion, modeling may influence self-efficacy. Bandura predicts the modeling of one spouse as influential in altering the thoughts and subsequent actions of the other spouse. As Bandura (1986) stated, "Vicarious influence greatly expands the sphere of influence of social reward in promoting standards of excellence" (p. 370). If a man observes his wife beginning to exercise consistently and simultaneously exhibiting a more energetic disposition, he may begin to think he could also exercise and enjoy similar outcomes. Since physical activity modeling within marriage isn't clearly understood, the second specific objective of this study was to: *explore if/how modeling impacts spousal self-efficacy regarding physical activity.*

Due to the design of this project being flexible and open, I left room for other questions and theoretical perspectives to emerge. For example, how might environmental factors such as children, work schedules, and/or climate influence physical activity? To this end, the third objective of this study was to: *investigate what other factors may influence physical activity for married couples.*

METHODS

To answer the research objectives, I employed a basic qualitative research design. I distributed flyers in a mid-sized Texas city to gain research participants, then I conducted hour-long interviews in participant homes. In order to reduce spousal bias, couples were interviewed separately. I collected data semi-structured intensive interviews, observational notes, and photo elicitation (see Appendix C & D) after receiving approval from the Institutional Review Board (see Appendix E). While the first two methods are well documented in qualitative literature (Lincoln & Guba, 1985), photo elicitation is a relatively under-utilized research technique.

Introduced in 1967 by Collier, photo elicitation is the process of first asking research participants to take photos of a phenomenon of interest prior to an interview, and then having them describe why they chose to take certain photos. Photo elicitation presents an "intimate photographic account of family culture" (Collier, p. 51) that uniquely describes and communicates lived experiences (Clark-Ibanez, 2004). Photo elicitation "mines deeper shafts into a different part of human consciousness than do words-alone interviews" (Clark-Ibanez, p. 1513).

I chose to use Collier's photo elicitation rather than Wang's photo-voice technique because this study didn't attempt to "give voice" to marginalized people or groups (Wang & Burris, 1994). Though similar, the main purpose of photo-voice is to bring about social change and social justice, whereas photo-elicitation is simply meant to elicit deeper responses than mere words alone. To learn more about photo-voice, please see Wang and Burris (1994).

Prior to the interview, I contacted participants and asked each person to take two or three pictures representing how his or her marriage influences physical activity. Additionally, I asked participants to think critically about why they took those pictures. To begin the intensive interview, participants described the pictures they created. I then coded the photos in the same manner as the remainder of the interview. I interviewed each participant separately to minimize spousal bias. Additionally, I assigned participants pseudonyms to ensure confidentiality.

Sampling Criteria

For participant selection, I utilized snowball (or network) purposive sampling. The purpose of this type of sampling is to first identify key informants who meet search criteria, then ask those individuals for names of other people who share the phenomena of interest (Merriam, 2009). Snowballing was the ideal strategy because married individuals knew other couples that were ideal study participants.

I based my selection criteria on the theoretical framework and literature review. The first criterion was marriage. While the influence of cohabitating couples on physical activity habits may be significant, empirical data from the 2004 Centers for Disease

Control and Prevention survey on marriage and health showed married and cohabiting couples do not share similar health outcomes. Thus, this study narrowed the sample selection to married individuals. Second, I chose both partners for this sample due to the gender differences regarding how men and women perceive verbal persuasion and modeling. Findings from Fernandez-Ballesteros, Diez-Nicolas, Caprara, Barbaranelli, and Bandura (2002) indicated there is most likely a gender and age difference regarding efficacious beliefs. Third, the sample included couples representing different stages within marriage: early marriage (couples married 0-5 years), mid-marriage (couples married 6-20 years), and late marriage (couples married 21 or more years).

In order for the sample to be similar in racial makeup to the state of Texas, U. S. Census data guided the purposive sampling. According to the 2010 Census, 70.4% of Texans are white, 37% are Hispanic, 11.8% are Black or African American, and 3.8% are Asian (United States Census, 2010). Thus, I strove to maintain these ratios in my sample.

Data Analysis

After I transcribed the interviews verbatim, I employed the constant comparative method to guide the analysis (Glaser & Strauss, 1967). First, I reviewed each interview and photograph keeping in mind the purpose and research questions. I then open coded relevant data for potential themes or categories. For photographs, I coded both the photo itself and what participants commented about the photo. I placed the pieces of coded data from both the interviews and photos into potential categories and subcategories. After that, the analysis from the first interview guided the coding for the subsequent

transcripts. Next, I conducted a round of axial coding to narrow and refine categories. This type of coding was more reflective and conceptual than merely descriptive open coding (Merriam, 2009). Axial coding helped create abstractions from the data to ensure that categories were interpretive and reflexive. Finally, I determined the overall themes and subthemes using a number of trustworthy documents (see below).

Trustworthy Documents

For the purpose of triangulation, I gathered data from three sources: observation notes, interview transcripts, and participant photos. To ensure the credibility of the findings, I created a peer-debriefing memo with a list of participant demographic variables and potential categories. An independent reviewer then reviewed these categories to ensure validity of the data. To maintain dependability, I organized interview data into an audit trial to trace the original data back to the extrapolated categories. According to Erlandson et al. (1993), these types of documents ensured the rigor, dependability, and transferability of research findings.

FINDINGS

The study sample consisted of twelve couples (twenty-four individuals) representing a wide range of marital duration length, education, number of children, and ethnicities. I coded forty-five photographs and over seventy-five pages single-spaced interview transcripts. A summary of participant data is presented in Table 5.

Table 5. Participant table

Couple	Length of Time Married	Education	Children	Ethnicity	Marital Context
Robin (30) **Marcus (33)**	2 yrs	High School Undergraduate	0 0	African-American African-American	Robin is in retail sales, and Marcus is a football coach at a local high school
Angel (29) **Eric (28)**	Less than 1 yr	Graduate Undergraduate	0 0	Hispanic Hispanic	Angel works long hours as a graduate student, and Eric stays fit due to his job as a personal trainer
Shannon (46) **Cory (45)**	23 yrs	Undergraduate Undergraduate	3 (ages 17, 20, 22)	Caucasian Caucasian	Cory stays busy running an at-home software company, and Shannon is an elementary teacher
Maria (31) **Nicolas (31)**	3 yrs	Undergraduate Graduate	1 (age 4)	Hispanic Hispanic	Marco and Maria live apart due to work situations; they value spending time with their son
Julie (60) **Michael (63)**	36 yrs	Graduate Graduate	2 (ages 29, 33)	Caucasian Native American	Julie and Michael are retired and very active; they enjoy spending time with grandchildren
Brandy (31) **Jacob (32)**	8 yrs	High School High School	2 (ages 1, 3)	Caucasian Caucasian	Brandy and Jacob struggle to make ends meet due to limited vocational opportunities; Brandy stays at home
Olivia (57) **Daniel (57)**	28 yrs	Undergraduate High School	3 (ages 21, 25, 27)	Caucasian Caucasian	Olivia is hoping to retire from teaching this year, while Daniel loves his job as a sound engineer
Liz (38) **James (37)**	5 yrs	Graduate Graduate	1 (age 1)	Hispanic Hispanic	James and Liz have very high powered, stressful careers; they struggle to find time for exercise

Table 5. Continued

Couple	Length of Time Married	Education	Children	Ethnicity	Marital Context
Claire (23) **Jude (22)**	Less than 1 yr	Undergraduate High School	0 0	Caucasian Hispanic	Claire and Jude met at the gym, and they are both very physically fit
Molly (61) **Derrick (60)**	41 yrs	High School Graduate	4 (ages 22, 24, 28, 31)	Caucasian Hispanic	While Derrick is still very active, Molly's arthritis makes it difficult to exercise; they raised four adopted children
Noel (28) **Josh (33)**	10 yrs	Graduate Undergraduate	3 (ages 1, 2, 4)	Caucasian Caucasian	Noel and Josh lead a very hectic life trying to raise three children under 5; the children take up all the couple's free time
Savannah (48) **George (52)**	17 yrs	Graduate Undergraduate	2 (ages 8, 13)	Caucasian Caucasian	Savannah is a tenure-track professor, and George is a commercial realtor; they both know they should exercise, but don't know when they would find time
Avg length of marriage:	15.48	**Ethnicity of Sample:** Caucasian: 54% Hispanic: 33% African-American: 8% Other: > 4%			

The themes gleaned from the data are presented *in vivo*. I organized themes according to the original study objectives: (a) gain a better understanding of how verbal persuasion influences physical activity self-efficacy, (b) explore if/how modeling impacts spousal self-efficacy regarding physical activity, and (c) investigate what other factors may influence physical activity for married couples.

In keeping with the Social Cognitive framework, the findings of the first two objectives corresponded to the behavioral component of the SCT reciprocal triad, while

additional findings for the latter objective corresponded to the other two points of the triangle, environmental and social/cognitive factors (see Figure 2).

Figure 2. Findings triad

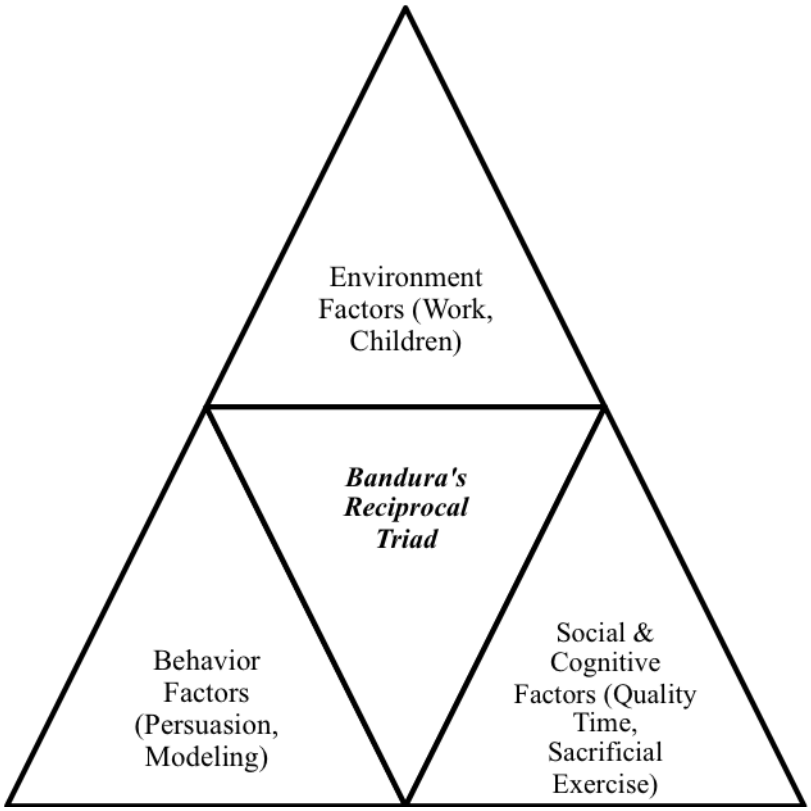


Table 6. Summary of themes

Theme	Subtheme	Exemplary Quote	SCT Aspect
1) "When she goes, she doesn't even have to ask" (Modeling)	n/a	*"Just by example, he keeps a good routine of exercise"*	Behavior
2) "You are going to feel better" (Persuasion)	n/a	*"When I don't feel like it, he tells me I will feel better afterwards"*	Behavior
3) "So many distractions"	"My job consumes me" (Work) "My child *is* my activity" (Children)	*"The biggest reason we quit has to do with work"* *"I am always chasing kids around"*	Environment
4) "We feed off each other"	"We enjoy the quality time" (Quality Time) "It is more for her" (Sacrificial Exercise)	*"I just like being with him"* *"When we are active, it is really for her"*	Social/ Cognitive

"When She Goes, She Doesn't Even Have to Ask"

Seven spousal pairs and two other husbands (n=16) commented on modeling, making it the most cited theme (see Table 6). Spousal pairs reported the mutually beneficial effect of modeling. Jude expressed, "When I see Claire getting ready to go work out, I take that as a sign that it is time to go the gym." Claire indicated modeling as a motivating factor for her as well with her comment, "Jude is always working out so I see that and want to keep up with him." Michael and Julie also referred to modeling. Julie told the story of the summer Michael decided to take swimming lessons at age

thirty-six. She said, “I took them with him because I didn’t want to be left out, and I wanted to encourage him.” Michael stated Julie’s modeling influence on his physical activity, “My wife rides her bike all the time. I don’t go with her every time, but I see her and want to go too. I think I wouldn’t ride as much if she didn’t.” For these couples, mutual modeling helped establish regular exercise habits. As one spouse observed the other exercise (or prepare to exercise), he or she was motivated to engage in a similar activity.

Men, in particular, reported a tendency to positively react to modeling. Nine of twelve husbands in this sample indicated a desire to exercise if they saw their wife exercise or prepare to exercise. Eric said, “When she goes to the gym, she doesn’t even have to ask.” Josh claimed, “When I see Noel getting ready to go run or something, I usually go too.” These findings in conjunction with the negative impact of nagging indicate that husbands in this sample prefer modeling over verbal persuasion (which can be perceived as nagging).

While verbal persuasion and modeling greatly influenced motivation and behavior, only a few participants indicated a change in confidence (i.e. self-efficacy). When I asked “How might your spouse influence your confidence to be consistently active?” a number of spouses claimed little influence. Nicolas insisted, “There is little my wife could do to raise or lower my confidence to exercise. I mean, I have always been active. I know I can do it.” James added, “She couldn’t do much to change my belief in my ability to work out. I love working out and being active, I know I can be.”

Thus, spousal modeling and persuasion seemed to alter motivation, more than *confidence* to be active.

"You Are Going to Feel Better"

Not only what spouses *observed*, but also what spouses *said* impacted physical activity. The use of verbal persuasion by husbands emerged as the second most cited theme. Ten of twelve wives said their spouses encouraged them to be active for personal, emotional, and psychological benefits. Angel, a hardworking graduate student, asserted, "Eric will suggest I go work out to take a break from working so hard. Another wife, Robin, echoed a similar idea, "My husband motivates me to work out and to push myself a little harder. Marcus will say to me 'you are going to feel better if you do,' and I believe him. That is motivating."

However, not all wives perceived persuasion from husbands as beneficial. Robin said this:

> My husband will comment that I have more energy when I exercise. Marcus also says it helps me feel better physically. That is motivating. But sometimes…(pause)… he will tell me I need to work out to get a little more toned (points to thigh) that doesn't always go over very well (rolls eyes).

Her sarcastic tone and facial expression revealed Robin's irritation. For Robin, her husband's use of extrinsic motivation (referencing her physique) discouraged her. Noel, the mother of three small children, asserted "If Josh were to say I was gaining too much weight or that I should go work out that would NOT work for me; that would cause problems." Claire, a newly wed, affirmed Noel's remarks, "If Jude told me I *had to* be active that would hurt my feelings… (pause)...I would wonder if he was saying I

looked out of shape." These women perceived intrinsic motivation (i.e. increased energy and happiness) as encouragement, and extrinsic motivation (such as a more toned appearance) as discouraging.

Wives often spoke to the motivating (or de-motivating) impact of verbal communication with their husbands. However, when asked if husbands increased *confidence* to be physically active, only three wives affirmed the link between positive verbal persuasion and increased self-efficacy. Janet said her husband "definitely increased her confidence to be active" because of his encouraging words. Robin also said, "Marcus does build [her] confidence" because he "tells me what exercise does for me."

While husbands tended to use the promise of emotional and/or physical benefits to motivate wives to exercise, wives (n=6) encouraged exercise in order to gain quality time together or to convince their husbands to be their accountability partner. Brandy, a stay-at-home mother, mentioned this when she said she asks her husband to go walking with her and her two girls not only to be healthier, but also to spend more family time together. Olivia, an active elementary teacher, said, "I try to tell Daniel we should walk. If he would do it with me, I would walk every night. I like walking, but I *really* like being together."

Even more than the desire for quality time, a fourth of wives persuaded their spouses to exercise together in the hopes that their husbands would help them be accountable to physical activity. Cory, a computer programmer, related, "Shannon tries to say we should be healthier together; she tries to get us to do things together partly

because it helps her to be active." Shannon confirmed Cory's statement, "Exercising is not something I am motivated to do myself. I need him to motivate me." Robin and Marcus possessed a similar dynamic in their relationship. She told him it is difficult for her to work out by herself, yet he would often exercise without Robin due to the couples' conflicting work schedules. Marcus said, "She always likes to exercise together; I think she likes the built-in motivation."

Husbands mentioned their wives used verbal persuasion to increase quality time together, not necessarily to increase husbands' confidence to be physically active. In fact, when asked "what things might your wife do or say to influence your confidence to be physically active," several husbands said "very little" or "not much."

Interestingly, participants commented that verbal persuasion also *lowered* spousal physical activity. Forceful, continuous "encouragement" was often viewed as nagging by a participant's spouse (especially by men). Half of the husbands spoke to this type of persuasion. Daniel, a man married for almost thirty years, said, "We have been married so long, I can tell when she gets that nagging voice. I don't like it when she nags me. I can handle a little pushing, but not nagging. That wouldn't encourage me to be active." Jacob added, "If she kept asking and asking me about it, I probably wouldn't like it. I guess it would depend on her tone." James said, "She can suggest I work out, but she sometimes crosses a line into nagging." When I asked about tone or this line, husbands said when wives used terms like "have to" or "should" in a domineering tone, it persuaded them not to be active. George said what works for him is when his wife includes herself or when she encourages him to work out for his own enjoyment.

Along with a particular type of communication (i.e. nagging), spouses also lowered partner physical activity by discouraging overexertion. Every spouse in their forties, fifties, and sixties reported instances in which one partner discouraged activity due to the risk of injury or the existence of a health condition. Since Molly was diagnosed with rheumatoid arthritis several years ago, Derrick will often tell her to "slow down a little if [her] arthritis is flaring up." Michael, a man in his sixties, also said his wife tells him to "take it easy and not overdo it." While discouraging physical activity seems counter-intuitive, spouses over forty actually encouraged wellness by urging one another to avoid injury or overexertion.

Finally, a few spouses discouraged exercise due to time restraints. Cory, an avid runner, said that Shannon discourages him from entering or training for marathons because of the time commitment required for these races. Liz also lamented she wishes her husband didn't play baseball as often, because it "takes away from family time."

"So Many Distractions"

The next main theme captured the environmental factors which enabled and/or hindered physical activity. While a few spouses mentioned internet surfing (n=1) and television viewing (n=2) as environmental influences, participants most frequently cited work (n=21) and children (n=15).

"My Job Consumes Me." Husbands and wives equally referenced work schedules and active jobs as barriers to activity. Robin used a photograph to tell the story of her work demands (see Figure 3). She explained: "I work a lot. I put my dress shoes in the middle and my tennis shoes to the side to represent my priorities. I would like to

exercise more, but I am exhausted from work." For Robin, lack of free time and work demands presented barriers to activity. Her husband, Marcus, echoed her, "…with my work schedule, I am just ready to get home. I am exhausted." Nicolas took a picture of a road sign to represent his lengthy work commute. He added, "It is tough to be active with having such a crazy schedule. I am on the road too much" (see Figure 4). Savannah, a mathematics professor, pronounced her life was "like a roller coaster" and "there is a correlation between down times and being more active."

Figure 3. Shoes

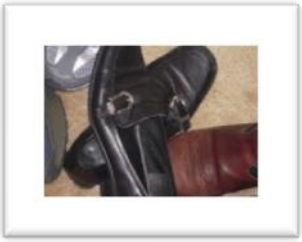


Figure 4. Sign

Work hindered couples from being active individually and jointly. Even though I interviewed couples separately, both husbands and wives in five spousal pairs mentioned the challenge of managing joint physical activity while working full time. Savannah stated, "We use to be more active together but the biggest reason we quit was work commitments and different schedules. We would like to be active together, but life is crazy." George, Savannah's husband, said, "Her work and my work have opposite

schedules so we just can't work out together." Noel, mother of three, disclosed her desire to be active with her husband, but said that "schedules conflict," and their joint physical activity "has so much to do with schedules, especially work schedules." Noel's husband, Josh, affirmed, "Work plus having children means we rarely get to the gym together."

"My Child is My Activity." As stated by Josh, children presented another environmental influence on marital physical activity. However, unlike the overwhelmingly negative impact of work, participants viewed having children as both positively and negatively impacting physical activity.

Every mother (n=9) and a few fathers (n=3) mentioned an increase in activity following the birth of their children. Brandy, mother of two small girls said, "When they are little you are always chasing them everywhere." James took a picture of a jogging stroller and explained, "This represents how much we walk around the neighborhood with our son" (see Figure 5). Molly, mother of four grown children, recalled her days as a young mother and said she was "definitely more active" when she had children.

Figure 5. Stroller

Spouses reporting low to moderate physical activity before having children were especially likely to perceive an increase in activity after kids. Maria took a picture of her four year old and emphatically stated "He *is* my physical activity." Explaining her lack of athleticism and activity, Maria said, "I have never really like sports, but I am much more active after having my son. We take him swimming and to the park." Olivia shared, "having kids raised my physical activity. I was a little sedentary before, but when you have kids it is like forced physical activity."

While frequency of activity increased, four wives and three husbands also noted a decline in intensity. This was particularly true for participants who claimed to have been moderately to highly active before having children. Brandy lamented, "I still feel active, but I also feel like I need to be going to the gym more. I wish I could run as much as I did." Josh said, "We walk with the kids and go to the park, but it isn't exactly a workout." Cory, a marathon runner, remarked, "One of the biggest gaps in physical activity for both of us was when our kids were little."

Along with a decline in activity intensity, parents mentioned a decline in activity due to lack of time (n=3), fatigue (n=5), and physical limitations of children to engage in rigorous activity (n=3). Liz, an associate professor, said, "When our son was born, that changed our activity. There are things we just couldn't do together with him." Noel stated, "With this last child, it is a struggle to do anything… each kid has made it harder and harder and I have done less and less. I am exhausted."

"We Feed Off Each Other"

The final main theme centered on cognitive and social factors. How spouses related with one another on an interpersonal level directly impacted the way participants thought about activity and vice versa. The theme "It is a head game" was broken down into two subthemes; "We enjoy the quality time," highlighted the social motivation of being active together, and "It is more for her" described sacrificial exercise.

"We Enjoy the Quality Time." The emotional component of engaging in activities together was a strong emergent theme. Four husbands and seven wives indicated the dual benefit of being active together. Claire said, "We work out together so that we can be physically fit, but also have time together." Angel captured this idea in a photo she took of her and her husbands' hands (see Figure 6). She described her picture by saying:

> The hands just represent togetherness. Anything we do together is good. That is more motivating for me. It symbolizes that we are in this together…I enjoy walking because I like talking to Eric. I feel like I have his undivided attention. I don't feel like I am exercising, I feel like I am enjoying my husband.

Figure 6. Hands

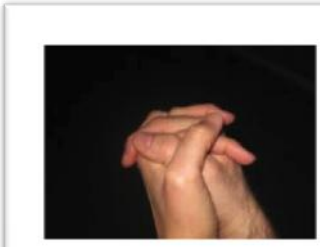


Figure 7. Walking

Men as well as women felt that quality time due to exercising together was beneficial for their bodies as well as their marriages. Michael's photo depicted him and his wife at an area park and stated, "One of the things we do together is go for a walk. Many times that leads to deeper conversation. That gets rid of all distractions" (see Figure 7). James stated emphatically, "Being active together takes your relationship to another level." Daniel added, "I feel closer to Olivia when we are doing things together."

"It is More for Her." While quality time was a major social motivator for both husbands and wives, eight participants related that husbands often engage in activity for their wives' sake (not necessarily because they themselves enjoyed or felt that they benefited from an activity). I labeled this kind of activity "sacrificial." Marcus and Cory mentioned exercising with their wives because they enjoyed the quality time and loved their wives, but they didn't physically benefit from the activity because of a mismatch in physical ability. Marcus said,

> When we exercise together, it is more for her as opposed to me. I like to run and lift weights; she likes to do more low impact things like walking. So, when I exercise with her, I don't get a very good workout, it is for her. We walk because she likes to walk. I love her, so I go with her.

Shannon explained her husband, Cory, will play tennis with her, but then will often run three miles after they finish playing. "He doesn't really say anything, but that bugs me. You just know you are unevenly paired," lamented Shannon. Cory said, "I like doing things with her, but I usually need to do higher level activity." Daniel suggested his wife isn't "at the same level as [him] physically" because they are "sort of physically mismatched." Olivia reported that she appreciated David walking with her in the

evenings, but knew it was only for her. She suggested she would be more motivated to walk if Daniel enjoyed and benefited from the exercise to the same degree.

DISCUSSION

The first two objectives of this study examined if and how verbal persuasion and vicarious modeling influence married individual's self-efficacy to be physically active. In keeping with the Social Cognitive Triad, participants cited verbal persuasion and modeling as influencing behavior. The themes "You are going to feel better" and "When she goes, she doesn't even have to ask" captured these thoughts. The third objective, to investigate how the other two parts of the SCT triad (environmental and social/cognitive factors) influence behavior, was contained within the themes "So many distractions" and "It is a head game."

Regarding the first objective, verbal persuasion (especially intrinsic motivation) encouraged wives. While a few husbands alluded to external motivation such as an improved appearance, most husbands encouraged their wives by referring to a better emotional or mental state. Wives perceived this type of persuasion as positive, and many reported an increase in motivation to be active. Additionally, a small number of wives stated an increase in self-confidence from their husbands' use of verbal persuasion.

On the other hand, husbands perceived *excessive* verbal persuasion by wives as nagging and counterproductive. A few husbands reported a slight increase in *motivation* if their wives used a small amount of persuasion; none said persuasion increased *confidence* to be physically active. Raglin (2001) reported similar findings after

interviewing thirty married individuals enrolled in an exercise program. Men in that study responded negatively to verbal persuasion by wives because they felt it was nagging and disrespectful. These findings regarding communication depart from Umberson (1992). Umberson found husbands perceived verbal persuasion by wives as protective and nurturing.

Taken together, it appears that verbal persuasion in this sample increased motivation for wives and husbands (to a lesser degree), yet had little impact on confidence (i.e. self-efficacy). A few wives reported increased confidence, but no husbands felt that persuasion increased their ability to be active. These findings indicate a slight departure from how verbal persuasion is meant to operate within Social Cognitive Theory. Within the SCT framework, self-efficacy and motivation are one in the same. However, this sample differentiated between these two concepts.

According to Bandura (2000), verbal persuasion raises self-efficacy, which then alters behavior. Bandura theorizes self-efficacy is the *single most important* determinant of behavior because it mediates the relationship between persuasion and behavior. Yet in this sample, verbal persuasion impacted *motivation* which then altered behavior.

Ryan and Deci (2000) developed Self-Determination Theory by emphasizing the importance of motivation in driving human behavior. Ryan and Deci stated motivation has the power to alter behavior by influencing a person's interest, excitement or confidence (i.e. self-efficacy). Authors referred to self-efficacy as one factor among others that may be influenced by motivation. Similar to Ryan and Deci's Self-Determination Theory, the findings of this study concerning verbal persuasion point to

an increase in motivation, which *may* influence self-efficacy, yet self-efficacy doesn't appear to be the single mediator between what spouses said and consequent behavior change. Instead, verbal persuasion increased motivation which then increased interest, excitement, *or* confidence (self-efficacy).

Interestingly, many older individuals in this study utilized verbal persuasion to *discourage* spouses from overexertion or unsafe physical activity. Couples instead supported each other by encouraging age-appropriate levels of exercise. This type of persuasion served as a type of protective behavior and demonstrated a mutual caring. These findings concur with Beverly and Wray (2010) who found that couples living with diabetes felt a collective responsibility to encourage one another to be healthy and engage in appropriate levels of activity. My findings, in conjunction with Beverly and Wray's findings, suggest couples possess a collective responsibility to care for one another and this responsibility extends to physical activity. As physical activity levels adjust with time, it would be appropriate for spousal verbal support to adjust accordingly.

The second objective, concerning the role of modeling, was cited by three-fourths of study participants. Men, especially, reported the positive impact of modeling. Unlike verbal persuasion which men often perceived as nagging or critical, nine of twelve men said modeling spurred exercise or intention to exercise. While less influential for women, modeling motivated half of sampled wives to at least consider being active with their husbands (if not join them).

These findings support Beverly and Wray (2010) who interviewed thirty couples to investigate how marriage influences exercise behavior in diabetes patients and spouses. Husbands and wives from that study indicated modeling as a strong motivator for physical activity. Observing each other continue the exercise regime motivated spouses to continue the program.

According to Bandura (1986), vicarious modeling alters behavior due to a model being rewarded or punished. However, spouses in this study mimicked each other's actions due to close proximity and the desire for quality time, not necessarily because one spouse was rewarded or punished for completing the action. Thus, participants responded to modeling, not necessarily *vicarious* modeling. One explanation for this could be differing fitness goals. Many men desire to build muscle mass whereas women generally seek to lose weight and tone muscles. Since women may not want to gain excess muscle mass and men may not want to lose weight, what is considered a "reward" by each sex is most likely different.

Raglin (2001) followed thirty married individuals enrolled in an exercise program alone and thirty-two married individuals enrolled in the same program without their spouse. Results of that study indicated couples who completed the program in tandem were more *motivated* to continue than those engaged in the program alone. Also, Beverly and Wray (2010) recorded a connection between spousal modeling and motivation. Participants indicated modeling as increasing *motivation* for physical activity, and collective lack of *motivation* as hindering exercise. These articles and the

findings from this study suggest modeling, like verbal persuasion, increases motivation, not necessarily confidence (i.e. self-efficacy).

The last objective, to investigate other influences determining physical activity, revealed the strong influence of environmental and social/cognitive factors on these marriages. Participants reported work as a unilateral negative environmental influence, whereas children tended to increase frequency of activity yet decrease exercise intensity. These findings may give clues as to why literature is unclear whether marriage increases or decreases physical activity. While not every marital couple has children, it is common for a couple to bear children relatively soon after getting married. Participants claiming low to very low activity levels before having children indicated an increase in activity after. However, those parents who were moderate to highly active before kids suggested a decline in activity afterwards, especially in exercise intensity. Does activity increase or decrease after marriage? Findings from this study would indicate *both.*

Lastly, participants noted the desire for quality time together as a strong social factor motivating activity. While this finding is fairly intuitive, the existence of "sacrificial" exercise was an unexpected social factor. A few husbands reported engaging in activity for the sake of their wives. At first glance, this appears positive, yet wives in these marriages felt inadequate and frustrated that their husbands were participating in exercise yet were not really enjoying the activity for themselves. It is unclear if this type of sacrificial exercise is actually constructive in the long term. To the best of my knowledge, no study to date has focused on the impact of "sacrificial

exercise." More research in this area is needed to adequately investigate how exercising for the sake of a spouse impacts both partners in the marital dyad.

Implications for Practice

Although generalizability in the statistical sense is not possible in qualitative literature (Merriam, 2009), I have attempted to use "thick description" and purposive sampling to enhance data transferability or the possibility of these findings "transferring" to another setting (Lincoln & Guba, 1985).

While not context-dependent, the findings of this study may have notable implications for the field of Health Education. Findings from this study suggest the power of marriage to impact the physical activity habits of both partners. Thus, instead of designing programs for individuals alone, health educators may need to create programs specifically tailored to married couples. Incorporating both spouses in a single intervention may yield greater results than engaging only one part of the marital dyad. In the words of a husband in this study, exercise works best "when it is a plural thing."

Educators also might work to better understand how verbal persuasion and modeling operate within marriage. Practitioners could then design programs to educate partners in the best ways to talk to one another about encouraging activity. Similarly, a greater emphasis could be placed on the positive impact of modeling. While cliché, the adage "actions speak louder than words" may be appropriate in this context.

Limitations

One limitation of this study was the assumption of the value of exercise. It was necessary to sample individuals who had some interest in or knowledge of exercise in

order to elicit responses to interview questions concerning physical activity. While our participants represented a variety of physical activity levels, most were at *least* low to moderately active. However, many Americans have extremely low levels of activity. Data compiled by the Centers for Disease Control and Prevention from the Behavioral Risk Factor Surveillance System (2007), reveal only 48.8% of Americans get the recommended amount of physical activity, 37.7% get insufficient amounts, and 24.1% get no leisure-time activity. By interviewing participants who regularly participated in some form of physical activity, an inherent assumption of the value of exercise was present in this sample.

While this sample was ethnically diverse, it lacked diversity in terms of the age of participants' children: only one couple had children ages seven to thirteen. Future studies need to focus on couples with children in these middle years. Because kids this age often have numerous extra-curricular activities, it is unclear how couples manage their own schedules in conjunction with their children's schedules while trying to stay active.

Also, I conducted this study in a mid-sized Texas city. It is possible that couples living in various areas of the country may report different environmental influences such as weather and access to green space. By narrowing this study to only one city, I may not have achieved a full picture of how marriage affects physical activity in different environmental contexts.

Finally, the sample included only married, heterosexual unions. By excluding cohabitating couples as well as couples from various sexual orientations, I failed to

sample individuals involved in each aspect of the spectrum of intimate relationships. I chose my criteria due to a 2004 survey by the Centers for Disease Control and Prevention that showed different health outcomes for married vs. cohabitating adults as well as heterosexual vs. homosexual adults.

While several limitations were noted, this study does make important contributions to the field of marital physical activity behavior. Marriage is a complex, highly influential relationship and this influence extends to exercise/physical activity. This sample reported limited verbal persuasion, modeling, and having children as positive determinants to behavior, while work demands, nagging, and exercising for the sake of the other partner as negative determinants. These findings support the notion that marital influence is not unidirectional, but rather a synergistic, reflexive dyad.

CHAPTER IV

THE TIES THAT BIND: A SYSTEMS PERSPECTIVE TO UNDERSTANDING MARITAL PHYSICAL ACTIVITY

INTRODUCTION

Famous French film actress, Simone Signoret, once remarked, "Chains do not hold a marriage together. It is threads, hundreds of tiny threads, which sew people together." Married couples share a multitude of "threads" such as core values and common life goals, even children for some. It is these threads which serve to unite a couple into a common unit, to "sew" them together. While each partner is an independent person, the marital context uniquely binds two people together, forming an integrated intangible structure, a *system*.

Psychologists Cox and Paley (1997) support this idea of a marriage being "its own system" and "like any system is dynamic, open to constant revision, and constantly influenced by and influencing other systems" (p. 257). Thus, not only do "tiny threads" sew each marital partner together, but the other structures (i.e. systems) surrounding the pair also connect to the couple. For example, the larger cultural context surrounding a pair may greatly influence everything from what a couple buys for dinner to what television programs they watch to how often they see their extended families. However, unlike the immovable "chains" referenced in the Signoret quote, the threads tying the couple together as a type of system *and* the threads connecting the couple to the

surrounding environmental, organizational, and cultural systems are flexible and constantly forming new connections.

Research indicates one such "thread" connecting the marital unit is physical activity behavior. For example, Falba and Sindelar (2008) used data drawn from the Health and Retirement Study to examine older married couples' influence on each other's health behavior, including physical activity. These researchers documented a health intervention 'spillover effect' (p. 112): when one spouse changed a poor health behavior, this caused a spillover effect in the other. This spillover also served to unite the couples in changing their physical activity habits. At the conclusion of the article, Falba and Sindelar recommended future health education interventions that aim to increase couples' physical activity should provide explicit details of how to assist an individual's spouse in changing his or her health behavior in order for the couple as a whole to be healthier. The researchers emphatically stated, "Although studies have analyzed spousal influence, they have typically evaluated the behavioral change of one spouse and taken the other spouse's behavior as fixed" (p. 96).

In another setting, Homish and Leonard (2008) conducted a longitudinal study in which 634 couples assessed the impact of one partner's health behavior on the other. Scholars in that study found a significant association between wives' and husbands' exercise habits through the first four years of marriage as well as a statistically significant association between husbands' premarital exercise and wives' exercise habits over time. Homish and Leonard suggested, "Understanding how partners influence one

another's health behavior is important for health promotion and intervention efforts" (p. 754).

According to these previous studies, partners connect to each other in important ways regarding physical activity. Research also supports the idea that marital systems are threaded to and influenced by the other systems surrounding the marital dyad. Juarbe et al. (2003) conducted a qualitative study with married female Mexican immigrants and highlighted the impact the cultural system had on the sample. Scholars in that study found women associated physical activity with promiscuity, an image incongruent with the cultural expectations of motherhood. Juarbe et al. also identified women's expectation to be the primary caretaker for their husbands and children as another cultural barrier to physical activity.

Along with the cultural system, the occupational system is joined to and exerts influence on the physical activity habits of married individuals. Pettee et al. (2006) conducted a survey with 345 spousal pairs and found married men with higher-paying jobs were more active than men with lower-paying jobs. Authors stated one reason for this disparity could be less access to exercise equipment and facilities. Similarly, Chun & Chelsa (2004) conducted a study with twenty-four married diabetic patients and concluded individuals with jobs involving heavy labor were less likely to engage in formal exercise/physical activity than those working in sedentary jobs.

Statement of Purpose

While the physical activity habits of married individuals may be impacted by the marital system itself and other broader systems, many studies focusing on marriage and

physical activity habits are quantitative in nature (Hong et al., 2005; Jenson et al., 2003; Juarbe et al., 2003; Jurj et al., 2006). Quantitative studies, however, do not ask open-ended questions. For example, how do the other systems "threaded" to a marital dyad influence physical activity? What do spouses say or do that impacts behavior within the marital system? What raises or lowers physical activity levels in a marriage? How tightly sewn are these threads that bind these systems together? I wanted to explore these concepts, and therefore I chose a qualitative design. Due to the need for more research in this area, the purpose of this article was to answer the following questions: *How does the marital system influence the physical activity habits of each partner? How do the other systems containing the marital union (i.e. cultural, occupational, and familial) influence the physical activity behavior of spouses?*

Theoretical Framework

Given the "threads" connecting a couple to one another, as well as the "threads" connecting a couple to the larger familial, cultural, and occupational systems, it is important not only to focus exclusively on the small parts comprising the various systems, but also consider systems on a broader, more holistic level. To this end, I utilized Bertalanffy's General Systems Theory (GST) to guide this study.

Ludwig von Bertalanffy published his seminal work on GST in 1967. He theorized each individual person is a system living and working within other systems (i.e. the family system, social system, governmental system). For Bertalanffy, to understand any system, one has to look beyond the parts or elements which make up the system. Just as a symphony's collective 'voice' is greater than the individual

instruments, so too a system is not simply a multitude of isolated parts tied together, but a new entity entirely.

While Bertalanffy's theory was first applied to biology, the theory has also been used in various other academic fields. For the purpose of this project, I chose McGarry's Family System principles to help ground the theory in this particular context. McGarry (2002) offers four principles derived from Bertalanffy's theory which guided my understanding of the family (or couple) as a system: (a) The Wholeness Principle, (b) The Principle of Levels of Organization, (c) The Principle of Interdependence, and (d) Requisite Variety. The Wholeness Principle states a whole is greater than the sum of its parts. As argued earlier, a marriage isn't just two people living separately, but in tandem; a marriage is a new system which is greater than each individual person. The Levels of Organization Principle encourages the study of a system from higher, holistic levels rather than only examining lower levels such as the individuals composing a system. The Principle of Interdependence works with the notion that no part of a system is independent. This is similar to Cox and Paley's (1997) assertion: "Individual family members are necessarily interdependent, exerting continuous and reciprocal influence on one another" (p. 246). Lastly, Requisite Variety states a system has to be flexible and diverse in order to sustain itself and adapt with environmental changes.

While systems theory doesn't have a consistent language or set of core constructs (Best, Moor, Holmes, & Clark, 2003), thus making operationalization difficult, McGarry's principles are useful for describing and interpreting how the marital system impacts spousal physical activity. For example, if a study participant relies on her

husband to watch their newborn son while she swims on a Saturday morning, the Principle of Interdependence gives clues as to how the marital system accommodates physical activity. According to Prest and Protinsky (1993), "Each member of a system exists as an individual, but is integrally connected with the other members of his or her family" (p. 76). A concept map of systems theory in the context of a marriage is presented in Appendix F.

METHODS

The methods for this project are presented in detail in Chapter III. Thus, the information presented below is a synopsis of the original explanation presented in the aforementioned article.

I conducted this study in a mid-sized Texas city using two different qualitative methods: semi-structured intensive interviews and photo-elicitation. While interviewing is well understood by qualitative scholars, few studies utilize photo-elicitation. Distinct from Wang's photo-voice technique (Wang & Burris, 1994), photo-elicitation is meant to elicit deeper responses than mere words alone, not "give voice" to individuals for the purpose of social justice.

Collier introduced photo-elicitation in 1967 to give an intimate account of family culture (p. 51) and to describe lived experiences (Clark-Ibanez, 2004). Harper (2002) stated three ways photo elicitation contribute to the understanding of participants' lives: (a) photographs are visual inventories of objects, people, and environments, (b) photos depict events that are part of collective or institutional paths (i.e. schools, work places),

and (c) photos are intimate dimensions of the social. Harper argued that photo elicitation "produces a different kind of information" (p. 13, emphasis mine).

Prior to an interview, I sent photo-elicitation instructions to each participant describing the procedures for taking two or three pictures of how his or her marriage may impact exercise or physical activity behavior. I then began each interview asking participants why they chose each photograph. I coded the photos in the same manner as the remainder of the interview.

Sampling Criteria

To gain research participants, I employed network purposive sampling. My criteria were threefold. First, each couple must have been in a heterosexual marriage married. I chose this parameter due to empirical data from a 2004 Centers for Disease Control and Prevention survey highlighting the differing health outcomes of married versus cohabitating as well as heterosexual versus homosexual couples. Second, I chose to interview both partners (male and female) because Fernandez-Ballesteros et al. (2002) indicated there is most likely a gender and age difference regarding physical activity behavior. Each spouse was interviewed separately to minimize bias. Third, I included only individuals living in the United States due to limitations in study feasibility.

In order for the sample to be similar in racial makeup to the state of Texas, U. S. Census data guided the purposive sampling. According to the 2010 Census, 70.4 % of Texans are white, 37 % are Hispanic, 11.8% are Black or African American, and 3.8 % are Asian (United States Census, 2010). Thus, I strove to maintain these ratios in my sample.

After transcribing the interviews verbatim, I utilized the constant comparative method to guide the data analysis (Glaser & Strauss, 1967). I first engaged in a round of open coding to glean potential themes. Next, I conducted a round of axial coding keeping in mind study objectives and the theoretical framework. Axial coding helped create abstractions from the data to ensure that themes were reflexive and interpretive. Finally, I enhanced the credibility of my themes and subthemes using trustworthy documents.

For the purpose of triangulation, I gathered data from three sources: observation notes, interview transcripts, and participant photos. Throughout the investigation, I kept a reflective journal and created various peer debriefing memos and audit trails. According to Erlandson et al., these documents ensured the confirmability, dependability, credibility and transferability of research findings (1993).

FINDINGS

The pictures, words, and ideas from twenty-four diverse individuals (twelve couples) comprised the research data. Couples varied in number of children, ethnicity, background, education, and marital length. I concluded sampling after reaching saturation with seventy-five single-spaced pages of interview transcripts and forty-five photographs. Participant data are presented in table form in Chapter III.

I presented the main themes and subthemes from my data *in vivo* (Latin for "within the living") because I felt the comments by participants powerfully encompassed each theme. I organized these themes or categories according to the theoretical

framework and McGarry's four systems theory principles: 1) Wholeness Principle (the whole is greater than the sum of its parts), 2) Levels of Organization (nesting of systems within other systems), 3) Interdependence (no part of a system is independent), and 4) Requisite Variety (a system adapts to environmental changes). The themes are presented in Table 7.

Table 7. Summary of main themes

Theme	Subtheme	Exemplary Quote	GST Principle
1) "It all comes full circle" (Multigenerational influence)		*"My dad was super active so I am too… I want that for my boy, too"*	Wholeness Principle
2) "Our culture has certain expectations" (Cultural influence)	"You are supposed to sacrifice for your husband and kids" (Gender Roles)	*"After you marry, your needs come second to your husband and kids"*	Levels of Organization
	"Skinny models are the standard of beauty" (Body Image)	*"I feel the pressure to be thin"*	
3) "We feel connected"		*"We feed off each other"*	Interdependence
4) "Life changes and so do we"		*"Our work, our kids, shoot even the dog make a difference in terms of our activity"*	Requisite Variety

“It All Comes Full Circle”

The first main theme encompassed the idea that the marital systems in this sample are nested within and influenced by larger familial systems such as a couples’ extended family (especially the parents of participants). How a participant was raised and the example their parents set both individually and collectively *mattered*. Interestingly, many couples with children reported the desire to be a positive influence on them (or future children). Thus, the image of concentric circles beginning with the children of participants, extending to participants, and then expanding to include the larger familial system (parents of participants) captured the first theme: “It all comes full circle.”

Three wives and six husbands reported mimicking their own parents’ habits. Nicolas related how his father was a professional baseball player, so he himself is active because he was exposed to this model during his youth. Derrick said his father was a professional athlete, and he grew up always throwing footballs and baseballs with his dad. Jude recounted that his father was a “big time weight lifter who was constantly active” and so as an adult he is “just like [his] father.”

If both parents of both marital partners in this sample were active, those couples tended to both enjoy and regularly participate in joint activity. Eric remembered both his parents were constantly active and especially “loved dancing together… the salsa, merengue, other Latin dances.” His wife, Angel, remarked, “My parents were always pretty active. I grew up thinking exercise was just part of everyday life.” Eric and his wife both reported moderate to high activity levels as adult married individuals.

Similarly, Jude and Claire said they grew up in active families in which both parents exercised. Therefore, the couple regularly participated in physical activity.

Participants also tended to mimic low parental activity. Molly stated, “My mom wasn’t active at all. My mom was sedentary like me.” Shannon recounted, “My mom didn’t really exercise when we were growing up. I think she is like me.” Four women and one man reported similar modeling behavior. Clearly, the parents of the married individuals in this sample greatly influenced both individual and couple physical activity habits.

While the extended family demonstrated great influence on these spouses, participants (especially fathers) voiced a desire to positively impact the physical activity of their children. Nicolas passionately described “wanting to be a good role model” for his son and “wanting to show him how important it is to be healthy.” Nicolas said it was one of the biggest priorities for him as a father. Likewise, Jacob said, “We are doing our girls a service to stay healthy. We do want to teach them that.” James echoed other fathers by saying, “It is important for a family to be healthy. I want to model that to our son.”

The first main theme related to wholeness in that the extended family of a couple (i.e. parents) impacted spousal physical activity. Additionally, the marital systems in this sample exerted influence on their smaller, nuclear family system (i.e. a couple and their children).

"Our Culture Has Certain Expectations"

The second main theme gleaned from participant data related to the larger cultural system. Spouses recounted numerous examples of cultural expectations, obligations, and influences that impact physical activity habits. Keeping with the second GST principle, Levels of Organization, each marital dyad was nested within greater levels of organization. Similar to the concentric circles of a bulls' eye, couples were part of greater familial, then organizational, then cultural systems. This particular theme focused on the cultural system.

I created two subthemes within this main theme: "You are supposed to sacrifice for your husband and kids," and "Skinny models are the standard of beauty." The first subtheme related to female gender roles and expectations, and the latter described the culturally determined "ideal" sense of beauty. While the scope of this paper is limited to physical activity, for participants in this sample (especially women), body image was intrinsically tied to physical activity.

"You Are Supposed to Sacrifice for Your Husband and Kids." My interview protocol included asking married individuals to describe how culture may influence physical activity habits. Interestingly, each Hispanic woman and one Hispanic man commented on the gender roles and expectations for women as a potential barrier for physical activity.

Maria, mother of a four-year-old son, asserted, "When you get married, you sacrifice for your kids and husband. They are first. Your needs and working out comes second." She also stated, "In the Hispanic culture, the woman is the one who takes care

of the kids." Her husband Nicolas echoed her thoughts by saying Hispanic women are generally tasked with taking sole responsibility for the children. He said, "We have a term for it, called *marianismo* or "being like the Virgin Mary"… my wife is very *marianismo*. She is motherly, selfless, submissive, and sacrificial." The concept of *marianismo* was crucial to understanding the cultural mechanisms influencing the Hispanic men and women in this sample. If a woman was to be sacrificial and the sole caregiver, it would follow that she would have less time for any personal pursuits (such as physical activity or exercise). Although Angel isn't a mother herself, she made this statement:

> I don't think anyone really verbalizes it, but I do think there is more pressure regarding your social and gender roles ... then say, what a white woman feels. In the Hispanic culture, women are expected to be the primary caregiver. My cousin is married to a *machismo* man. She tries to go work out, but her husband is annoyed that he has to care for their baby. He always asks when she is coming back and complains. Not all Hispanic men are like that, but I see it.

Liz said many other Hispanic women feel that they can't work out because it is seen as selfish. Her husband, James, stated, "I think in our culture, there is a traditional mind set of gender roles. Maybe some Hispanic men wouldn't like their wives leaving to go work out because they wouldn't be available for the kids." While Hispanic participants had much to say about gender roles and expectations, a few also said that although they understand concepts such as *marianismo* and *machisimo*, they don't necessarily subscribe to those cultural principles themselves. For example, James claimed he "wasn't the typical Hispanic guy" and "he definitely encourages his wife to be active."

"Skinny Models Are the Standard of Beauty." Along with the Hispanic culture, participants (especially white females) linked the American cultural ideal of the perfect female form to physical activity habits. While seemingly removed from the idea of physical activity or exercise behavior, seven women named the culturally determined ideal of the perfect female body as a motivator for physical activity.

Figure 8. Jeans

Brandy highlighted this concept with a picture of her jeans (see Figure 8). She explained the three pairs all represent the various jeans she has worn before, during, and after pregnancy. Brandy described the smallest pair, a size four, as her motivation for increasing her activity. She stated, "I think it is a cultural thing. White women are supposed to be waif thin, and that is hard to live up to…but I try." Claire, a young white woman, echoed Brandy by admitting, "I always feel pressure to be thin. That is my chief motivation for exercise right now." Shannon said, "I feel the pressure to be thin like my other friends. I am vain, but I want to drop dress sizes. That is why I try to exercise."

In contrast to these white women, Angel, claimed, “I have never wanted to be super skinny and I feel zero pressure to be. In some ways, I am glad I am Hispanic, because I am held to a different standard than white women.” While the interview protocol included no questions regarding body image, over half of the female participants commented about physical activity and its relationship to body weight. Especially for white women, the cultural ideal of the “skinny model” was cited as the primary motivator for increased (or wanting to increase) physical activity.

“We Feel Connected.”

The third main theme described connectedness and highlighted the GST Principle of Interdependence. Since these marriage partners had close, daily contact with one another, it would follow that each part of a dyad was intrinsically linked to the other. Participants stated enjoyment of being active together and mutual verbal encouragement as positive influences on individual and couple exercise. Many couples demonstrated how one spouse was often interdependent with the other.

Marcus and Robin, a couple married only a few years, each spoke to sexual activity as a way to be active and enjoy the other person. In fact, Marcus took a picture of their bed and said, “Sex is a lot of physical activity for us. Honestly, that is the most frequent activity” (see Figure 9). Robin said sex was “a lot of fun” and most of their activity together.

Figure 9. Bed

Figure 10. Bike

While Marcus and Robin were the only two individuals candid enough to name sex as a primary form of physical activity, six wives and four husbands recorded enjoyment of an activity together as both a cause and outcome of joint exercise. Angel took a picture of a bicycle wheel and told of when her and her husband bought bikes together (see Figure 10). She said, “We would both ride our bikes around town and to the gym. It was really fun to be together and get outside.” James stated “being active together takes [our] relationship to another level,” and Nicolas asserted “spending time with Maria while being physically active is great.”

Along with enjoyment of activity, mutual encouragement demonstrated connectedness and interdependence between spouses. Four wives and three husbands commented on the power of verbal encouragement to spur physical activity. Robin said she and Marcus “influence each other” because exercise “is a mutual thing.” She stated, “We both have to encourage each other. We both feed off one another.” Molly, a reluctant exerciser, commented, “If I didn’t have him asking me to walk with him and encouraging me, I probably wouldn’t do it.” Eric, a personal trainer, asserted, “Physical

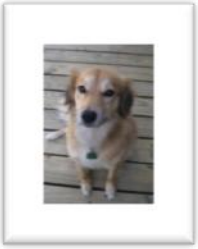
activity is more successful when we ask each other; I think we motivate and push each other."

"Life Changes, and So Do We."

As a final theme, participants identified ways the marital system adapted to various environmental changes such as pets, children, and careers. According to Bertalanffy, a system is flexible, diverse, and capable of adapting to change. Wives and husbands demonstrated numerous ways physical activity habits adapt to shifts in the environment.

Three spousal pairs (*n*=6) indicated an increase in joint physical activity after buying a dog. Shannon admonished that after they bought a dog, she and her husband "walk the dog every day" and their dog "keeps [them] walking." Cory also recorded this environmental change with a picture of their dog (see Figure 11) and the comment, "The dog motivates me and her." Derrick said, "We walk the dog nearly every day for forty-five minutes together. In a funny way, the dog kind of brings us together."

Figure 11. Dog



While the addition of a pet was unilaterally positive, the marital systems in this sample tended to vary in response to changes in career(s). After Maria's husband took a

job in the health and wellness industry, she said, “I learned so much from him. I would even watch his presentations. That really influenced what we eat, how much water we drink, and especially how active we are.” Following a change in careers, Noel took a job with a company that reimburses employees for going to the YMCA nine times per month. She commented, “That motivates us both to go. I think we would both slack off if it weren’t for that.”

Yet, other couples mentioned the detrimental impact of job changes. After taking a job as an assistant professor, Liz reported feeling guilty for spending so much time working and not with her family. She said she would “probably feel even worse if she took more time to exercise.” Liz also stated traveling for work as detrimental because then her husband has the brunt of the childcare, leaving both spouses less time for exercise. Brandy, a mother of two small girls, said her husband’s new job requires him to be gone for twelve hours each day. She stated, “He gets home and there is literally thirty minutes before the girls go down. If he got home sooner, I would be more active.”

Similar to career changes, how a marital dyad adapted to having a child varied. A few spouses commented on physical activity *intensity* decreasing after having kids, yet eight spouses described an increase in both exercise frequency and family time devoted to activity. Maria said, “We do things as a family because of our son like walking, skiing, swimming.” Julie recalled, “I started biking with my youngest child who was one year old. Shortly after that, we both bought bikes so we could ride.” Her husband, Michael, echoed his wife by saying they “tried to kill two birds with one stone” and “family time was also exercise time.” Thus, while intensity may have decreased for a

few parents, marital systems in the sample also positively adapted to children and thus, spouses reported an increase in frequency of physical activity.

DISCUSSION

The two primary purposes for this study were to examine how the "threads" of the marital system influence physical activity habits and to investigate how the other systems connected to the marital union (i.e. cultural, occupational, and familial) impact spousal physical activity behavior. Regarding the first purpose, the third theme "We feel connected" captured the concept of marital independence and the idea that couples influenced one another by "feeding off each other." Regarding the latter purpose, the first, second, and fourth themes all pointed to other systems influencing the marital dyads in this study.

The third theme, "We feel connected," highlighted the ways spouses positively influence each other within the marital system. Overwhelmingly, partners reported enjoying spending time together while being active and cited this as a chief motivator for activity. One couple even stated the enjoyment of sex as a benefit to being "active" in the bedroom. Along with enjoying each other, spouses were inclined to be physically active if their spouses used positive verbal persuasion. Thus, verbal persuasion was one thread tying the couple together that had a positive impact on activity.

The findings support research by Raglin (2001) and Beverly and Wray (2010). The Raglin study involved thirty married individuals enrolled in an exercise program alone and thirty-two married individuals enrolled with a spouse. Researchers in that

study found a positive association between exercising together and adherence to the program. Beverly and Wray used in-depth interviews to investigate the exercise habits of diabetic partners. Qualitative data revealed couples who felt that they were “connected” and “in it together” were more likely to be active individually and as a couple.

In relation to the second purpose, the larger cultural, occupational, and familial systems threaded to these couples greatly impacted these dyads. The first theme, “It all comes full circle,” suggested a generational loop in which the parents of these married individuals impacted them and thus participants desired to influence their own children. While not always positive, the parents of those in the sample modeled both exemplary and scant physical activity behavior. Consequently, participants with kids reported the desire to “pass on good habits” or “be a good example” because their parents either did or did not model these things.

Interestingly, the generational influences on physical activity aren’t generally the focus of a study. Instead, researchers often investigate the presence or number of children as a demographic factor alone. For instance, Homish and Leonard (2008) found a negative association between having children and female physical activity. Instead of asking binary questions (i.e. Do children raise or lower activity for women?), would a more insightful question be why or how do children impact activity? Future studies should focus on the specific ways children affect parental (and spousal) physical activity.

Along with the larger familial system, the cultural system(s) in which these couples live also affected activity. The Hispanic women in this sample cited the cultural expectation to be the primary care giver as a possible barrier to activity. Juarbe et al.

(2003) discovered a similar finding in a qualitative study conducted with Mexican immigrant women. Those researchers reported the cultural obligation to be the primary caretaker as a hindrance to physical activity for women in that sample.

Lastly, the final theme, "Life changes and so do we" highlighted the other environmental influences which played on these marital systems. Connected with the principle of Requisite Variety, changes in the environment such as the addition of children or pets or a change in jobs demanded the marital dyad adapt to these changes. While participants cited gaining a pet as a positive influence on joint and individual marital physical activity, children tended to raise exercise frequency yet lower intensity. Careers changes or work demands for one or both parts of a dyad also impacted the marital system. For example, participants cited long work hours and work travel as lowering physical activity.

These findings lend support to Bertalanffy's General Systems Theory (1967) and McGarry's family system principles. The Principle of Levels of Organization helped define the cultural, occupational, and familial systems that influenced the marital systems in this sample. Similarly, findings supported the Principle of Interdependence in that these marital dyads exerted great influence on one another. This was seen in couples speaking to the enjoyment of exercising together and lending positive verbal support to one another. Lastly, how these couples responded to changes in the environment such as pets, children, and career changes demonstrated the Principle of Requisite Variety. The threads connecting these marital systems to the greater environmental systems most definitely adapted to change and showed great flexibility.

However, the first principle, the Wholeness Principle, was somewhat vague. Though simple and obvious (i.e. a whole is greater than the sum of its parts), the principle is so general it was difficult to fully conceptualize this in relation to the data. As the name suggests, the theory is *general,* but is it a bit too general? Would it be more advantageous to isolate specific types of systems and narrow down constructs within particular systems? For example, McGarry's GST principles regarding families helped guide my inquiring. Yet, there are no set of GST principles or constructs to assist the understanding of health behavior, specifically physical activity. System principles for understanding health care systems and organizations are in place, but the field lacks systems principles for health behavior.

Implications for Practice

While the findings of this study are not generalizable, the findings do indicate a strong parental influence on the physical activity of this sample. For example, if a wife hadn't observed her mother regularly engaging in activity, she was unlikely to be an active person herself. Similarly, if a husband's father valued exercise, the husband generally did as well. Therefore, one possible implication for practice could be that health educators encourage couples to discuss their family backgrounds with one another. In so doing, health educators may assist couples in merging two invariably different familial backgrounds. Additionally, if a couple did decide to have children, this kind of intervention may help start a new tradition of wellness for future generations.

Limitations

I strove to maintain diversity in terms of age and ethnicity, yet this sample

included only one couple with children aged 7-13. While the focus of the study was on *marriage* not parenthood, future studies need to include children within these middle years. Unlike much younger or older children, parents with kids these ages often face the challenge of their children being in numerous extra-curricular activities. Parents, then, must juggle their own schedule with transporting their kids to these events. It is uncertain how parents in this life-stage find time for physical activity.

Another limitation of these findings was the assumption of the value of exercise. According to the Centers for Disease Control and Prevention (2007), 37.7% of Americans get insufficient amounts of physical activity and 24.1% engage in *no* physical activity. Our participants represented a variety of physical activity levels, but unlike the national average, most were at least low to moderately active. In order to elicit responses concerning physical activity, it was necessary to sample individuals who had some interest in or knowledge of exercise. By interviewing participants who regularly participated in some form of physical activity, an inherent assumption of the value of exercise was present in this sample.

This study set to understand the marital units as systems operating within other larger systems. It is obviously difficult to fully understand any system (couple in this case) after only one interview. Perhaps future qualitative studies may employ ethnographic methods to study how familial systems influence physical activity.

Lastly, this sample included only heterosexual, married couples. I chose my criteria due to a 2004 survey by the Centers for Disease Control and Prevention which

showed different health outcomes for married vs. cohabitating adults as well as heterosexual vs. homosexual adults. By excluding cohabitating couples as well as couples from various sexual orientations, I didn't sample individuals involved in every aspect of the spectrum of intimate relationships.

While I note several limitations, this study fulfills a distinct gap in literature. According to Falba and Sindelar (2008), there exists a significant deficit in the amount of studies investigating the impact of spouses on health behavior. This study examined how the threads within marital systems influence the physical activity habits of each partner. Additionally, this study demonstrated how the marital system(s) in this sample were tied to (and influenced by) familial, occupational, and organizational systems.

CHAPTER V

CONCLUSIONS

The driving question of this dissertation was: *How may the context of marriage influence spousal physical activity?* Specifically, what are the mechanisms that influence spousal activity or inactivity? This dissertation sought to address the "how" and "why" behind the relationship between spouses and activity levels. In order to examine gaps present in literature, I first conducted a systematic review of articles that were published in peer-reviewed, English language journals from 2000 to 2010 and sampled heterosexual married individuals. Based on the findings from the review, social support (or lack of support), culturally determined gender roles, environmental factors such as income level, and intrapersonal factors such as belief in the value of activity *matter* (see Chapter II). Additionally, numerous theoretical frameworks hinted to a lack of cohesive understanding as to the *how* marriage impacts activity.

The next chapter recorded a qualitative study that utilized Bandura's Social Cognitive Theory. Similar to the results of the systematic literature, participants in the study spoke to the importance of social support in motivating behavior change. Specifically, findings from Chapter III suggested the *way* spouses speak to each other is important. Participants who used intrinsic motivation versus extrinsic motivation were more successful at lending positive support. While verbal persuasion by husbands increased a few wives' sense of self-efficacy, the majority of women felt that persuasion increased *motivation*, not necessarily confidence.

Although the systematic literature review did not implicate modeling, findings from Chapter III also pointed to the power of modeling in impacting physical activity. In particular, husbands in this sample reacted more positively to modeling than persuasion. The existence of children and the desire for quality time also impacted spousal activity. Participants with children reported lower intensity exercise but higher frequency (see Chapter III).

The final chapter contained the same qualitative data at Chapter III, but I employed Bertalanffy's General Systems Theory to understand how the marital *system* influenced physical activity and/or exercise. Additionally, the theoretical perspective highlighted the influence of other, broader systems on the smaller marital microsystem. The findings revealed how the desire for increased quality time increased physical activity within these marital systems. Also, the larger cultural, occupational, and familial systems greatly impacted marital dyads. For example, white women reported the cultural pressure to maintain a thin physique as influencing activity. Three studies contained in the systematic literature review also demonstrated the importance of cultural perceptions and values regarding spousal physical activity. However, this final chapter also revealed findings that were not contained in the Chapters II or III such as how changes in the marital context (e.g. the addition of a dog, a new job) influence activity. Also, this final chapter recorded the desire of participants to "pass on" exemplary physical habits to their future children.

CONTRIBUTIONS TO LITERATURE

Each piece of this dissertation provides unique contributions to the extant literature concerning spousal physical activity. Regarding Chapter II, the creation of a methodological quality score assessment for *qualitative* articles was the first of its kind. Previously, scholars have not included qualitative data (or the qualitative portion of mixed methods studies) in systematic literature reviews. By creating a new rubric for this purpose, other scholars may be encouraged to include all types of data.

Second, the use of photo-elicitation is a unique qualitative method to glean richer data than words alone. While photo voice has been used extensively, photo-elicitation is still a rather underutilized qualitative method.

Lastly, the theoretical framework presented in Chapter VI, General Systems Theory, is just now gaining momentum in the field of Health Education. Although utilized heavily in sociology, biology, and health care administration, public health scholars and health educators are just beginning to take a systems theory approach to understanding health behavior.

IMPLICATIONS

The findings from these articles have significant implications for health education practice. This dissertation highlighted the clear influence of spouses on one another's physical activity. The way spouses speak to one another, the type of social support they offer, and what couples see each other doing *matters*. Three important best practices for health educators include emphasizing the detrimental effects of negative

social support (i.e. nagging, sarcasm), teaching spouses how to optimally utilize verbal support, and demonstrating the positive influence of modeling physical activity within marriage.

Additionally, physical activity interventions for married couples should perhaps include cultural sensitivity. By first understanding the cultural limitations and nuances of a particular group of individuals, health programs may be more successful at raising physical activity levels. A one-size-fits-all approach to physical activity interventions ignores the larger cultural milieu surrounding a marital system.

Finally, health educators could urge couples to discuss their family backgrounds with each other. The findings of this study indicate a strong parental influence on these couples' physical activity levels. By encouraging couples to discuss their upbringings and expectations regarding exercise, health educators could assist husbands and wives in merging their two backgrounds. Additionally, if a couple did decide to have children, this kind of intervention may help couples begin a new tradition for future generations.

RECOMMENDATIONS FOR FUTURE RESEARCH

Since this dissertation only examined married heterosexual couples, it will be important for future studies to delve into the full range of intimate partners. For example, how might cohabitating couples differ from married couples? Does something like verbal persuasion have a different influence in same-sex couples rather than heterosexual couples? How might spousal influence operate in couples in which one or both partners were previously married? This is an exciting field of study, and examining different

groups of intimate relationships may present a fuller picture of how partnerships impact physical activity.

Lastly, there were some surprising findings in this study that deserve fuller attention. For one, the concept of "sacrificial exercise" (seen in Chapter III) didn't appear in other chapters and isn't well understood. For spouses who exercise with their partners *only* for the sake of the other person, how might this sacrificial exercise impact the long-term physical activity habits for both individuals in the marital dyad? Additionally, each spouse over 50 reported using verbal persuasion to *lower* the physical activity of his or her partner. While encouraging safe, age-appropriate activity is important, could spouses over 50 be underestimating the capacity of their spouses to continue to engage in rigorous activity even at late ages? Future studies may focus on these and other significant questions.

REFERENCES

Ayotte, B. J., Margrett, J. A., & Hicks-Patrick, J. (2010). Physical activity in middle-aged and young-old adults: The roles of self-efficacy, barriers, outcome expectancies, self-regulatory behaviors and social support. *Journal of Health Psychology, 15*(2), 173-185.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory.* Englewood Cliffs, NJ: Prentice Hall.

Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist, 44*(2), 1175-1184.

Bandura, A. (2000). Exercise of human agency through collective efficacy. *Current Directions in Psychological Science,* 9, 75-78.

Bener, A., Zirie, M., & Al-Rikabi, A. (2005). Genetics, obesity, and environmental risk factors associated with type 2 diabetes. *Croatian Medical Journal, 46*(2), 302-307.

Bertalanffy, L. (1967). *Robots, men and minds*. New York, NY: G. Braziller.

Best, A., Moor, G., Holmes, B., & Clark, P. I. (2003). Health promotion dissemination and systems thinking: Towards an integrative model. *American Journal of Health Behavior,* S206.

Beverly, E., & Wray, L. (2010). The role of collective efficacy in exercise adherence: A qualitative study of spousal support and Type 2 diabetes management. *Health Education Research, 25*(2), 211-223.

Buhi, E., & Goodson, P. (2007). Predictors of adolescent sexual behavior and intention: A theory-guided systematic review. *Journal of Adolescent Health,* 40, 4-21.

Burke, V., Mori, T. A., Giangiulio, N., Gillam, H. F., Beilin, L. J., Houghton, S., Cutt, H. E., Mansour, J., & Wilson, A. (2002). An innovative program for changing health behaviours. *Asia Pacific Journal of Clinical Nutrition,* 11, S586-S597.

Cedervall, Y., & Critina, A. C. (2010). Physical activity and implications on well-being in mild alzheimer's disease: A qualitative case study on two men with dementia and their spouses. *Physiotherapy Theory and Practice*, *26*(4), 226-239.

Centers for Disease Control and Prevention (2004). Marital status and health: U.S. 1999-2002. Retrieved from http://www.cdc.gov/nchs/data/ad/ad351.pdf.

Centers for Disease Control and Prevention (2007). U.S. physical activity statistics. Retrieved from http://apps.nccd.cdc.gov/PASurveillance/StateSumResultV.asp

Chun, K. M., & Chesla, C. A. (2004). Cultural issues in disease management for chinese americans with type 2 diabetes. *Psychology & Health, 19*(6), 767-785.

Clark-Ibanez, M. (2004). Framing the social world with photo-elicitation interviews. *American Behavioral Scientist,* 47, 1507-1527.

Collier, J., Jr. (1967). *Visual anthropology: Photography as a research method.* Newbury Park, CA: Sage.

Cox, M. J., & Paley, B. (1997). Families as systems. *Annual Review of Psychology, 48*(1), 243.

Craig, L., & Truswell, A. (1988). Dynamics of food habits of newly married couples: Food related activities and attitudes towards food. *Journal of Human Nutrition and Diet*, 1, 401-412.

Craig, L. (1990). Dynamics of food habits of newly married couples: Weight and exercise patterns. *Australian Journal of Nutrition and Dietetics,* 12, 42-46.

Erlandson, D. A., Harris, E. L., Skipper, B. L., & Allen, S. D. (1993). *Doing naturalistic inquiry.* Thousand Oaks, CA: Sage.

Falba, T., & Sindelar, J. (2008). Spousal concordance in health behavior change. *Health Research and Educational Trust, 43*(1), 96-115.

Fernandez-Ballesteros, R., Diez-Nicolas, J., Caprara, G. V., Barbaranelli, C., Bandura, A. (2002). Determinants and structural relation of personal efficacy to collective efficacy. *Applies Psychology, 51*(1), 107-125.

Garrard, J. (1999). *Health Sciences Literature Review Made Easy*. Gaithersburg, MD: Aspen.

Glaser, B. G., & Strauss, A. (1967). *The discovery of grounded theory.* Chicago, IL: Aldine.

Goodson, P. (2010). *Theory in Health Promotion and Practice*. Sudbury, MA: Jones & Bartlett.

Hancher-Rauch, H., & Hyner, G. C. (2005). Are regular exercisers encouraged by their spouses? *American Journal of Health Studies, 20*(1), 2-6.

Harper, D. (2002). Talking about pictures: A case for photo elicitation. *Visual Studies, 17*(1), 13-26.

Homish, G., & Leonard, K. (2008). Spousal influence on general health behaviors in a community sample. *American Journal of Health Behavior, 32*(6), 754-763.

Hong, T., Franks, M., Gonzalez, R., Keteyian, S., Franklin, B., & Artinian, N. (2005). A dyadic investigation of exercise support between cardiac patients and their spouses. *Health Psychology, 24*(4), 430-434.

Hull, E. E., Rofey, D. L., Robertson, R. J., Nagle, E. F., Otto, A. D., & Aaron, D. J. (2010). Influence of marriage and parenthood on physical activity: A 2-year prospective analysis. *Journal of Physical Activity and Health*, 7, 577-583.

Jenson, M., Suls, J., & Lemos, K. (2003). A comparison of physical activity in men and women with cardiac disease: Do gender roles complicate recovery? *Women & Health*, *37*(1), 31-48.

Juarbe, T., Lipson, J., & Turok, X. (2003). Physical activity beliefs, behaviors, and cardiovascular fitness of mexican immigrant women. *Journal of Transcultural Nursing*, *14*(2), 108-116.

Jurj, A. L., Wen, W., Li, H. L., Zheng, W., Yang, G., & Xiang, Y. B. (2006). Spousal correlations for lifestyle factors and selected diseases in chinese couples. *Annals of Epidemiology*, 16(4), 285-291.

Keicolt-Glaser, J. K., & Newton, T. L. (2001). Marriage and health: His and hers. *Psychological Bulletin, 127*(4), 472-503.

Lewis, M. A., Butterfield, R. M., Darbes, L. A., & Johnston-Brooks, C. (2004). The conceptualization and assessment of health-related social control. *Journal of Social & Personal Relationships, 21*(5), 669-687.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Newbury Park, CA: Sage.

Macken, L. C., Yates, B., & Blancher, S. (2000). Concordance of risk factors in female spouses of male patients with coronary heart disease. *Journal of Cardiopulmonary Rehabilitation, 20*(6), 361-368.

McGarry, D. D. (2002). Perceiving the pattern of organization in a family system. *Systems Research & Behavioral Science, 19*(5), 499-506.

Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation.* San Francisco, CA: Josey-Bass.

Meyler, D., Stimpson, J., & Peek, M. (2007). Health concordance within couples: A systematic review. *Social Science & Medicine,* 64, 2297-2310.

Monden, C. (2007). Partners in health? Exploring resemblance in health between partners in married and cohabitating couples. *Sociology of Health and Illness*, *29*(3), 391-411.

Ortega, F., Brown, W., Lee, D., Baruth, M., Sui, X., & Blair, S. (2011). In fitness and health? A prospective study of changes in marital status and fitness in men and women, *American Journal of Epidemiology, 173*(3), 337-344.

Peshkin, A. (1988). In search of subjectivity- one's own. *Educational Researcher, 17(7)*, 17-22.

Pettee, K., Brach, J., Kriska, A., Boudreau, R., Richardson, C., Colbert, L., & Satterfield, E. (2006). Influence of marital status on physical activity levels among older adults. *Medicine & Science in Sport & Exercise, 38*(6), 541-546.

Prest, L. A., & Protinsky, H. (1993). Family systems theory: A unifying framework for codependence. *American Journal of Family Therapy, 21*(4), 352-360.

Raglin, J. S. (2001). Factors in exercise adherence: Influence of spouse participation. *Quest (00336297), 53*(3), 356-361.

Rogers, L., Shah, P., Dunnington, G., Greive, A., Shanmugham, A., Dawson, B., & Courneya, K. (2005). Social cognitive theory and physical activity during breast cancer treatment. *Oncology Nursing Forum, 23*(4), 807-815.

Ryan, R., & Deci. E. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1), 68-78.

Satariano, W. A., Haight, T. J., & Tager, I. B. (2002). Living arrangements and participation in leisure-time physical activities in an older population. *Journal of Aging and Health, 14*(4), 427-451.

Tams, K., & Moum, T. (1992). No large convergence during marriage for health, lifestyle, and personality in a large sample of Norwegian spouses. *Journal of Marriage and the Family,* 54, 957-971.

Thompson, B. (2006). *Foundations of behavioral statistics.* New York, NY: Guilford Press.

Trost, S., Owen, N., Bauman, A., Sallis, J., & Brown, W. (2002). Correlates of adults? Participation in physical activity: Review and update. *Medicine and Science in Sports and Exercise, 34*(12), 1996-2001.

Turner, R., & Marino, F. (1994). Social support and social structure: A descriptive epidemiology. *Journal of Health and Social Behavior, 35*(3), 193-212.

Umberson, D. (1992). Gender, marital status and the social control of health behavior. *Social Science Medicine, 34*(8), 907-917.

United States Census (2010). 2010 Census Demographic Profiles. Retrieved from http://2010.census.gov/2010census/data/.

Waite, L. (1995). Does marriage matter? *Demography,* 32, 483-508.

Waite, L., & Gallagher, M. (2000). *The case for marriage.* New York, NY: Doubleday.

Walker, R., & Luszcz, M. (2009). The health dynamics of late-life couples: A systematic review of the literature. *Aging & Society,* 29, 455-480.

Wang, C., & Burris, M. (1994). Empowerment through photo novella: Portraits of participation. *Health Education & Behavior,* 21, 171-186.

Weinman, J., Petrie, K. J., Sharpe, N., & Walker, S. (2000). Causal attributions in patients and spouses following first-time myocardial infarction and subsequent lifestyle changes. *British Journal of Health Psychology, 5*(3), 263-273.

Wilson, S. E. (2002). The health capital of families: An investigation of the inter-spousal correlation in health status. *Social Science & Medicine, 55*(7), 1157-1172.

Zhang, J., & Goodson, P. (2011). Predictors of international students' psychosocial adjustment to life in the United States: A systematic review. *International Journal of Intercultural Relations,* 35, 139-162.

APPENDIX A: CRITERIA FOR ESTABLISHING QUANTITATIVE METHODOLOGICAL QUALITY

Criterion	Description	Score	Distribution of characteristics among 16 quantitative & mixed method studies	
			Frequency (*n*)	Percentage (%)
1 Theoretical Framework	Presented explicit theoretical framework	2	6	38
	Presented implicit theoretical framework	1	6	38
	Did not present a theoretical framework	0	4	25
2 Validity	Reported validity coefficients for own data	2	1	6
	Reported validity coefficients for data from a previous study	1	9	56
	Did not report any validity coefficients	0	6	38
3 Reliability	Reported reliability coefficients for own data	2	4	25
	Reported reliability coefficients for data from a previous study	1	3	19
	Did not report any reliability coefficients	0	9	56
4 Measures	Reported both self report and objective measures (such as pedometer readings) of physical activity	2	3	19
	Reported only objective measures	1	0	0
	Reported only self report measures	0	13	81
5 Design	Longitudinal	1	6	38
	Cross sectional	0	10	62
6 Data analysis (Highest Level)	Multivariate statistics (canonical correlation analysis, discriminant function analysis, path analysis, structural equation modeling, MANOVA, MANCOVA)	2	4	25
	Multiple regression (ANOVA, ANCOVA)	1	7	44
	Bivariate statistics (Pearson *r, t* tests)	0	5	31
7 Effect Size	Reported effects sizes (R^2, Cohen's *d*, eta^2, percent of variance accounted for)	1	7	44
	Did not report effect sizes	0	9	56
	Total possible points	**12**		

Note: Table adapted from Zhang and Goodson (2011)

APPENDIX B: CRITERIA FOR ESTABLISHING QUALITATIVE METHODOLOGICAL QUALITY

Criterion	Description	Score	Distribution of characteristics among 5 qualitative and mixed method studies	
			Frequency (*n*)	Percent (%)
1 Theoretical Framework	Presented explicit theoretical framework	2	1	20
	Presented implicit theoretical framework	1	3	60
	Did not present a theoretical framework	0	1	20
2 Credibility	Reported naturalistic technique for establishing credibility (prolonged engagement, persistent observation, triangulation, peer debriefing)	1	4	80
	Did not report any credibility criteria	0	1	20
3 Transferability	Reported naturalistic technique for establishing transferability (thick description, purposive sample, reflexive journal)	1	3	60
	Did not report any transferability criteria	0	2	40
4 Dependability	Reported naturalistic technique for establishing dependability (dependability audit, reflexive journal)	1	3	60
	Did not report any dependability criteria	0	2	40
5 Confirmability	Reported naturalistic technique for establishing confirmability (confirmability audit, reflexive journal)	1	3	60
	Did not report any confirmability criteria	0	2	40
6 Sampling	Utilized purposive sampling	1	4	80
	Did not utilize purposive sampling	0	1	20
	Total possible points	**7**		

Note: Table adapted from Erlandson, Harris, Skipper, and Allen (1993)

APPENDIX C: SAMPLE INTERVIEW PROTOCOL

Study: How "I Do" Influences Physical Activity

Demographics/Background Information (To be collected at the beginning of the interview)

Full Name:

Age:	Gender:	Ethnicity:
Length of time married:	# of kids:	Occupation:
Highest level of education:		

General Physical Activity Questions

1) Could you compare your individual physical activity habits before you were married to your current physical activity? (Probe: How have things changed?)
2) Do you currently engage in physical activity with your spouse?
    a. If yes, how often?
    b. If yes, what kinds of activity do you engage in with your spouse?
3) What factors determine if you do something together?
4) What factors determine if you do something apart?

Social Cognitive Theory Lens

1) Does your spouse persuade you to be physically active? (If so, how?)
2) Does your spouse influence your confidence to be consistently physically active? (If so, how?)
3) If your spouse decides to go the gym on a Saturday, what kind of effect (if any) does this have on you?

General Systems Theory Lens

1) Do you work outside the home? If yes, how does your job influence your physical activity habits?
2) Does your spouses' job influence your physical activity? (If yes, how?)
3) Does your spouses' job influence physical activity you do together? (If yes, how?)
4) How do your children impact your physical activity?
5) How do your children impact physical activity you do as a couple?
6) What other factors outside your marriage influence your individual physical activity?
7) What other factors outside your marriage influence physical activity you do as a couple?

APPENDIX D: SAMPLE WRITTEN PHOTO ELICITATION INSTRUCTIONS

Each spouse will take 2 to 3 pictures capturing how your marriage influences your personal physical activity. You will then email these pictures back to me (email). Remember, activity could be walking the dog, going to the gym, or doing yard work. During our in-depth interview, I will bring my laptop so that we can view the photos you have taken. Please be thinking of why you chose to take particular photos.

Remember:

1) Please e-mail me the photos one week prior to the interview.
2) Call me if you have any questions (cell phone number).
3) Have fun and be creative!

APPENDIX E. INSTITUTIONAL REVIEW BOARD APPROVAL

TEXAS A&M UNIVERSITY
DIVISION OF RESEARCH AND GRADUATE STUDIES - OFFICE OF RESEARCH COMPLIANCE

1186 TAMU, General Services Complex 979.458.1467
College Station, TX 77843-1186 FAX 979.862.3176
750 Agronomy Road, #3500 http://researchcompliance.tamu.edu

Human Subjects Protection Program Institutional Review Board

APPROVAL DATE: 02-Aug-2011

MEMORANDUM

TO: MICHEL, KACY L
77843-4243

FROM: Office of Research Compliance
Institutional Review Board

SUBJECT: Initial Review

Protocol Number: 2011-0520

Title: Mr & Mrs: How 'I Do' Influences Physical Activity

Review Category: Expedited

Approval Period: 02-Aug-2011 **To** 01-Aug-2012

Approval determination was based on the following Code of Federal Regulations:

45 CFR 46.110(b)(1) - Some or all of the research appearing on the list and found by the reviewer(s) to involve no more than minimal risk.

Criteria for Approval has been met (45 CFR 46.111) - The criteria for approval listed

in 45 CFR 46.111 have been met (or if previously met, have not changed).
---
(6) Collection of data from voice, video, digital, or image recordings made for research purposes.

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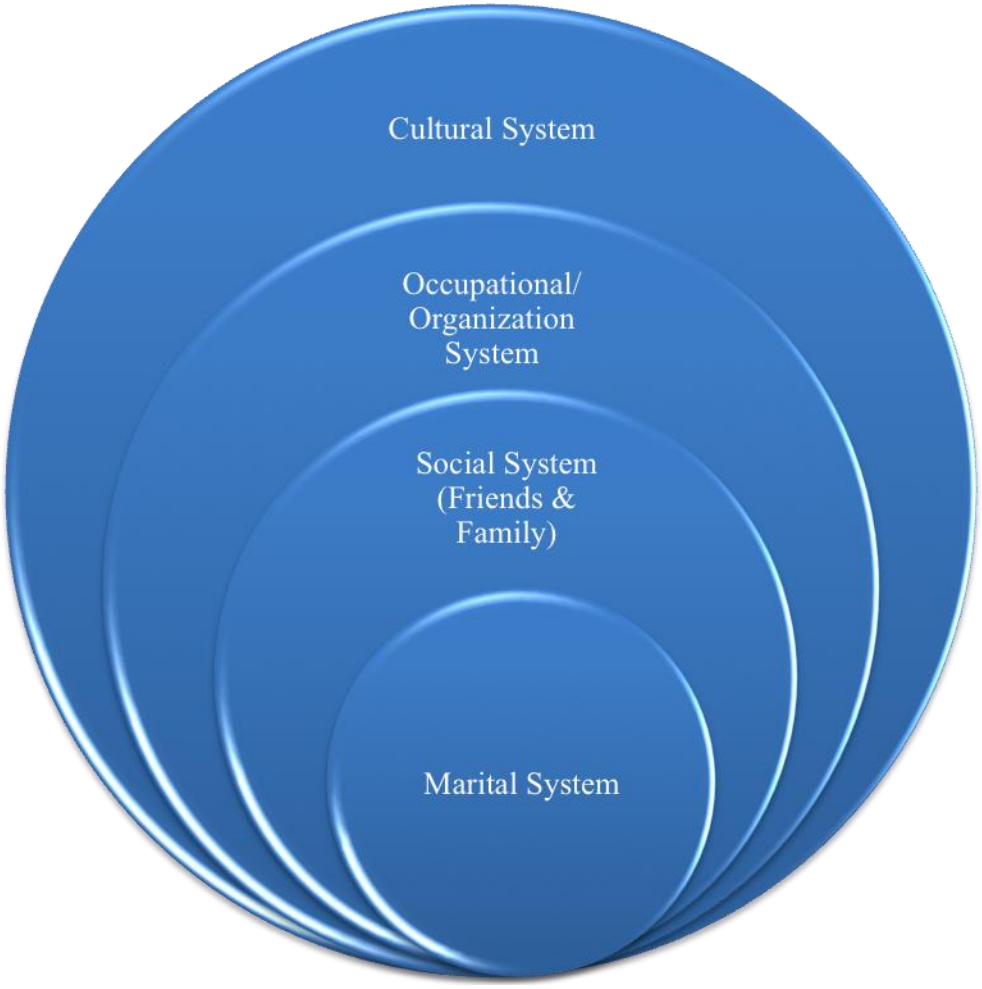
(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation or quality assurance methodologies.

(Note: Some research in this category may be exempt from the HHS regulations for the protection of human subjects. 45 CFR 46.101(b)(2) and (b) (3). This listing refers only to research that is not exempt.)

This research project has been approved. As principal investigator, you assume the following responsibilities

1. **Continuing Review:** The protocol must be renewed each year in order to continue with the research project. A Continuing Review along with required documents must be submitted 30 days before the end of the approval period. Failure to do so may result in processing delays and/or non-renewal.
2. **Completion Report:** Upon completion of the research project (including data analysis and final written papers), a Completion Report must be submitted to the IRB Office.
3. **Adverse Events:** Adverse events must be reported to the IRB Office immediately.
4. **Amendments:** Changes to the protocol must be requested by submitting an Amendment to the IRB Office for review. The Amendment must be approved by the IRB before being implemented.
5. **Informed Consent:** Information must be presented to enable persons to voluntarily decide whether or not to participate in the research project.

APPENDIX F: SYSTEMS CONCEPT MAP



VITA

Kacy Lane Michel received her Bachelor of Arts degree in English from Oklahoma State University in 2005. She entered the Communication program at Texas A&M University in August 2007 and received her Master of Arts degree in Communication (emphasis: Health Communication) in May 2009. Kacy earned her Doctor of Philosophy in Health Education at Texas A&M University in May 2012. Her research interests include physical activity adherence, child and family health, influence of culture on physical activity behavior, and interpersonal health communication. She plans to publish articles on these topics.

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