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Influences of Perceived Environment, Partner Support, and Attitudinal Familism
on Physical Activity among Mexican American Women

A dissertation submitted in partial satisfaction of the
requirements for the degree Doctor of Philosophy
in Nursing

by

Neomie Ceta Congello

2015

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ABSTRACT OF THE DISSERTATION

Influences of Perceived Environment, Partner Support, and Attitudinal Familism on Physical Activity among Mexican American Women

by

Neomie Ceta Congello

Doctor of Philosophy in Nursing

University of California, Los Angeles, 2015

Professor Deborah Koniak-Griffin, Chair

Healthy lifestyle behaviors such as engaging in physical activity (PA) may reduce the risk for cardiovascular disease (CVD), the number one cause of mortality among Mexican American women (MAW). Research findings show that MAW have low levels of leisure time PA and vary in the amount of overall PA. The influence of partner support has received little attention in studies examining predictors of PA. This cross sectional study investigated factors influencing PA among MAW aged 19 to 64 years old (mean = 39.4, *SD* = 11.1) who may be at increased risk for CVD based on hypertension, diabetes and obesity rates reported for the general population of Latinos. The study was guided by an ecological framework with variables identified at the community (the physical environment), interpersonal (family, friends and partner support, attitudinal familism, and intrapersonal levels (age, employment status, acculturation, body mass index [BMI], number of chronic health conditions). The sample recruited from Southern California included 112 self-identified MAW, predominantly born in

Mexico ($n = 98$, 88 %) and overweight/obese, who had low income and lived with their partner. An instrument packet was administered via individual interviews to facilitate understanding of questions among women with varying educational backgrounds and ability to read and write. The following self-report measures were administered in either Spanish or English: The Short International Physical Activity Questionnaire, the Abbreviated Neighborhood Environment Walkability Scale, an adapted Social Support and Exercise Survey, the Attitudinal Familism Scale, a demographic questionnaire and the General Acculturation Index. Although perceived PA ranged widely from low to high, a surprisingly large number of women (77.5%) reported moderate to high levels. Results of Pearson product-moment correlations showed that higher partner support, residential density, and acculturation and lower neighborhood crime were significantly associated with higher levels of PA. Acculturation and partner support were found to be significant predictors of PA in the multiple regression analyses. These findings suggest that future PA studies examining influences on PA and those testing PA intervention programs for MAW should address partner support and acculturation factors. Clinicians are encouraged to assess facilitators and barriers to PA in counseling MAW.

The dissertation of Neomie Ceta Congello is approved.

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Dedication

This dissertation is dedicated to my amazing husband Neil Congello, awesome son Ricky Congello and terrific daughter Kayla Congello. The tremendous strength, patience and unfailing love you have demonstrated throughout this process could have only been from God. Thank you for the nights we stayed awake designing documents, flyers and making photocopies. Such beautiful memories can never be forgotten! My sincerest gratitude is extended to my dissertation chair, Dr. Deborah Koniak-Griffin for the countless hours spent working together and for always seeing my potential. You have taught me so much about research! Thank you to my dissertation committee members: Dr. Ron Hays and Dr. Adey Nyamathi for your untiring guidance in this project, Dr. MarySue Heilemann for the knowledgeable discussions and Dr. Mary-Lynn Brecht for making Statistics so real. Thank you to Dr. Gail Washington from CSULA for your mentorship over the years, Dr. Aurelia O'Connell for the research ideas, Joy Toyama for the endless hours we spent in data analysis and Carmen Turner for your expeditious editorial guidance. Dr. James Sallis and Dr. Hector Balcázar, I appreciate that you have allowed me to use your instruments. Dr. Nurgul Fitzgerald, Dr. Peter Guarnero, Dr. Ester Cerin, and Kelli Cain, you have provided such expert consultation that prepared me for the study and the interpretation of findings. I am so grateful for my two research assistants Justina Fuentes and Sylvia Aquino for using their bilingual skills and experience. Many thanks to the study location directors, community advisory board, focus group members and translator. Without all of you this study would not have been possible. Finally, heartfelt thanks to all the women who participated in the study and shared their experiences to benefit others. I have such deep respect for every single one of you. Thanks to anyone else who I may have excluded. Together, you have all made this one incredible journey that has taught me so very much!

TABLE OF CONTENTS

CHAPTER 1.

Introduction.....	1
Background of the Problem.....	3
Significance of the Study.....	6
Purpose of the Research Study.....	8
Specific Aims and Hypotheses	8

CHAPTER 2. Review of Literature.....10

Physical Activity.....	10
Influences on Physical Activity.....	17
The Physical Environment	17
Partner, Family, and Social Support.....	19
Attitudinal Familism.....	24
Individual Characteristics.....	28
Summary and Recommendations.....	35

CHAPTER 3. Theoretical Framework.....38

Ecological Framework.....	38
Bronfenbrenner’s Ecological Model.....	39
McLeroy’s Extension of the Ecological Model.....	41
Application the ecological model.....	42
Application of the Ecological Model in Dissertation Study.....	44
Ecological Framework: Application in Physical Activity Studies.....	47
Summary.....	51

CHAPTER 4. Methods and Procedures.....	52
Overview of Research Study and Specific Aims.....	52
Study Design and Community Advisory Board.....	53
Study Sample and Eligibility criteria.....	54
Setting.....	55
Procedures.....	55
Variables of Study and Measures.....	58
Pilot Testing of Selected Measures.....	67
Data Management Plan.....	68
Data Analysis Plan.....	69
Human Subject Considerations.....	71
Limitations of the Study.....	72
Summary.....	73
CHAPTER 5. Results.....	74
Sample Characteristics.....	74
Scores for the Independent Variables.....	80
The Physical Environment.....	80
Partner Support.....	84
Attitudinal Familism.....	84
Acculturation.....	84
Scores for the Dependent Variable.....	85
Testing of Hypotheses.....	88
Correlations between objectively measured and self-reported PA.....	93

Summary.....	94
CHAPTER 6. Discussion.....	96
Major Significant Findings.....	96
Physical Activity.....	96
Social Support.....	99
Acculturation.....	102
Non-Significant Findings.....	103
Study Limitations.....	107
Implications for Clinical Practice and Recommendations for Future Research.....	108
Conclusio.....	111
APPENDICES	
A. Flyer.....	113
B. Short International Physical Activity Questionnaire (IPAQ).....	114
C. Pedometer Instructions.....	116
D. Physical Activity Log.....	117
E. Pedometer Locator Guide.....	118
F. Neighborhood Environment Walkability Scale (NEWS-A).....	119
G. Adapted Social Support for Exercise Scale (SSES).....	127
H. Attitudinal Familism Scale (AFS).....	131
I. Demographic Data Collection Form (DDCF).....	136
J. Consent to Participate in Research.....	140
REFERENCES.....	145

TABLES AND FIGURES

Chapter 3

Figure 1. An ecological model of factors.....	43
Figure 2. Applied from an ecological model.....	44

Chapter 5

Table 5.1 Sociodemographic characteristics of sample.....	76
Table 5.2 Health-related characteristics of sample.....	79
Table 5.3 Descriptive statistics for NEWS-A.....	83
Table 5.4 Descriptive statistics for independent variables.....	85
Figure 1 Values for MET levels.....	86
Table 5.5 Levels of Physical Activity.....	87
Table 5.6 Pearson product-moment correlations.....	89
Table 5.7 Regression models for individual characteristics.....	90
Table 5.8 Independent variables.....	92
Table 5.9 Descriptive statistics for IPAQ in pedometer wearers.....	94

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Chapter 1

Introduction

Cardiovascular disease (CVD) is the leading cause of death among people of most racial/ethnic groups in the United States, including female and male Hispanics (American Heart Association [AHA], 2015a). CVD is used as an umbrella term for circulatory conditions of the heart and blood vessels leading to atherosclerosis (accumulation of plaque that causes hardening of the arteries), hypertension (high blood pressure), myocardial infarction (blood clot in the heart), congestive heart failure (inadequate pumping of blood from the heart), arrhythmias (abnormal heart rhythm), and stroke (blood clot in the brain) (AHA, 2012a). Mortality attributed to CVD accounted for greater than 34% of deaths in the US in 2010, with an estimated \$444 billion in total costs (Centers for Disease Control and Prevention [CDC], 2010). The total direct medical expenditures related to CVD are projected to reach \$818 billion in 2030, not including the loss of productivity occurring from earnings lost through morbidity and early death (Heidenreich et al., 2011). The prevention of CVD demands further attention, as it can reduce healthcare costs and increase longevity. Risk for CVD among the rapidly increasing Hispanic/Latino populations in California (CDC, 2012a) is a major public health concern. The increased risk for CVD among Latino women is evident in the high prevalence of CVD risk factors, including hypertension, diabetes, and a growing epidemic of obesity defined as a body mass index (BMI) ≥ 30 (Los Angeles County Department of Public Health, 2010a).

The terms “Latino” and “Hispanic” are used interchangeably in this dissertation and include Mexican American men (MAM) and Mexican American women (MAW) unless otherwise specified. Any individual of Mexican, Central or South American, Puerto Rican, Cuban, or other Spanish origin and/or culture is considered to be Latino or Hispanic (The Office of Minority Health, 2012a). Mexican men and women comprise the largest percentage (64%) of

Latino/Hispanic populations living in the US (The Office of Minority Health, 2014a). Although deaths from CVD were 30% lower for Hispanic men and women than their non-Hispanic White counterparts in 2008, a comparison in 2011 showed that the likelihood of Hispanic adults having CVD was only 10% less than non-Hispanic White adults (The Office of Minority Health, 2014b). Hispanics in the U.S. comprise a younger subgroup than the national population (median age 27 [25 for Mexican Americans] vs. 37 years, respectively) (Pew Research Center, 2013). Hence, as Latinos continue to age, CVD incidence could potentially increase over the years. Further, the rapidly rising hypertension, diabetes, and obesity epidemic in Latino/Hispanic populations (CDC, 2015a) can lead to higher CVD rates. Hence, it is imperative to focus on risk for CVD among Latinas (Latino women), particularly in California, as it is projected that Latinas ≥ 50 years of age will increase in number to 56% of California females by the year 2050, while non-Latino White women will constitute only 17% of females in the state (Los Angeles County Department of Public Health, 2010b). This increased risk for CVD is particularly relevant to MAW since they belong to the subgroup with the largest percentage of Latino/Hispanic populations living in the US, of whom the majority (14 million) resides in California (The Office of Minority Health, 2014a).

A study conducted in 2000-2002 with 68,500 adults of various races/ethnicities in the US found obesity prevalence to be 24% of participants and more common among ethnic minority women than men (Sullivan, Morrato, Ghushchyan, Wyatt, & Hill, 2005). However, a report by the CDC based on data collected in 2011 and 2012 showed that Hispanic adults demonstrated higher rates of obesity than non-Hispanic Whites (43% versus 33%, respectively) (CDC, 2012b). Similarly, a report by the Office of Minority Health (2013a) (data collected in 2007-2010) showed that a higher percentage of obesity was present in MAW than non-Hispanic White

women (45% and 33%, respectively). Mexican American adults have an even higher prevalence of obesity than do other Hispanics/Latinos, especially among women (45% vs. 36% for men) (The Office of Minority Health, 2013a). Studies have identified that MAW are at increased risk for becoming obese (Barcenas et al., 2007; Bowie, Juon, Cho, & Rodriguez, 2007).

In a study conducted with adults of various races/ethnicities, BMI was shown to be associated with an increased prevalence of metabolic syndrome (Ervin, 2009), a health condition that can predispose individuals to risk of CVD (AHA, 2012b). A sample of 3,423 Mexican, non-Hispanic White and Black adults in the 2003-2006 NHANES showed that the likelihood of overweight and obese females meeting the criteria for metabolic syndrome was 5 and 17 times greater, respectively, compared to women of normal weight (Ervin, 2009).

A study that included Hispanic men and women found that lack of physical activity (PA) was highly associated with increased risk for CVD, regardless of the BMI levels of participants (Sullivan et al., 2005). PA is bodily movement of large muscles to perform activities, such as running and walking (Thompson et al., 2003).

Background of the Problem

Engagement in PA is beneficial for the health of individuals (AHA, 2015b) and, when combined with a healthful diet, is effective in decreasing obesity and subsequent risk for CVD in the US population (AHA, 2015c). PA decreases the risk for CVD in individuals who are overweight or obese (New York State Department of Health, 2012). Though a healthy diet is important in decreasing obesity, focus on the influence of diet is beyond the scope of this dissertation study; emphasis will be placed solely on factors influencing PA.

Examination of influences on PA is important because engagement in PA (at least 30 minutes, on at least 5 days or 150 minutes per week of moderate intensity aerobic activities such

as fast walking or bicycle riding on level terrain) was shown to decrease the risk for CVD by 30% to 40% among men and women in the US (AHA, 2015d). Among MAW, variations have been found across quantitative and qualitative studies examining PA in the amount and types reported. Results from a national study involving different races/ethnicities that included 5,455 Mexican adults showed that more MAW (50%) reported having no leisure time PA (LTPA) than their male counterparts (44%) (Neighbors, Marquez, Bess & Marcus, 2008). However, in a qualitative study that examined the lifelong pattern of PA among 71 MAW ages ≥ 50 years, women reported having consistently low activity levels while performing occupation, leisure, and household duties since they were 15 years old, based on scores for high and low PA collaboratively assigned by the participant and data collector (Cromwell & Berg, 2006). However, in-depth interviews with 16 women selected from a larger study of 269 Latina immigrant women predominantly from Mexico reported that having two jobs, working in physically demanding occupations, and performing household tasks left little time and energy to engage in leisure time activities (Skowron, Stodolska & Shinew, 2008). These differences found in the amount of self-reported PA performed for occupation and household activities indicate that further investigation is warranted in order to examine overall PA and to determine influences on PA based on perceptions of women in this subgroup.

Importantly, how participants perceive PA can influence their engagement in PA. A study with 153 Latino men and women that examined factors related to LTPA (e.g., sports) showed that participants who perceived PA as important had the highest level of LTPA (Marquez & McAuley, 2006b). Findings of a study examining predictors of PA among 304 MAW of low socioeconomic status revealed that perceived ability to control barriers (e.g., access

to exercise facilities) was the strongest predictor of engagement in PA (Guinn, Vincent, Jorgensen, Dugas, & Semper, 2007).

An individual's perception of his/her PA, *perceived PA* (Marquez & McAuley, 2006a), is obtained through self-report. A study conducted in 12 countries with adults 18 to 65 years old indicated that self-reports accurately reflected PA levels when compared to accelerometer readings (Craig et al., 2003). In contrast, a systematic review of 23 studies conducted in various countries showed that self-reports overestimated actual PA levels as measured by objective devices (e.g., accelerometers used to measure activity counts and time spent in PA) (Lee, Macfarlane, Lam, & Stewart, 2011). However, these results may be related to differences in how self-reported PA was measured (e.g., questions pertain to amount of time spent in PA versus categories of low, moderate, and high PA).

Past studies with MAW have identified several important influential factors on PA including perceptions of the physical environment (Parra-Medina & Hilfinger Messias, 2011), partner support of PA (Evenson, Sarmiento, Macon, Tawney, & Ammerman, 2002), and attitudinal familism (Austin, Smith, Gianini, & Campos-Melady, 2012). The influences of these factors on PA among MAW have not been examined collectively. The physical environment of an individual's community may include aesthetic features (Cerin, Saelens, Sallis, & Frank, 2006) or natural sights that are attractive (Carlson et al., 2012), and the accessibility of sidewalks and bikeways (Bengoechea, Spence, & McGannon, 2005) that encourage and foster safe PA, such as walking.

Partner support for PA refers to the support participants receive from their partners that encourages a positive attitude towards PA (Juarbe, Lipson, & Turok, 2003). Partners may be spouses or significant others living with the participant. Attitudinal familism is a complex

construct that emphasizes the importance of the family. Its four major components include: 1) value placed on one's family over oneself; 2) strong emotional and physical closeness by spending time together to maintain familial interconnectedness; 3) support provided for and received from family members (known as familial reciprocity); and 4) protection of the family name (familial honor) (Steidel & Contreras, 2003). Women who prioritize the fulfillment of household obligations and caregiver roles over personal engagement in PA (Skowron et al., 2008) demonstrate attitudinal familism. A study of 100 MAW found high attitudinal familism was negatively associated with PA and subsequent weight loss (Austin et al., 2012), suggesting that a commitment to attitudinal familism may inhibit weight loss.

Previous PA studies conducted with MAW have specifically identified the importance of examining the following individual characteristics: age, BMI (Dergance, Mouton, Lichtenstein, & Hazuda, 2005), chronic health conditions (e.g., hypertension and diabetes) (Juarbe, Turok, & Perez-Stable, 2002), employment status (Domelen et al., 2011), and level of acculturation (Espinosa de los Monteros, Gallo, Elder & Talavera, 2008). Such examination of individual characteristics is warranted based on significant relationships found between age and LPTA, BMI and LTPA (Dergance et al., 2005), the identification of chronic health conditions as a perceived barrier to PA (Juarbe et al., 2002), an associated relationship found between employment and PA (Domelen et al., 2011), and a similar association found between acculturation and PA (Espinosa de los Monteros et al., 2008).

Significance of the Study

The high rates of overweight and obesity among MAW (CDC, 2014a), together with the increased prevalence of hypertension found among Hispanic/Latino populations, now almost equaling their non-Hispanic counterparts (22% and 24%, respectively) (The Office of Minority

Health, 2014b) are major risk factors for CVD that can be modified by PA (AHA, 2015c). Disparities in language fluency, insurance coverage, and access to care between Hispanic/Latino and non-Hispanic White populations continue to exist (The Office of Minority Health, 2012a). Fewer Hispanic men and women (14%) meet the PA recommendations than their non-Hispanic White counterparts (23%) (CDC, 2014b). The recently reformed US healthcare system has placed an increased emphasis on preventive care (United States Department of Health and Human Services [USDHHS], 2015), which is one of the objectives for Healthy People 2020 (USDHHS, 2012b). Hence, policy makers, healthcare professionals, and practitioners are expected to show increasing interest in PA levels and reducing risk of CVD among MAW. Research focusing on factors influencing PA among MAW can benefit the nursing profession; hence, knowledge gained through this study can contribute to providing improved care for this subgroup of the population.

Application of an ecological framework in studies examining PA is particularly helpful, because multiple factors are considered as potentially influencing activity levels. However, few PA studies were found with Latino women using this approach (Martinez, Arredondo, Perez, & Baquero, 2009; Skowron et al., 2008). For this dissertation, variables of the study are applied at different levels of the ecological model ranging from the intrapersonal to the larger macro or public policy level that can influence behavioral change (Fitzgerald & Spaccarotella, 2009). More specifically, the perceived physical environment is applied at the community/institution level; partner support and attitudinal familism are applied at the interpersonal level; and individual characteristics are explored at the intrapersonal level (Fitzgerald & Spaccarotella). A greater understanding of the multi-level influences of PA can uniquely contribute to the

development of culturally tailored PA programs, supporting modified lifestyle behaviors to promote cardiovascular health among MAW.

Purpose of the Research Study

The main purpose of this study was to increase understanding of influences on PA in MAW by examining relationships among the perceived physical environment, partner support, attitudinal familism, and selected individual characteristics (age, BMI, chronic health conditions, employment status, and acculturation) and PA. This was accomplished by testing the following hypotheses.

Specific Aims and Hypotheses of the Proposed Research Study

This cross sectional study collected self-reported data on perceptions of the physical environment, partner support, attitudinal familism, and selected individual characteristics. Five specific aims and corresponding hypotheses were formulated.

Specific Aim 1. To examine the relationships between characteristics of the physical environment and PA levels in MAW.

Hypothesis 1. MAW living in areas where the physical environment supports PA will have higher levels of PA.

Specific Aim 2. To examine the relationship between partner support and PA levels in MAW.

Hypothesis 2. MAW with higher levels of partner support will have higher levels of PA.

Specific Aim 3. To examine the relationship between attitudinal familism and PA levels in MAW.

Hypothesis 3. MAW with higher levels of attitudinal familism will have lower levels of PA.

Specific Aim 4. To examine the relationships between individual characteristics (age, BMI, number of chronic health conditions, acculturation, and employment status) and PA levels in MAW.

Hypotheses 4. MAW of older age, higher BMI, greater number of chronic health conditions, lower acculturation levels and who were unemployed will have lower levels of PA.

Specific Aim 5. To evaluate relative influences of the physical environment, partner support, attitudinal familism, and individual characteristics on PA levels in MAW.

Hypothesis 5. MAW who live in physical environments that are more supportive of PA; have higher partner support; lower attitudinal familism; younger age, lower BMI, fewer chronic conditions, are employed, and are more acculturated will have higher levels of PA.

The following five chapters in this dissertation provide a review of the literature, theoretical framework, methods and procedures, results, and discussion on this investigation of PA among MAW.

Chapter 2

Review of Literature

The well-established link between decreased levels of physical activity (PA) and cardiovascular disease (CVD) underscores the importance of PA for cardiovascular health (Centers for Disease Control and Prevention [CDC], 2011a). Among Hispanic/Latino adults, increased risk for CVD, evidenced by high rates of hypertension, diabetes, and obesity (CDC, 2015a), is compounded by the problem that fewer Hispanic adults continue to meet the recommended guidelines for PA than non-Hispanic White adults (14% and 23%, respectively) (CDC, 2014a).

Definitions of the terms “Hispanic” and “Latino” vary in the literature, showing both similarities and differences among ethnic subgroups. In this dissertation, Mexican American women (MAW) are considered a subset of Latino/Hispanic populations. However, in this literature review, the term used by the author(s) has been maintained for the population of each discussed. This provides acknowledgement of the authors’ definition of these populations, and avoids confusion by maintaining consistency of terms used in original studies.

MAW have higher rates of obesity than non-Hispanic White women (45% and 33%, respectively) (The Office of Minority Health, 2013a). Overall, Hispanic women have lower levels of PA than non-Hispanic White and Black women (CDC, 2014a). The increased risk for CVD (American Heart Association [AHA], 2015c) with obesity and low levels of PA supports a study examining influences on PA levels among MAW.

Physical Activity

PA, together with a healthful diet, can decrease the incidence of obesity and reduce the risk for CVD (AHA, 2015c). The AHA (2015c) promotes a healthy diet and PA for weight loss.

Adequate PA (consisting of 150 minutes per week or a minimum of 30 minutes of daily moderate-intensity aerobic activities on 5 days) has been specifically shown to decrease the risk of CVD among men and women by 30% to 40% (AHA, 2015d). Although acknowledging the importance of both health behaviors (diet and PA), this dissertation focuses on factors influencing PA. Strong support exists for targeting PA, since Spanish-speaking MAW have reported low levels (Neighbors et al., 2008).

Focus on PA is crucial because guidelines from the AHA (2015d) specify 150 minutes of moderate PA or 75 minutes of vigorous body movements per week as essential for an adequate expenditure of calories as well as for cardiovascular benefits, including improved circulation and reduced risk for CVD. Findings of a systematic review of 69 studies conducted primarily in the US with students, church attenders, and employees demonstrated that shorter intervals of PA lasting 10, 15, or 20 minutes, factored into daily routine, produced the same health benefits as longer periods (Barr-Anderson, AuYoung, Whitt-Glover, Glenn, & Yancey, 2011). These shorter periods of PA (e.g., walking in increments of 10 to 15 minutes) may make it more appealing and feasible for individuals to gain cardiovascular benefits (AHA, 2015b). Despite these recommended changes, however, low levels of PA continue to be reported among Hispanic/Latino women.

While reports from the Behavioral Risk Factor Surveillance System (BRFSS) have identified Hispanic and Black adults as having less leisure time PA (LTPA) than their non-Hispanic White counterparts (Marshall et al., 2006), the highest prevalence of inactivity was found among Hispanic women (Kruger, Ham, & Sanker, 2008). Analysis of data from the 2007 BRFSS, based on a multi-ethnic sample including Hispanic men and women, indicated that those with occupations requiring heavy labor or walking reported performing sufficient PA at the

recommended levels for the attainment of health benefits (Bensley, VanEenwyk, & Ta, 2011). The number of sedentary occupations has increased 83% since 1950 (AHA, 2015e), creating an increasing challenge for individuals to acquire adequate PA during the performance of occupational duties. Furthermore, Hamilton and colleagues (2008) emphasized that in spite of adequate engagement in PA of 30 minutes per day, sedentary behaviors, such as sitting for long periods of time, can result in low expenditures of metabolic energy that do not contribute to cardiovascular health (Hamilton, Healy, Dunstan, Zderic, & Owen, 2008).

An investigation based on data retrieved from the 2005-2006 National Health and Nutrition Examination Survey (NHANES), used to investigate compliance with 2008 PA Guidelines for Americans (PAGA) among US adults, found differences between self-reported and objectively measured PA (Tucker, Welk, & Beyler, 2011). Although self-reported moderate and vigorous PA were lower among MAM and MAW than non-Hispanic White adults, higher moderate and vigorous PA were found in the former based on accelerometer readings. Variations found between self-reported transportation, household, and LTPA and the actual PA levels of participants may be related to differences in perceptions of PA (e.g., moderate level activities reported as low). Despite variations found in the multiple measures (i.e., self-reports and accelerometers) used to operationalize PA among MAW, it is worthwhile to note that while accelerometer readings can capture actual movements, self-reports based on perceptions are necessary to identify different types of PA (i.e., transportation, household, and LTPA) in determining overall PA.

Perceptions of Physical Activity

How participants view PA is an important influence on their engagement in PA. In a study conducted with 71 MAW aged 50 years and older, PA was perceived as a prescription for

the treatment of illnesses rather than a mandate for healthy individuals (Cromwell & Berg, 2006). Beliefs about PA and low sedentary lifestyle patterns, found based on the predominantly low PA reported in performing occupational, household, and leisure time activities, support the need to better understand PA in this subgroup of the population.

Mier, Medina, and Ory (2007) found during interviews conducted with 39 MAW that most defined PA as a combination of activities related to home (sweeping and mopping), work, and leisure time (e.g., aerobics and yoga) including sports (e.g., swimming, running, and biking). Data obtained from the NHANES III (1988-1994) examining LTPA among 5,893 MA adults revealed that English-speaking Mexican American (MA) adults showed a higher prevalence of LTPA than their Spanish-speaking counterparts (Crespo, Smit, Carter-Pokras, & Andersen, 2001). Crespo and colleagues suggested that findings of their study on LTPA among MAW may be related to interpretation of what is considered LTPA and how occupation and transportation-related activities are viewed by the participants.

Evidence suggests that MAW think that they do not need to increase their PA levels, because they feel that they get sufficient PA performing leisure time, household, and occupational duties (Cromwell & Berg, 2006). Participants (71 MAW) in that study believed that their jobs, plus caring for their families and their homes, required them to work hard; hence, they did not need additional PA. In another study that included Hispanic women, participants similarly stated there was no need to increase their PA, because they already had adequate levels in their occupational duties (Im et al., 2010). Skowron and colleagues (2008), in examining LTPA among 269 Latinas, also reported that participants saw themselves as already physically active in accomplishing their household responsibilities.

Interestingly, findings of one study conducted with 210 adults revealed that more MAW (98%) than their European American counterparts (78%) reported that LTPA can result in improved health (Dergance et al., 2003). Importantly, findings of an intervention study involving 1,903 MAW showed that compared to the control group, individualized counseling on behavioral change resulted in increased self-reported moderate and vigorous PA based on exercise, fun, and transportation activities (Coleman et al., 2012). Since intervention programs can help MAW increase their PA levels, consideration of how much PA is performed when participants include occupational and household duties is vital, as the women may need to understand that their actual PA is likely to be insufficient to provide cardiovascular benefits (Marquez, Bustamante, McAuley, & Roberts, 2008).

Components of PA

Overall PA consists of various components or PA domains (i.e., transportation, occupation, household, and LTPA) identified in a large secondary analysis involving PA data collected from 1999 to 2002 on Latino adults, including MAW from four large national databases (Ham, Yore, Kruger, Heath, & Moeti, 2007). In this study, participants with low income and education levels engaged in a high rate of transportation-related PA (i.e., bicycling or walking to work). Additionally, women reported higher levels of PA related to transportation than their male counterparts (Ham et al., 2007). Although previous research studies have focused on household and LTPA among MAW, walking for transportation (Martinez et al., 2011; Vaughn, 2009; Wilbur, Chandler, Dancy, & Lee, 2003) and occupation (Ayala, Gammelgard, Sallis & Elder, 2011; Domelen et al., 2011) were less frequently included as components of PA.

Walking was identified as the most common type of activity in a study conducted with 45 Latin-American women who were primarily Mexico-born and had low educational levels (Vaughn, 2009). However, studies that examined walking as a form of PA among MAW have shown inconsistent results (Martinez et al., 2011; Wilbur et al., 2003). A study involving 300 Latino women of predominantly Mexican origin has shown that 36% met the recommended guidelines for PA; more time was spent walking among women living within walking distance to stores (Wilbur et al., 2003). In contrast, in another study conducted with 672 predominantly low educational level Mexican American adults (71% women), less than 30% of the total sample met the recommended PAGA (Martinez et al., 2011). Based on PAGA, results across studies showed that more women were physically active when PA assessment included both transportation and work activities compared to transportation alone (36% versus 29%), indicating that activities related to transportation and occupation should be included as components in the measurement of overall PA.

Previous studies among MAW have examined the amount of occupational PA among those who worked full time (Ayala et al., 2011) and those who worked in sedentary jobs (Domelen et al., 2011). Investigators examining 633 Latino adults, predominantly MAW, found that those who worked in jobs exceeding 20 hours per week performed more occupational PA than those who did not (Ayala et al., 2011). Results of another study examining employment and PA among 1,826 adults in the US, including a small sample of MAW (8%), showed that those who worked full time in sedentary jobs were more sedentary on weekdays than those who did not work (Domelen et al., 2011). Thus, factors that can influence amount of occupation-related PA performed among MAW include number of hours worked and having sedentary jobs. Based

on results found across studies, activities related to transportation and occupation are important components of PA that should be included in the measurement of overall PA among MAW.

Actual Physical Activity

Importantly, self-reported PA may differ from “actual” PA, and people may not be as active as they think (Drystad, Hansen, Holme & Anderssen, 2014). PA may be objectively measured using pedometer or accelerometer readings that can be compared to self-reported (perceived) PA based on recall (Ainsworth, Cahalin, Buman, & Ross, 2014). Data generated by the pedometer may be used to classify actual levels of activity, and to determine if individuals achieve 10,000 steps or more per day (AHA, 2015f). While both devices are used to record step counts, the pedometer is simpler and less expensive, while the accelerometer can measure sedentary and total activity time at light, moderate, and vigorous activity levels (Kinnunen et al., 2011). In a study comparing pedometer and accelerometer data among 58 pregnant and predominantly White women, results showed no significant differences in the daily step count between the two methods (Kinnunen). Pedometers have been used to measure PA levels in PA intervention studies with 56 Hispanic, 18 African American, 19 White (Clarke et al., 2007), and 55 MAW (Romero, Villas, Semper, & Jorgensen, 2008). Results of these studies demonstrated that pedometer use to measure the daily number of steps effectively increased the PA levels of women.

Overall, studies have used accelerometers, pedometers, and self-reports to operationalize PA differently based on what is being measured. While accelerometers provide a more comprehensive measure that extends beyond number of daily steps (Kinnunen et al., 2011), pedometers have been identified as a motivational tool for increasing PA levels (Clarke, et al., 2007; Romero et al., 2008), and self-report is used to determine the individual’s perceived PA.

Individuals may not always demonstrate adequate PA necessary for CVD benefits despite understanding of the need to engage in increased PA. A study of 51 immigrant women from Mexico showed that even though 94% of participants stated that PA will lead to increased energy and muscle strength, 78% reported that they did not engage regularly in PA, and 76 % had poor or below average cardiovascular fitness (Juarbe et al., 2003). Cardiovascular fitness was assessed using a sturdy bench for a step test lasting over a period of 3 minutes, after which the blood pressure and heart rate were checked. This was used as a measure of physical behavior. Importantly, this study revealed that even though MAW may view PA as primary to their physical health, they still may not engage in it (Juarbe et al., 2003). Lack of engagement in PA may be related to a variety of influential factors.

Influences on Physical Activity

Some of the important influences on PA among MAW are similar to those identified among Latino/Hispanic women overall. In general, these influences pertain to the following four main areas: perceptions about the physical environment (Evenson et al., 2002), perceptions about partner support (Martinez et al., 2009; Skowron et al., 2008), attitudinal familism (Austin et al., 2012), and individual characteristics. Individual characteristics include age (Ewing, Schmid, Killingsworth, Zlot, & Raudenbush, 2003), BMI (Cossrow & Falkner, 2004), chronic conditions (Sullivan et al., 2005), employment status (Martinez et al., 2009), and acculturation (Abraido-Lanza, Armbrister, Florez, & Aguirre, 2006).

The Physical Environment

The physical environment, also referred to as the built environment, includes physical aspects of the neighborhood that can impact health behaviors (Oakes, Forsyth, & Schmitz, 2007). Studies that examined the physical environment have assessed the types of residences, locations

of businesses, accessibility, street connectivity, exercise facilities, attractiveness of neighborhood, traffic safety, safety from crime, and satisfaction with the neighborhood environment (Adams et al., 2011; Kerr et al., 2006).

The physical environment can also be measured using Geographic Information Systems (GIS) to provide data, such as field maps of the community (CDC, 2015b). In examining PA, both the perceived and actual physical environment are important, since results between them can differ (Kerr et al., 2006; Saelens, Sallis, Black, & Chen, 2003). For example, parents' perceptions of the physical environment have been shown to influence their decisions regarding how their children commuted to school (riding in a car or bus, walking, or biking) (Kerr et al., 2006). Kerr and colleagues conducted this study with 259 parents of children (ages 5-18) to examine walkability of the physical environment through both subjective and objective GIS measures. Findings revealed that parental concern for safety through their perceptions of the physical environment were highly associated with whether or not their children walked or biked to school. This demonstrates the potent influence of parental perceptions of the physical environment on PA (Kerr et al., 2006).

Several quantitative studies that measured participants' perceptions of physical environment with multiple races/ethnicities, including Latinos/Hispanics, have demonstrated the value of operationalizing perceived physical environment on PA behaviors (Brownson, Baker, Housemann, Brennan, & Bacak, 2001; Oakes et al., 2007; Saelens et al., 2003). A study conducted with 9,252 participants from various states within the US revealed that individuals, particularly culturally diverse women, were less likely to walk if they perceived that their physical environment was unsafe, regardless of the measured objective walkability of the community (Doyle, Kelly-Schwartz, Schlossberg, & Stockard, 2006). Walkability was

calculated using a formula that included the average distance of blocks, number of intersections, and number of miles of a road, with results showing that the majority of cities were not walkable.

The physical environment was examined in terms of neighborhood safety for walking, through views obtained from Latino women in one study (Evenson et al., 2002) and from White and African American men and women in another study (Brownson et al., 2004). Common results across these studies indicated that the perceptions of participants concerning a lack of safety, pertaining to heavy or speeding traffic and the presence of unleashed dogs in the neighborhood, deterred them from engaging in PA (Brownson et al., 2004; Evenson et al., 2002). In a qualitative study utilizing focus group methodology, Evenson and colleagues (2002) obtained data on the physical environment and policy factors pertaining to transportation and the lack of exercise facilities, in combination with cost and safety elements related to PA. Findings showed that, aside from reported feelings of isolation from the community, barriers to PA included views held by participants on placing the needs of families above their own, language barriers, lack of childcare, and lack of spousal support for PA. These barriers illustrate that the numerous influences on PA extending beyond the physical environment should also be considered.

Partner, Family, and Social Support

Perceived partner support for PA is based on the individual's subjective evaluation or perception of support received from their partner rather than the viewpoints or opinions of others regarding the actual support a partner provides (Evenson et al., 2002; Juarbe et al., 2002).

Partner support towards PA specifically applies to the participant's view of support received from spouse or significant other living with the participant (Harley & Eskenazi, 2006; Skowron

et al., 2008). Few studies found in qualitative research have specifically examined the influence of partner support of PA among MAW (Fleury, Keller & Perez, 2009; Juarbe et al., 2003).

Studies that examined PA among Hispanics/MAW have shown mixed results ranging from partner support for PA to barriers created by them. In a study with 51 Mexican immigrant women that examined PA based on exercise (i.e., a subset of PA intended for physical fitness) and cardiovascular fitness, partner support played a central role and was identified as the most common barrier towards PA (Juarbe et al., 2003). Juarbe and colleagues' findings revealed that MAW held cultural views that women are primarily responsible for caring for their homes and families, even while working outside the home. Also, partners of MAW may not view PA as culturally appropriate or safe for women, and therefore may not demonstrate supportiveness towards their engagement in PA. In turn, women's perception of lack of partner support for PA can influence their PA levels. Results of a qualitative study of seven Hispanic women examining PA related to household chores, yard work (gardening), playing with dogs, and dancing showed that the expectation of partners regarding the woman's duties in family obligations and her caregiver role within the home created barriers towards PA (Fleury et al., 2009).

However, other studies examining partner support among MAW have shown different results. Although findings from Williams' study (1990) with 75 MA couples living in Texas also supported the traditional view of the role of women in providing care for their homes and families, change occurred as women became more educated and began having professional careers. Among families with professional women who received college level education, there was a reported sharing of household and childcare responsibilities between husbands and wives. Thus, with higher educational achievement and change in type of employment, women were no longer expected to fulfill their traditional role, but instead shared household responsibilities with

their husbands (Williams, 1990). This change in the role of women is very pertinent, because increased education and a change in employment status may be associated with greater partner support, enabling MAW to engage in PA if they no longer feel fully responsible for all household duties. Support for this association is found in a study involving 167 MA families with low and moderate income levels (Coltrane, Parke & Adams, 2004). Findings showed that father involvement in household work (e.g., cooking, cleaning, and laundry) increased when their wives were more educated and had higher earnings. Results also identified familism as an important influence on father involvement, in that fathers valued family cohesion by focusing on important family rituals (e.g., sharing weekend activities and mealtimes together). Findings across studies suggest that greater father involvement in sharing household responsibilities, particularly childcare, can help MAW gain more time to engage in PA.

Nevertheless, in a study involving in-depth interviews with 269 Latinas (Skowron et al., 2008), even though Latino women reported having positive attitudes, and feeling highly supported by their family and friends, they still demonstrated low levels of leisure time PA. Yet almost all participants in the study who were either married or living with a partner, reported that their partner was supportive towards their PA. Some participants further stated that that they would be more motivated to engage in LTPA if their husbands or partners would join them in performing PA (Skowron et al., 2008). Because participants were recruited from community parks and a sports complex that were conducive towards PA, the study participants may not have been representative of women in general. Findings across studies indicate that while most MAW with lower education and income levels may experience barriers or receive very low support for PA from their partners, as women become more educated and have increased income they are

shown to receive increased partner support in sharing household responsibilities, identified in qualitative studies as a major reason for a lack of PA.

Quantitative PA studies have examined support for PA received from family, friends, and health care professionals in the community. Findings from various studies have shown the influence of family support on PA among MAW or Latino/Hispanic populations (Balcazar, Krull, & Peterson, 2001; Kohlby & Nies, 2010; Pekmezi, Marquez, & Marcus-Blank, 2010).

A systematic review of 31 PA intervention studies involving Latino/Hispanic adults demonstrated that family support had positive influences in producing long-lasting effects on PA among participants (Pekmezi et al., 2010). Similarly, a recent review examining the influences on PA among Latino women identified family and friends as important in facilitating PA (Larsen, Pekmezi, Marquez, Benitez & Marcus, 2013). Further, results from a review of 91 studies involving participants from diverse races/ethnicities, including some with Hispanic women, revealed that family and friends are important influences on PA specified as household, transportation, and leisure type activities (Eyler et al., 2002). Several individual studies conducted with participants of Hispanic and MA populations have shown that family members can play a positive role in providing support for lifestyle changes to promote PA and enhance health outcomes (Balcazar et al., 2001; Kohlby & Nies, 2010; Vincent, 2009). The CDC has also acknowledged support for PA received from family and friends as a key element in fostering engagement in PA (CDC, 2011b). Studies with Latino men and women that examined influences on LTPA have considered support received from friends and families (Marquez & McAuley, 2006b; Skowron et al., 2008). Marquez & McAuley (2006b), investigating correlates of LTPA among 153 Latino adults (86 women) of primarily Mexican descent, found that those with high LTPA received greater support from their friends than those with low LTPA. No

significant differences were found for social support received from family. The myriad of systematic reviews and individual studies identifying support for PA received from family and friends as influences on PA levels provide evidence suggesting the importance of examining these factors as components of social support in the examination of PA among MAW.

In addition to support from family and friends, social support received from leaders in the community, such as promotoras (community health workers), may also be beneficial in enhancing PA among MAW. Promotion of social support has been identified as a component of intervention strategies used in several PA studies. This was demonstrated in a study conducted with 20 MA adults, predominantly women (71%), involved in testing an 8-week group educational program provided by promotoras and involving family members (Vincent, 2009). Results showed that participants who received the intervention displayed increased PA and decreased weight compared to the control group who received diabetes education alone.

Based on results from another promotora-led study with 18 MAW, the initial effect of social support for PA received from friends may be influential but not long lasting (Keller & Gonzales, 2008). Having a friend as a walking companion was the greatest influential factor to promote walking; however, the friendship strategy used to promote PA in this 36-week intervention study did not lead to sustained high levels of PA, given that friendships were not retained for the entire length of the study (Keller & Gonzales). Differences in results of these promotora-led studies may be related to the duration of the intervention (8 weeks versus 36 weeks). The lengthier 36-week study involving walking groups may have made it difficult for friends to continue to provide support. Partner support was not examined in these studies.

Attitudinal Familism

Familism, sometimes considered a defining cultural attribute among Hispanic populations (Schwartz, 2007), is a core cultural value present among MA men and women (Callister & Birkhead, 2002). The term familism may have cultural underpinnings, particularly among MAW, who are shown to hold strong values on care and obligation towards the family (Padilla & Villalobos, 2007). Attitudinal familism represents a broader and more complex view of the phenomenon of familism (Steidel & Contreras, 2003). The multidimensional nature of attitudinal familism is represented by four major interrelated factors that include predominance of family needs above self; close proximity between homes of family members to maintain physical and emotional connection; desire for family reciprocity as family members give and receive support from each other; and value placed on the protection and honor of the family name (Steidel & Contreras, 2003). Focus on these four factors of attitudinal familism provides a broad approach to cover many cultural aspects of MA populations. PA may also be influenced by these cultural factors (Mier et al., 2007).

Precedence of family needs. The concept of attitudinal familism, indicating a belief in the value of sacrificing one's personal needs for the benefit of the family, has been alluded to in some studies in which participants were shown to place a higher priority on the family above self (Martinez et al., 2009; Mier et al., 2007; Steidel & Contreras, 2003). Participants in a number of studies believed that they did not have time to perform PA because of the time required to fulfill their established role as primary caregiver and in accomplishing family obligations (Fleury et al., 2009; Mier et al., 2007; Skowron et al., 2008).

In a study conducted by Evenson and colleagues (2002) involving 49 Latino women born in Mexico, participants perceived that they did not have time to engage in PA programs because

they were expected to fulfill their roles in caring for their husbands, children, and home. In another study that examined the perceived benefits and barriers to physical activities among 149 MAW, the women identified their role as the primary caregiver for their children and their responsibilities in caring for sick relatives as time barriers that hindered them from participating in PA (Juarbe et al., 2002). Likewise, participants in two other studies with MAW and Hispanic women reported that the fulfillment of household obligations and their caregiver roles received higher priority than their engagement in PA (Im et al., 2010; Mier et al., 2007). These studies illustrate the effect that attitudinal familism may have on participants who place higher priority on the needs of the family above their own need for PA. Overall, the consistency of results found in these studies pertaining to the precedence of family needs above self supports further and more direct examination of attitudinal familism as a variable in future PA studies with MAW.

Close proximity between homes. Rodriguez and colleagues (2007) suggested that living in close proximity to family members can play an essential role in upholding and maintaining cultural values for MAW. Although their study of 248 MA men and women did not measure the proximity between the homes of participants and their relatives, proximity was identified as a potential reason for sustaining cultural values. Participants who identified strongly with the Mexican culture reported greater family support (Rodriguez, Mira, Paez, & Myers, 2007). Other studies have shown that the burden that Latinas felt in caring for their children can also be shared with family members or relatives if they live in close proximity, making it easier for participants to engage in PA (Evenson et al., 2002; Skowron et al., 2008). The problem of lack of childcare if relatives do not live close by can be further compounded by a

lack of trust in not allowing those who are outside of the family to care for their children (Evenson et al., 2002).

The close proximity between the homes of participants and their relatives was specifically discussed in a study with 122 women who were either recent Mexican immigrants or of Mexican origin living in Los Angeles (Zambrana, Silva-Palacios, & Powell, 1992). Interestingly, US-born MAW or those who immigrated to the US when they were 10 years old or younger were shown to live closer to relatives and have a larger support system as a result (Zambrana et al.). Results from another study conducted in Texas showed a changing pattern among MA families, in that family members are increasingly moving away and are not able to visit each other often because they no longer reside in close vicinity to each other (Williams, 1990). Although some Latina participants in a study overcame the lack of family support for PA by either engaging in PA at home or by involving their children in PA by going to parks (Skowron et al., 2008), the challenge of engaging in PA still confronts many MAW.

Desire for family reciprocity. Family involvement is identified as a cultural value held by individuals in Latino populations that can influence levels of PA (Evenson et al., 2002). Family involvement can be facilitated through family reciprocity (Steidel & Contreras, 2003) among MAW. Family reciprocity can occur when grown children provide social support for their aging parents in return for financial contributions received and time spent together in shared activities during early childhood years (Silverstein, Conroy, Wang, Giarrusso & Bengston, 2002). However, time spent providing social support and caring for aging parents can result in women having less time to engage in PA. Results in a study involving 23 Hispanic women showed that they did not engage in PA because they felt obligated to care for their parents (Im et

al., 2010). The obligation to care for the family can hinder PA if mutual giving and receiving for the benefit of each other is not attained.

Honor of the family name. Honoring the family name is considered a key component of familism among various ethnic groups including Hispanics (Schwartz, 2007). This cultural value is strongly emphasized as a component of attitudinal familism among Latino populations, and pertains to the avoidance of engagement in any behavior or activity that does not protect the family name (Steidel & Contreras, 2003). Hence, in an effort to maintain loyalty and to bring honor to the family name, participants may choose to care for their parents and other members of the household, rather than caring for themselves by engaging in PA. In a qualitative study conducted with 17 MA families that included grown children, John and colleagues (1997) found that the adult children demonstrated family involvement by caring for their parents, and wanted to avoid the shame and embarrassment that would come from not doing so. This commitment to provide care for their parents may stem from not only a desire to avoid shame but also a sense of loyalty and family institution (John, Resendiz, & De Vargas, 1997).

Apart from abstaining from PA in an effort to avoid being viewed negatively by those within their culture, MAW may also choose to refrain from PA if they perceive that only men should engage in PA (Evenson et al., 2002) and feel that PA is not culturally appropriate for women (Juarbe et al., 2003). Specifically, results of a the study by Juarbe and colleagues with 51 immigrant MAW showed that viewing PA as a means to improve body image or physical shape was not culturally supported . Participants believed that married women who have children should not be concerned about their physical appearance. Hence, cultural value placed on honoring the family name and avoiding shame may play a significant role on whether or not MAW choose to engage in PA.

Attitudinal familism related to honoring the family (e.g., upholding the family name by not doing anything shameful) may be influenced by generational status in the US as exemplified in a study involving 125 Latino men and women (Steidel & Contreras, 2003). In this study, second-generation participants reported feeling less obligated to uphold the family name than their first-generation counterparts. This decrease in familial honor found in the succeeding generation could mean that it is less common or less valued in the second generation suggesting that it is important to further examine this component of attitudinal familism.

Based on the relevance of the precedence of family needs above self (Martinez et al., 2009; Mier et al., 2007), the close proximity between homes (Evenson et al., 2002; Skowron et al., 2008), the desire for family reciprocity (Evenson et al., 2002), and the protection and honor of the family name (Juarbe et al., 2003), more PA studies focusing on attitudinal familism among MAW are needed to gain further insight into the prevalence and extent of these issues (Steidel & Contreras, 2003). Considerations related to the perceptions of household responsibilities and caregiver roles, viewed within the context of the physical environment (Evenson et al., 2002; Fleury et al., 2009), along with the lack of partner support (Juarbe et al., 2003), and attitudinal familism (Martinez et al., 2009), underscore the need to further investigate these concepts as they apply to support for PA among MAW.

Individual Characteristics

Several individual characteristics have been identified as influences of PA levels of MAW (Dergance et al., 2005). These individual characteristics include age (Ewing et al., 2003), BMI (Cossrow & Falkner, 2004), chronic health conditions (Cromwell & Berg, 2006), employment status (Crespo et al., 2000), and acculturation (Sundquist & Winkleby, 1999; Vella, Ontiveros, Zubia, & Bader, 2011).

Age. Hispanic adults 18 years and older are less likely than their non-Hispanic counterparts to engage in PA (44 %, 56%) (The Office of Minority Health, 2013a). Evidence found in numerous studies involving Hispanic/Latino and MAW support that age is an important influencing factor on PA. Findings from a Behavioral Risk Factor Surveillance System telephone survey of 206,992 participants, including Hispanic men and women, showed that the likelihood of engaging in LTPA decreased with older age (Ewing et al., 2003). Similarly, variations of PA by age were found in other studies (Ortiz-Hernandez & Ramos-Ibanez, 2010; Wilbur et al., 2003). A study conducted with 300 primarily Mexican-born, Spanish-speaking participants showed that younger Latinas engaged in higher levels of PA than those who were older (Wilbur et al., 2003). Younger adults were similarly more likely to participate in PA in a study with 38,746 MA adults (58% women) (Ortiz-Hernandez & Ramos-Ibanez, 2010).

Participants in a study conducted with 23 Hispanic women aged 40 to 60 years stated that they did not see the need for increased PA (Im et al., 2010), suggesting that not recognizing the need for PA can also influence PA behaviors. Results of a qualitative study including seven Hispanic women have shown that those who were both young and employed reported that they found it challenging to fulfill their roles as both caregiver and provider for the family (Fleury et al., 2009).

In contrast, results of a study conducted with 903 Hispanic and non-Hispanic adults ages 55 to 80 years, predominantly women, showed that while non-Hispanic White women had decreased productive PA (e.g., employment and homemaking) after age 63, Hispanic women had decreased productive PA at a slightly younger age that stabilized after reaching age 70 (Swenson, Marshall, Mikulich-Gilberston, Baxter & Morgenstern, 2005). However, another study that reviewed the history of occupational, leisure time and household activities in 51 MAW

aged 50 years and older revealed through in-depth interviews that participants had engaged in a lifelong pattern of physical inactivity (Cromwell & Berg, 2006). Importantly, differences identified in reports of decreased PA at a younger age and an overall pattern of sedentary behavior may be related to age of women interviewed. Since women were ≥ 50 years old and were asked about the activity levels over their life span, it is possible that they may have had difficulty in recall. However, variations found in activity levels among older and younger participants across studies indicate that it is important to continue to examine age in future studies to determine whether or not and to what extent it influences PA among MAW.

BMI. Obesity, defined as a BMI ≥ 30 , measured by weight divided by squared height, has been shown to be associated with less PA (AHA, 2015h). The increased prevalence of obesity among MAW was highlighted in a study of men and women of various ethnicities from the NHANES III (1988 to 1994) and the NHANES IV (1999 to 2000) (Cossrow & Falkner, 2004). The higher rates of overweight and obesity found in MA populations demonstrate the importance of considering weight when examining PA in MAW (Bowie et al., 2007). Results from a study of 68,500 adults that included Hispanic men and women showed that obesity and a lack of PA were associated with an increased risk for CVD (Sullivan et al., 2005). Even though this study did not establish a causal relationship between obesity and cardiovascular risk, the associated risk between these two factors is sufficient to establish the need to include weight in future studies that examine PA among MAW.

Chronic health conditions. Existing chronic health conditions or comorbidities of individuals can limit their engagement in PA (Crespo et al., 2000). For example, PA can be limited by the presence of comorbidities, such as diabetes, hypertension (Mouton, Calmbach, Dhanda, Espino, & Hazuda, 2000), and arthritis (Vaughn, 2009). Pain resulting from chronic

health conditions (e.g., arthritis) leads to less engagement in PA among adults living in the US (CDC, 2014c). An examination of PA community- and individual-level programs among older adults revealed that PA can improve the severity and progression of disability (Satariano & McAuley, 2003). However, results from a national database with over 30,000 adults of various races/ethnicities including Hispanics (11%) showed that 43% reported having limited PA attributable to arthritis-related pain (CDC, 2011a).

Results from a large national survey of 68,500 US adults demonstrated that a lack of PA and obesity are highly associated with comorbidities pertaining to diabetes and CVD (Sullivan et al., 2005). Diabetes, shown to exist disproportionately among MA men and women (The Office of Minority Health, 2014b), is highly likely to occur as a chronic health condition. Results from a meta-analysis and systematic review of 18 studies (81% to 95% white men and women), showed that a high incidence of comorbidities is associated with overweight and obesity (Guh et al., 2009). Comorbidities, such as CVD associated with obesity (Poirier et al., 2006), may result from a lack of PA.

A qualitative study with 143 participants that included MAW reported that the presence of chronic illnesses negatively influenced their engagement in PA (Juarbe et al., 2002). The importance of perceptions of health and their influence on PA is demonstrated by a review involving African American, White, Native American and Latina women showing that those who perceived themselves to be healthy were more physically active (Eyler et al., 2003).

Employment status. Mixed findings have been reported about the influence of employment on PA. Research has shown that MAW experienced decreased levels of LTPA compared to women of other ethnicities regardless of their employment status (Crespo et al., 2000). In a small qualitative study with Latinas, participants reported that having a job away

from home created time constraints that prevented them from engaging in PA (Vaughn, 2009) . However, even though women may have decreased levels of LTPA, they may still be physically active while working or performing household duties (Marquez & McAuley, 2006a).

Several studies that included MAW have shown that employed participants identified time constraints as an important barrier preventing them from engaging in PA (Juarbe et al., 2002; Martinez et al., 2009; Skowron et al., 2008). Time constraints resulted from time spent accomplishing their occupational duties, while still fulfilling their caregiver responsibilities in an effort to support their maternal and spousal roles at home (Juarbe et al., 2002). Importantly, results of an older study conducted with 43 couples to examine changes that occurred in MA families have shown that employment influenced the role of women within the home (Williams, 1990). A shift in the traditional role of women being primarily responsible in sharing household duties with their husbands was observed among professional (e.g., teachers and nurses) working MAW. However, Williams did not find this trend to occur among those who were less educated and working in non-professional jobs.

Acculturation. Acculturation is a broad and multifaceted construct relating to changes in behavior, language, attitudes, lifeways, and values that occur from sustained interaction between different cultural groups, with greater acculturation reflecting a higher level of integration or assimilation (McDermott-Levy, 2009). Acculturation has been shown to influence health behavioral changes among Latino populations (Guinn, Vincent, Lin, & Villas, 2011; Hunt, Schneider, & Comer, 2004). Balcazar and colleagues (2001) operationalized acculturation with a measure of several factors (e.g., language, country of origin, current friends, and/or ethnic pride of participants). However, other studies have measured acculturation in other ways, often focusing on language (Guinn et al., 2011).

In a large study involving participants ($N=45,078$) from 23 states within the US, that measured acculturation by language, results showed that PA was significantly lower among Spanish-speaking participants, compared to those who were English-speaking (DuBard & Gizlice, 2008). The Spanish speakers, who may have been more recent immigrants to the US, reported less access to preventive care than their English-speaking counterparts. Important acculturation factors including language barriers can lead to decreased access to preventive care among Latino/Hispanic populations (The Office of Minority Health, 2014b) and an inability to engage in PA programs. Acculturation has also been shown to influence LTPA behaviors among MAW. Crespo and colleagues (2001) found that English-speaking MA adults born in the US engaged in higher levels of PA than those who did not speak English. However, besides language and country of birth, these studies did not include other important aspects of acculturation that may influence engagement in PA in these populations. For example, current friends and ethnic pride, factors identified in other studies as influencing health behaviors (Balcazar et al., 2001), were not examined. This is a vital aspect of acculturation, because some studies have shown how friends and family can provide social support to enhance PA among MAW (Marquez & McAuley, 2006b; Skowron et al., 2008). For instance, a cardiovascular health study with 232 MAW that examined ethnic pride (degree of proud feelings that participants experienced because of their ethnicity) as one component of their acculturation status, showed that ethnic pride was correlated with decreased diabetes and metabolic syndrome (Dirk de Heer, Balcazar, Lee Rosenthal, Cardenas, & Schulz, 2011). In a study involving 1,005 Latino men and women, acculturation was found to be strongly correlated with obesity (high BMI), indicating that as acculturation increased so did BMI (Hubert, Snider & Winkleby, 2005).

It is possible that those who lived in the US longer and were more acculturated may have had increased fat and sugar consumption and/or decreased PA.

Conflicting results have been found in two studies that measured acculturation by language alone. Although participants in one study (N=438) showed no difference in PA regardless of levels of acculturation (Guinn et al., 2011), the other sample (N=379) reported increased PA and LTPA with higher acculturation (Guinn & Vincent, 2008). Findings from the latter study, which included Latino men and women living in border regions, suggested that a lack of association between acculturation and levels of PA may be influenced by the close proximity between border settings and Mexico. Hence, less acculturated individuals may be less likely to engage in at-risk health behaviors because they reside in communities that are not acculturated (Guinn et al., 2011). Similarly, a review of studies conducted with immigrant women from Mexico has shown that less acculturated MAW may have better health outcomes (e.g., higher birth weight of newborns) than their more acculturated counterparts (Callister & Birkhead, 2002).

Further inconsistencies were found between two additional border studies conducted with MAW. One study examined acculturation and the risk for CVD among 141 MAW, finding that those who reported increased consumption of vegetables, fruit, and fiber and had increased levels of PA were also more acculturated and had decreased risk for CVD (Espinosa de Los Monteros, Gallo, Elder, & Talavera, 2008). However, another study involving 60 MAW found that, although no differences in PA were reported among participants with varying levels of acculturation, those who were more acculturated to the US had an increased risk for metabolic syndrome regardless of their PA levels (Vella et al., 2011). In both studies, acculturation was measured by country of origin, number of years living in the US, and language, decreasing the

likelihood that variations in the results could have occurred from acculturation being measured differently in the two studies. Baseline data from a third study revealed a negative relationship between PA and Latina orientation (i.e., less acculturated) indicating that those who were less acculturated performed less PA (Barrera, Toobert, Stryker & Osuna, 2012).

In an examination of PA patterns among Latino populations ($N=29,361$), Ham and colleagues (2007) explained that the association of PA with acculturation (measured by language, length of stay, and age of immigration to the U.S.) varied according to types of PA (e.g. household activities and LTPA). This examination of data from four national health studies showed that as participants became more acculturated, they demonstrated increased household and leisure time PA. However, participants were also shown to engage in less transportation and occupation-related activities (e.g., heavy lifting) with increased acculturation. Additionally, decreases in activities in one PA domain (transportation), may have been compensated for by increased activities in another PA domain (household) (Ham et al., 2007). Although these measurements are useful, future studies that include information on current friends and ethnic pride can offer a multifaceted view of acculturation and potentially provide insight on acculturative variations found in past studies.

Summary and Recommendations

Both the high rates of obesity (The Office of Minority Health, 2013a) and increased risk for CVD found among MAW (Los Angeles County Department of Public Health, 2010a) accentuate the importance of targeting PA as an important lifestyle behavioral strategy to prevent CVD. Focus on perceived overall PA among MAW is driven by variations found between self-reported and objectively measured PA and is designed to determine if inclusion of various components of PA (e.g., occupation, transportation, and household activities) in addition to

LTPA may lead to different results. Identification and examination of several factors (the physical environment, partner support, and attitudinal familism) and individual characteristics (age, employment status, acculturation, BMI, and number of chronic conditions) found to be associated with PA among MAW has provided a foundational basis supporting the need to further investigate these relationships in this dissertation.

Results across studies have shown that the perceived PA of MAW may be influenced by their perceptions of the physical environment, partner support, and attitudinal familism. Unsafe neighborhood conditions (Brownson et al., 2004; Doyle et al., 2006; Evenson et al., 2002), having low partner support (Fleury et al., 2009; Juarbe et al., 2003) and strong attitudinal familism values (Steidel & Contreras, 2003) can all lead to lower levels of PA in this population. Although there may be variations in design of some studies, overall results have shown that increased age (Ewing et al., 2003; Wilbur et al., 2003), high BMI (Bowie et al., 2007; Sullivan et al., 2005), having an increased number of chronic health conditions (Sullivan et al., 2005; CDC, 2014c), lack of employment (Martinez et al., 2009; Vaughn, 2009) and being less acculturated (DuBard & Gizlice, 2008) are associated with decreased levels of PA among MAW. Across qualitative studies a lack of support from family and partners has been commonly reported by participants as a factor influencing their PA levels (Im et al., 2010; Martinez et al., 2009; Skowron et al., 2008). Particularly, studies have shown how partner support may influence PA among MAW (Juarbe et al., 2003; Martinez et al., 2009). Although the aforementioned studies did not focus exclusively on partner support towards PA, they provide a foundation that strongly supports examination of this concept. In the present study the specific influence of partner support based on the perceptions of participants is explored.

To date, no single quantitative study has been identified to specifically target partner support of PA while simultaneously examining the influences of ecological and sociocultural factors on PA levels among MAW. Although prior research has explored perceptions of the physical environment (Martinez et al., 2009; Skowron et al., 2008), aspects of attitudinal familism (Martinez), and individual characteristics (Martinez) as separate influential factors associated with PA of participants, the collective knowledge gained from these studies helped in the establishment of the ecological context for this dissertation. Thus, a theory-based and comprehensive approach is used in the dissertation study to investigate influences of the perceived physical environment, perceived partner support, and attitudinal familism in conjunction with the individual characteristics of MAW.

Chapter 3

Theoretical Framework

Theoretical frameworks have been used extensively to provide guidance for research studies on healthy lifestyle behaviors of individuals in diverse populations (Allegre, Therme, & Griffiths, 2007; Keller et al., 2011; Satariano & McAuley, 2003). A review of health promotion studies has shown that a variety of theoretical frameworks and models (e.g., social-ecological) have been used in Latino populations (Pekmezi et al., 2010), including Mexican American women (MAW). Understanding that physical activity (PA) is a complex health behavior that can be affected by various social support and environmental factors (Sallis & Owen, 2002), suggests that a multidimensional approach as supported by an ecological framework is appropriate for this dissertation. Previous studies examining influences on PA have applied an ecological framework (Fitzgerald & Spaccarotella, 2009).

Ecological Framework

An ecological framework, also referred to as an ecological model, is used to target multiple social, environmental, and cultural forces that can influence health behaviors (Crosby, Salazar & DiClemente, 2013). Crosby and colleagues (2013) described the basic premise of an ecological model as an interrelationship between the determinants of health behaviors (e.g., diet and exercise) and health outcomes (e.g., cardiovascular disease [CVD] and diabetes). Application of an ecological approach is demonstrated by the social-ecological model presented as a complex interplay of influences related to societal, community, relationship and individual factors (CDC, 2015c) that can be targeted for CVD prevention. A description of the historical roots of the ecological framework is presented, beginning with Bronfenbrenner's original ecological model, followed by an expansion of the model in the writings of McLeroy and

colleagues (McLeroy, Bibeau, Steckler, & Glanz, 1988); and finally describing Fitzgerald's and Spaccarotella's (2009) application of the ecological model in the area of lifestyle behavior.

Bronfenbrenner's ecological model. Bronfenbrenner's ecological model, developed in the 1970's, primarily upheld the view that subsystems within the environment provide social support and guidance in human development (Bronfenbrenner, 1994). Though commonly recognized as the inventor of the model, Bronfenbrenner claimed his work was influenced by investigations from various disciplines dating back to the year 1870 (Bronfenbrenner, 1994). In focusing on the ecology of human behavior, Bronfenbrenner proposed a broad research approach. This approach encompasses a progressive accommodation that occurs during human growth within multiple changing environmental contexts (Bronfenbrenner, 1977).

Crosby and colleagues (2013) acknowledged Bronfenbrenner's ecological approach as widely used in social science research and practice including health promotion (Crosby, Salazar, & DiClemente, 2013). Bronfenbrenner's (1977) classic article described how the ecological model primarily focuses on several interrelated factors, influencing social behaviors at four distinct levels that extend beyond individual level factors: the macrosystem, the exosystem, the mesosystem, and the microsystem.

The macrosystem. The larger macrosystem pertains to general patterns of values and cultural beliefs at the political, social, educational, economic, and legal levels; these are concretely manifested in different settings (e.g., workplace, school, and home) at the exo-, meso-, and microsystem levels (Bronfenbrenner, 1977). Bronfenbrenner posited that the macrosystem provides a societal blueprint that is characteristically represented by options in the life course, hazards, opportunity structures, various bodies of knowledge, lifestyles, and customs embedded in a range of subsystems described as follows (Bronfenbrenner, 1994).

The exosystem. The exosystem refers to major institutions in society that impact individual settings and pertains to the specific effects of structures such as the media and governmental agencies at the national, state, and local level affecting an individual's life (Bronfenbrenner, 1977). The exosystem consists of at least two settings or places, where the processes and linkages occurring between these settings (e.g., relation of events that occur in a child's home and parent's workplace), indirectly influence individual development (Bronfenbrenner, 1994).

The mesosystem. The mesosystem consists of interrelations taking place between microsystems in various settings that can potentially change interactions or activity patterns between them (Bronfenbrenner, 1977). Examples of mesosystems are processes and linkages existing at school and at home (e.g., relationships of a child at day care or relationships between siblings) or in the workplace (Bronfenbrenner, 1994).

The microsystem. Present at the microsystem level is a complexity of relations that an individual experiences, pertaining to his or her role within the immediate setting (Bronfenbrenner, 1977). This includes the reciprocal processes resulting from responses created from the stimulation that takes place between individuals (Bronfenbrenner, 1977). For example, experiences that occur in face-to-face settings can influence the developing individual's interaction and engagement in activity (Bronfenbrenner, 1994).

Eisenmann and colleagues (2008) recommended a multilevel, collaborative, and interdisciplinary approach in a health program for childhood obesity when they incorporated Bronfenbrenner's ecological model and various environmental systems. They identified community, school, and family-focused interventions that integrated the role and support of macrosystem (history, laws, culture, economic system, and social conditions), exosystem

(neighborhoods, extended family, work environment of parents, school board and the mass media), mesosystem (relationships within family, classroom, peers and siblings), and microsystem levels (complexity of relationships in the mesosystem) (Eisenmann et al., 2008). Bronfenbrenner promoted new ecological directions in human developmental research (Bronfenbrenner, 1977), warranting the expansion and further conceptualization of subsystems present in the model.

McLeroy's extension of the ecological model. McLeroy and colleagues (1988) identified several variations of ecological models used in health promotion programs focusing on assessment of health behaviors, health problems, community psychology, and integration of environmental and individual factors in the study of human behavior (McLeroy et al., 1988). However, the premise of these ecological models can be traced back to Bronfenbrenner's model. In an extension of Bronfenbrenner's ecological model, McLeroy and colleagues (1988) focused on health promotion by reconceptualizing the macro-, exo-, meso-, and microsystem levels. These levels were renamed into five different levels: public policy, community factors, institutional factors, interpersonal processes and intrapersonal levels, to encompass social networks and systems existing in the larger community (McLeroy et al., 1988). Following are similarities noted between McLeroy's expanded work and Bronfenbrenner's ecological model.

Public policy pertains to regulatory policies and laws existing at the national, state, and local levels that are similar to parts of the macrosystem level (containing rules, regulations and laws), and the exosystem level (including national, state, and local governmental agencies) of Bronfenbrenner's ecological model. Community factors are the formal and informal relationships displayed among institutions and organizations, and are similar to the exosystem level (concerning main institutions of society). Likewise, organizational characteristics of social

institutions (e.g., management support) are determined by regulation and rules of operation and are also similar to the exosystem level. Interpersonal processes involve group support systems and networks that are social in nature, and resemble the mesosystem level (including interrelations among main settings). Finally, intrapersonal factors refer to individual characteristics, formed during development, corresponding to what occurs at the microsystem level (involving complex relations surrounding the developing person) (McLeroy et al., 1988).

According to McLeroy and colleagues (1988), a major drawback of ecological models is that they do not provide sufficient specificity needed to address specific health problems. In other words, using ecological models to examine health problems may lead to difficulty in identifying particular influential sources, since various interrelated factors can influence health behaviors (McLeroy et al., 1988). However, Fitzgerald and Spaccarotella (2009) demonstrated how an ecological model can be applied to specific health problems by focusing on influencing factors at various levels of the model.

Application of the ecological model by Fitzgerald and Spaccarotella. Fitzgerald and Spaccarotella (2009), focusing on various levels of the ecological model, presented a review of barriers to healthy lifestyle behaviors, and showed how they can be improved. Emphasis is placed on the ecological model perspectives of Fitzgerald and Spaccarotella, because it is the approach that most directly drives this dissertation.



Figure 1. From Fitzgerald and Spaccarotella (2009) An Ecological Model of Factors affecting Diet and Physical Activity.

Present in the ecological model of factors affecting diet and PA are four nested levels as shown in Figure 1. From the outermost to innermost level are: macro/public policy, community/institution, interpersonal, and intrapersonal. Macro level factors pertain to federal, national, and local policies that target zoning regulations, media advertisement, and food pricing. Community factors include those operating on an institutional level, such as school and workplace. Interpersonal factors include social support and culture, whereas intrapersonal factors are individual characteristics (knowledge, skills, perception, motivation, etc.) that can be targeted to enhance diet and PA levels (Fitzgerald & Spaccarotella, 2009).

This multi-factorial application of an ecological model by Fitzgerald and Spaccarotella (2009), provides a broad approach for exploring lifestyle behaviors (diet and PA) allowing examination at each level to address a combination of individual, social, and environmental factors (Fitzgerald & Spaccarotella, 2009). The application of the ecological model by these

authors will be followed for the purposes of this dissertation. This theoretical approach will acknowledge multilevel factors related to PA in MAW, providing a relevant approach that considers factors ranging from individual to environmental levels. This ecological perspective will aid the attempt to better understand influences on PA levels in this population.

Application of the Ecological Model in Dissertation Study

The theoretical model for this dissertation study (shown in Figure 2) postulates that specific variables (e.g., perceived physical environment) represent constructs existing within each level of the model (e.g., community/institutional). These variables interact with variables from other levels of the model forming relationships that can influence PA.

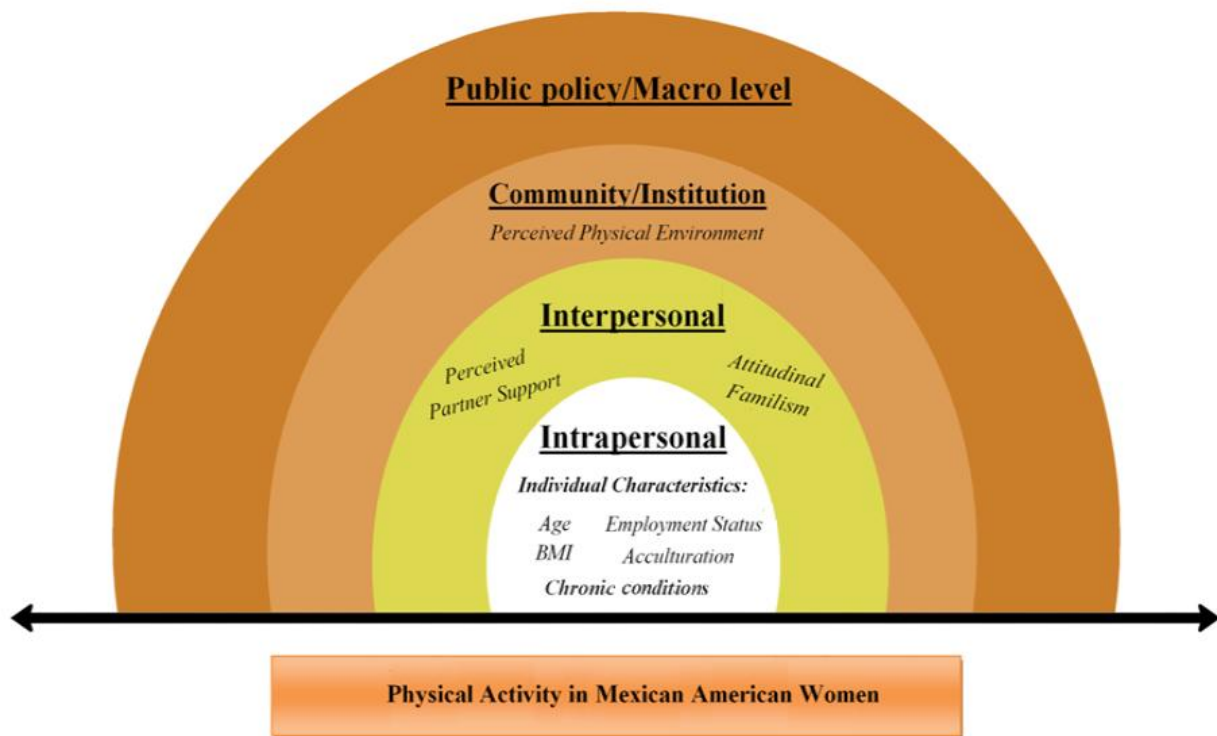


Figure 2. Applied from an Ecological Model of Factors influencing Diet and PA (Fitzgerald & Spaccarotella, 2009).

This theoretical model consists of four major levels that begin with the outermost macro level. Although the macro level is not measured in this dissertation, it remains in the model to acknowledge importance of its influence. For instance, actions related to legislation, regulation, and policymaking, though sometimes unintentional, can influence health behaviors (Sallis & Owen, 2002). However, change in public policy requires political involvement (Sallis, 2002) and cannot be easily targeted to create behavioral changes in participants. This level will not be assessed, but the findings of this study are expected to have implications for macro level policies.

Beginning from the second outermost semicircular arc and moving towards the center of the model are the following subsections used to describe and explicate how similar constructs have been applied from an ecological model. These include the community/ institutional level, interpersonal level, and intrapersonal level; and relationships of variables within the constructs.

Community/Institution Level. Branching from the community level is the perceived physical environment variable, pertaining to physical neighborhood characteristics. More specifically, these factors include residential density (different types of houses such as apartment, single family, etc.), diversity of land mix (time it takes to walk to nearby businesses and other facilities), and access to services (easy walking distance to locations). Additional factors are street connectivity (intersections), areas for walking/cycling, aesthetics/neighborhood surroundings (trees and attractive surroundings), traffic hazards (speed limits), crime (safety in walking), difficulty parking, and major barriers preventing walking, such as hilly areas.

Interpersonal Level. The perceived partner support variable branches from the interpersonal level of the model. Partner support is based on the participants' rating of support for PA from their partners. It focuses on how much partners exercise, offered to exercise with them, and provide helpful reminders encouraging them to exercise. Further details include how much they

facilitate the participant's exercise by changing their schedule; talk to them about exercising; complain or criticize when they exercise; reward them for exercising; plan for their exercise during recreation; plan other activities around their exercise time; talk with them about how they can exercise more; and discuss their enjoyment in exercising. Also branching from the interpersonal level is attitudinal familism, used to examine the influence of family obligations on the PA levels of participants. Family support, interconnectedness, and reciprocal support received from the family, along with honor and self-sacrifice for the benefit of the family are particularly emphasized.

Intrapersonal Level. At the intrapersonal level are the individual characteristics of participants including age, BMI (an evaluation of body weight in terms of height), chronic conditions, employment status (full, part time, or not employed) and acculturation. Acculturation is based on language, country of birth, place of early childhood, ethnicity of current friends, and being proud of one's ethnicity.

Relationships of variables within the constructs. Multi-level factors and interrelationships are formed by various combinations that influence the dependent variable: PA levels of MAW investigated in this study. The independent variables: physical environment, partner support, and attitudinal familism are examined in conjunction with individual level characteristics, within the context of their respective levels of the model. Relationships between variables of the study are represented as hypotheses that are tested to better understand their influences on PA among MAW. Factors present at various levels of the model for this study, and how they are interrelated, are exemplified as follows.

PA, considered an intrapersonal level factor, is influenced by a number of (variables) present at the community, interpersonal, and intrapersonal levels within the model. Actual PA

may also be influenced by individuals' perceptions (intrapersonal level) of their PA levels. Past studies with samples of Hispanic women, including those of Mexican descent, report low levels of leisure time PA (LTPA) (Marshall et al., 2006) and overall PA (Cromwell & Berg, 2006). However, evidence based on accelerometer data has shown that activity levels differed by age group among Hispanic women including a subgroup of MAW (Hawkins et al., 2009), and many MAW are physically active (Koniak-Griffin et al., 2013).

Results from the 2003-2004 National Health and Nutrition Examination Survey showed that middle aged (40 to 59 years old) Hispanic women were more physically active than their younger or older counterparts (Hawkins et al., 2009). Koniak-Griffin and colleagues (2013) examined cardiometabolic characteristics, also known as risk factors for CVD, and PA levels in a study involving Latino women. Baseline data from this randomized controlled trial showed that in spite of overweight/obese status, 21% and 27% of participants were classified as sedentary and active, respectively (Koniak-Griffin et al., 2013). Differences found across studies between self-reported and objectively measured PA among MAW indicate that further assessment of overall self-reported PA can help provide important insights on PA levels in this subgroup.

The next section presents a review of past research on PA that applied an ecological framework. These studies further illustrate the relationships between variables present within the constructs at the various levels of the model.

Ecological Framework: Application in PA studies

Past research has identified use of ecological models as appropriate for PA studies. Sallis and Owen (2002) pointed out that accounting for intrapersonal factors alone to examine influences on PA is not sufficient, and further expansion should be done to include environmental influences. Several types of ecological models (e.g., behavior-specific models)

are shown to be applicable for PA studies, in that they target health behaviors by focusing on influences of the environment (Sallis & Owen, 2002). Further, current evidence suggests that a socio-cultural approach extending beyond individual and interpersonal level factors, provides a fitting theoretical framework for PA studies with Latino/Hispanic populations (Elder, et al., 2009). Previous research has exemplified how various types of ecological models can be used to target multiple factors that can influence PA in Latino and MA populations (Pekmezi, Marquez & Marcus-Blank, 2010; Larsen, Pekmezi, Marquez, Benitez & Marcus, 2013).

In a systematic review of 31 health promotion intervention studies involving predominantly immigrant MAW, the socio-ecological model was identified as one of the theoretical frameworks used to examine PA and diet together and as separate entities (Pekmezi et al., 2010). In addition, other theoretical frameworks were identified in these studies (e.g., social cognitive theory; cognitive behavioral theory). Significant improvements in PA and diet behaviors were reported across studies applying various models. Findings also indicated that a lack of transportation (community-level) and child care (intrapersonal-level based on cultural beliefs) were the most common reasons for not attending diet and PA programs. Other variables influencing PA were identified from different levels of the ecological model: partner support and time constraints (interpersonal-level), physical safety (community-level), and fatigue (individual-level) (Pekmezi et al., 2010). Overall, the findings of this review support the appropriateness of using an ecological approach to identify barriers and facilitators to PA so that these areas can be targeted.

A more recent review of studies using an ecological approach to examine PA among Latino/MAW has also found multiple factors influencing PA at various levels of the model (Larsen et al., 2013). Although a few community-level (crime and traffic) and macro-level (fear

of immigration) factors were identified, most influences were related to the interpersonal (social support, care-giving, time, family obligations, and household responsibilities), sociocultural (gender roles, appropriateness of PA for women, and discouragement to exercise) and environmental (crime and fear of walking) levels. It is worthwhile to note that across reviews, although influences of PA were examined among different Latino subgroups, multiple influential factors on PA were found existing at different levels of the ecological model.

An assessment of a PA promotion program involving MAW also revealed several influencing factors at various levels of the social-ecological framework used (Parra-Medina & Messias, 2011). An examination of environmental (e.g., unsafe physical environment, traffic speeding), social support (partner support) and sociocultural factors (e.g., family responsibilities, time constraints) revealed important influences on PA. Fear of immigration (macro-level) and lack of English proficiency (intrapersonal-level) were reported as additional factors preventing women from being physically active. Results showed that the multiple influencing factors existing at various levels of the ecological model can negatively influence PA among MAW if they are deterred from walking in the neighborhood or to nearby parks. It is important to note that, although this study involved assessment of a single program, multiple factors were identified at different levels of the ecological model, indicating how such an approach may be suitable for further examination of PA among MAW.

Individual studies conducted with Latino women using the ecological model of health behavior and social-ecological model have also identified the important influence of social support on PA (Skowron, Stodolska & Shinew, 2008; Martinez et al., 2009). Results from a study conducted with 269 women has identified through in-depth interviews that multiple factors influence LTPA. These include environmental (safety, transportation, unattended dogs, bad

weather) and cultural factors (child care, approval for PA from family and friends). Findings showed that although most women reported having high levels of support from family and friends, participation in PA was still low. Yet the existence of multiple factors influencing PA at the different levels of the ecological model is noteworthy, as it points to the numerous influences that can be identified when such an approach is used (Skowron et al., 2008).

Examination of barriers and facilitators of PA among 25 Latinos, predominantly Mexican-born women, using the social-ecological model showed multiple factors influencing PA that exist at the environmental (traffic-related and dogs), sociocultural (fear of immigration, neighborhood safety), and individual levels (language, time, household/family responsibilities, social support) (Martinez et al., 2009). Importantly, in this study even though categorization of influencing factors varied (i.e., neighborhood safety is considered sociocultural instead of environmental), yet multiple factors influencing PA are identified despite these variations. .

A social ecological theory in nursing research. A social ecological theory has been used in community health nursing research to treat and manage Type 2 diabetes (Whittemore, Melkus, & Grey, 2004). Intrapersonal, interpersonal, institutional, community, and public policy factors of the model were targeted to identify challenges and implement interventions to focus on the disease. Whittemore and colleagues (2004) emphasized the need to create programs that are specific and realistic when using an ecological perspective. Such an approach was demonstrated through the implementation of exercise programs using multilevel strategies. As an example, intrapersonal (offer exercise classes), interpersonal (incorporate focus group findings to discuss strategies to promote PA), institutional (collaborate with businesses to distribute brochures showing the benefits of exercising), community (promote exercise options during community

events), and public policy (collaborate with government officials to improve exercise facilities) levels were used to show how increased PA can be promoted.

Summary

Numerous researchers have consistently viewed the ecological framework as useful in examining social support for human development (Bronfenbrenner, 1977), health behaviors (McLeroy et al., 1988; Sallis & Owen, 2002) and influences on healthy lifestyle promotion (Fitzgerald & Spaccarotella 2009). Overall, systematic reviews and individual studies have examined PA among Latino subgroups using various ecological models. Despite variations in ecological models used and differences in categorization of influencing factors, findings support use of this framework as appropriate in the examination of PA in MAW (Martinez et al., 2009). Although social support has been identified as an important influence on PA across several studies (Skowron, et al., 2008; Martinez et al., 2009; Parra-Medina & Messias, 2011; Larsen et al., 2013), a need exists to examine the impact of partner support as an interpersonal variable within the ecological model in studies targeting MAW.

An ecological model is applied as the theoretical framework for this dissertation study examining variables related to constructs within three levels of the model: the community, interpersonal, and intrapersonal levels. This multilevel approach may enhance understanding of relationships among the perceived physical environment, partner support, attitudinal familism and PA levels of MAW, while considering the important influences of individual characteristics. Finally, the goal of this study is to examine multiple variables influencing PA among MAW through the application of an ecological model to obtain reliable, significant, and meaningful data useful for clinical practice and scientific research.

Chapter 4

Methods and Procedures

Major methodological aspects of this dissertation are supported by the theoretical underpinnings of an ecological framework that includes variables that can influence physical activity (PA). Perceived influences on the PA of Mexican American women (MAW) are examined through variables that are embedded in this ecological framework. The study is described in the following sections within this chapter: (a) overview of research study and specific aims; (b) study design; (c) study sample ($N=112$); (d) procedures; (e) variables of study and measures; (f) pilot testing of selected measures ($n=2$); (g) data management plan; (h) data analysis plan; (i) human subject considerations; and (j) limitations of the study.

Overview of Research Study and Specific Aims

This study examined the relationship between independent variables (perceived physical environment, perceived partner support, and attitudinal familism) and PA. Additional independent variables examined include individual characteristics: age, BMI, chronic health conditions, employment status, and acculturation. Major objectives for this dissertation are summarized in the following five specific aims:

Specific aim 1. To examine the relationships between characteristics of the physical environment and PA levels in MAW.

Specific aim 2. To examine the relationship between partner support and PA levels in MAW.

Specific aim 3. To examine the relationship between attitudinal familism and PA levels in MAW.

Specific aim 4. To examine the relationships between individual characteristics (age, BMI, number of chronic health conditions, acculturation, and employment status) and PA levels in MAW.

Specific Aim 5. To evaluate relative influences of the physical environment, partner support, attitudinal familism, and individual characteristics on PA levels in MAW.

Study Design

A cross-sectional survey design was employed to adhere to the principles of community based participatory research (CBPR). A Community Advisory Board (CAB) was used to provide guidance in all phases of the research. The membership and activities of the CAB are described below.

CAB. Prior to study implementation, a CAB was formed of six bilingual, bicultural members recruited by key stakeholders or other individuals involved in activities at locations of data collection for the study. The CAB members were obtained through referrals from directors and administrative leaders at study locations. At least one member on the board was a non-professional woman with lower economic level to represent participants in the study sample. The members were knowledgeable about how social factors and cultural beliefs can influence the lives of MAW. They were asked to provide feedback on the study design and procedures, including recruitment processes, and how to enhance understanding of the research process and questionnaires.

Following data analysis, the findings were presented to the CAB for the purpose of soliciting their perspectives on interpretation of findings. Input was obtained during four scheduled committee meetings, held for approximately 90 minutes each during the course of the study. As a token of appreciation for their time, each CAB member received a \$25 Target gift

card for each meeting attended. Upon completion of the study, findings were disseminated by the principal investigator (PI) in a presentation to interested community groups referred by program directors and administrative leaders at study sites. A class was held for anyone interested in learning basic strategies to increase PA (e.g., practical ideas that can be implemented at work or at home, such as walking up and down a flight of steps 10 times). These PA strategies were culturally tailored (e.g., simple exercises for unemployed women who take care of their children at home) based on insights obtained from interviews conducted during the study.

Study Sample

Power calculations conducted prior to the start of the study indicated that it would be possible to detect a small effect size for specific predictors at alpha .05 and power 0.80 with a sample of 109 individuals in regression equations for 8 predictors. The actual sample size for the regression analyses ($n = 102$) provided power 0.8 for detecting a small effect size of $f^2 = 0.08$.

Eligibility criteria. Self-identified MAW eligible for the study were living in Southern California, ages 18-64 years, spoke either Spanish or English, were born in Mexico or the US, and were either married or single and living with a partner. These criteria are based on similar PA studies conducted with MAW (DuBard & Gizlice, 2008; Saelens et al., 2003). The age cut-off point is appropriate since benefits for Medicare begin at age 65 (Centers for Medicare and Medicaid Services, 2014), and the health status and health behaviors of participants may then be influenced by their insurance coverage.

Exclusion Criteria. Women who were outside the age parameters of 18 to 64 years or not living with a partner were excluded from the study. It is important to note that those who had been told by a health care professional that they had chronic health conditions that limited their

PA levels (e.g., shortness of breath from heart failure or asthma, chronic pain from arthritis, deficits from a previous stroke) also were not included in the study. Similarly, women who were pregnant or less than 6 weeks postpartum were excluded.

Setting. The study was conducted in Oxnard, California because of its large population of Latinos (74%) found in 2010, with almost half (49.3%) reported to be females in 2010 (US Census Bureau, 2015). Participants were recruited from several sites close in proximity to where MAW reside, including churches, clinics, and other community outreach programs that provide food, clothing, and health screening to MAW. The use of multiple and diverse recruitment sites was intended to minimize potential sample bias that may occur when participants are selected from community health clinics or recreational settings such as public parks. The recruitment sites chosen for this study serve large Latino populations, including Spanish-speaking women of Mexican descent.

Procedures

Approval for this study was obtained from the Institutional Review Board (IRB) of the University of California, Los Angeles Office of the Human Research Protection Program (UCLA OHRPP) (IRB approval # 14-000477). Administrative leaders or directors of agencies provided letters of support granting permission to recruit participants and conduct interviews in their facilities. The study was approved with expedited review (category 7), since it involved minimal risk to participants and focused on perceptions.

Two bilingual, bicultural research assistants (RAs) were hired to assist the PI with recruitment, data collection, and other activities. The RAs were trained to recruit participants using a standardized script, and to perform screening and consent procedures. Detailed

information on the informed consent is discussed later in this chapter. Training also addressed how to minimize biases in administering the questionnaires.

The study procedures included (1) recruitment and determination of eligibility with a brief screening tool, followed by securing informed consent; and (2) administration of the research questionnaires in one-to-one interviews using the participant's preferred language (English or Spanish) conducted in a private area to ensure confidentiality. This was followed by obtaining weight and height measurements for calculation of BMI. The sequencing of procedures was designed to prevent any effect of emotional reactions on responses to questionnaires (e.g., becoming upset when learning about overweight status). A randomly selected subsample of women ($n=16$) were asked to provide an "objective" measure of PA (i.e., pedometer step readings) *prior* to administration of the questionnaires (see section: "Variables of Study and Measures," p. 58).

Two measures used to assess the physical environment and social support received from family, friends, and partners were pilot tested, since previous administration with MAW was not found in the literature review. Procedures involved conducting two separate focus groups for English- and Spanish-speaking women (6 per group), to review the measures in their preferred language. The focus group leader first administered the questionnaires, and then solicited feedback from participants on the clarity and readability of individual items, as well as the meaning of items on the measures. Participants were asked to share their ideas about how to improve the wording to make them more understandable. They were also asked to include conversational words that might help to enhance understanding of items.

Recruitment and enrollment. Women were recruited into the study by posting flyers, "respondent driven" sampling through referrals from other participants, announcements made

during church services and educational programs (e.g., Head Start), and information desks at community events and other public venues. In recruitment sites within selected community locations, either the PI and/or the RAs sat at a display table or information desk on designated days, using a flyer (**Appendix A**) to advertise the research study. Flyers, provided in Spanish and English, briefly described the study eligibility criteria. Prospective participants that met eligibility criteria received further description of the study from the PI or RAs.

Participants were interviewed at the time of enrollment if possible or at a later scheduled time. All interviews were conducted at recruitment sites or at an alternative mutually-agreed-upon location. Those who were to be interviewed at a later date received a flyer with a contact number to call the PI or RA if unable to keep the scheduled appointment. Registration forms requiring the name and preferred language of prospective participants, along with their available times for interviews, were present on the display table when the PI and RAs became occupied interviewing other participants. Instructions for self-registration were provided in both Spanish and English. Prospective participants were asked to complete the forms and then drop them through a small opening at the top of a closed box to maintain confidentiality. Each participant received a \$10.00 Target gift card upon completion of the interview to compensate them for time spent.

Data collection. All questionnaire data were obtained in a face-to-face interview. The RA or PI administered almost all questionnaires to participants to ensure understanding of items and to decrease missing data. Completion of the questionnaires required approximately 30 to 50 minutes of interview time. Questionnaires focusing on non-threatening information (e.g., neighborhood characteristics) were administered first, and those requiring culturally sensitive answers (e.g., partner support) were administered towards the end, to build rapport with the

participants and decrease potential discomfort or embarrassment that might interrupt the interview process. Body weight and height of all participants enrolled in the study were measured after completion of the interviews.

To ensure understanding of questionnaires that utilize polytomous-response options, a small poster for the abbreviated Neighborhood Environment Walkability Scale (NEWS-A) and the adapted Social Support for Exercise Survey (ASSES) was displayed with a visual representation of the scale range (e.g., 1 to 4). A simple verbal explanation of the meaning of each number was provided *prior* to administering the items in order to increase the number and accuracy of responses to questions. Simpler words and explanations previously obtained from the focus group meetings were provided as needed for items that the sample of women found challenging or difficult to understand within questionnaires.

Variables of Study and Measures

Authors of measures were contacted via email and telephone and permission granted to use and adapt the measures to meet the needs of this study. Variables for the study included (a) physical activity, (b) perceived physical environment, (c) perceived partner support, (d) attitudinal familism, and (e) individual characteristics (i.e., age, employment status, acculturation, BMI, and chronic health conditions).

Physical activity. The short version of the International Physical Activity Questionnaire (IPAQ) (**Appendix B**) was used to assess self-reported PA of participants. This instrument has been previously administered to evaluate PA in MAW (Ortiz-Hernández & Ramos-Ibáñez, 2010). Seven “fill in the blank” type questions evaluated PA performed in four main domains: at work; at home and in the yard; while traveling from place to place; and in spare time (reading, visiting friends, lying down or sitting and watching television). These questions were used to

determine the number of days and amount of time (hours or minutes per day) spent engaging in vigorous (e.g., heavy lifting and aerobics) or moderate (e.g., carrying light loads or regularly paced bicycling) type PA, and time spent sitting (e.g., at a desk) (Craig et al., 2003).

Scoring of the Short IPAQ provided classification using metabolic equivalent task (MET) scores that are based on the estimated PA performed in 1 week (Craig et al., 2003). The MET values were assigned based on level of PA. For example, MET values for walking, moderate PA, and vigorous PA are 3.3, 4.0, and 8.0, respectively. MET scores were determined by the MET value multiplied by the number of minutes of activity performed per day on average and the number of days per week.

The Short IPAQ has been administered in 12 different countries including the US, with adequate test-retest reliability (approximately 0.8 in most cases) (Craig et al., 2003). This measure has also been used in studies with MAW (Ortiz-Hernandez & Ramos-Ibanez, 2010; Skowron et al., 2008), indicating appropriateness of the measure in this cultural group. In the current study the Cronbach's alpha for the short IPAQ was 0.7 when 1 question (How much time did you spend sitting?) was deleted, which indicates acceptable reliability (Nunnally, 1978). The question about sitting was deleted because it is the opposite of PA and not related to the other questions in the measure. A random subsample of 16 women completed a self-report instrument on PA and provided pedometer readings. These data were used to calculate correlations between the IPAQ scores and pedometer measures of average daily steps. The strength of the relationship between self-reported and objective measurements of PA obtained from pedometer readings was examined as a form of evaluation of the validity of self-reported PA. A high correlation has been reported between objective measures of PA (i.e., Caltrac activity monitor) and concurrent self-reports of activity (log-based recordings of PA) among Latinos; overall findings support the

reliability and validity of self-report measures of PA (Rauh et al., 1992). A more recent systematic review of the literature revealed that a variety of factors influence correlations between objective measures (i.e., pedometer and accelerometer readings) and self-reported physical activity, depending upon specific instruments and methods used and individuals assessed (Tudor-Locke, Williams, Reis, & Pluto, 2002).

In the present study, the Yamax Digiwalker CW-701 pedometer provided an objective measure of PA over a 7-day period. This device accurately records the number of steps taken per day and time regardless of walking speed and has a 7-day memory for daily PA, the capacity to hold a total cumulative memory for a 2-week period, and a 24-hour clock system that automatically resets at midnight to record data the following day. Additionally, it has a protective cover to prevent accidental resets while worn, and to avoid tampering by young children. These features made it easy to obtain and retrieve stored data.

Participants were asked if they would be willing to wear pedometers and return after a week for interviewing. They participated in this part of the study if they chose a number between 1 and 20 from a box containing slips of paper with numbers from 1 to 112. Random selection of women continued until a total of 20 participants were selected to wear pedometers, unless there was missing data from pedometer readings or dropout from the study. In this case, numbers for those who did not complete this part of the study were returned to the box containing numbers, and newly recruited participants were chosen. The same occurred for any reported lost or stolen pedometers.

Participants were instructed to wear the pedometers for a 7-day period after completion of the entire interview process. After wearing the pedometer they were interviewed again using only the Short IPAQ. This enabled measurement of PA by self-report during the same 7 days,

corresponding to the time period of pedometer use. This approach also helped to provide data on perceived PA both before and after the pedometer was worn to examine if there were any changes in their reported PA. While wearing the pedometer, women were instructed to perform their usual level of PA. To ensure accurate use of the pedometer, the RA demonstrated how to wear the device and provided written instructions with illustrations (**Appendix C**). Similar strategies were used in other PA studies with Hispanic and Latino women (Keller et al., 2011; Koniak-Griffin et al., 2013), using pedometers and accelerometers, respectively. Women were asked to maintain records of their activity, on a specially designed PA log (**Appendix D**) that was made available in both Spanish and English.

Participants were instructed to wear the pedometer at all times during the day, except when showering, bathing, or sleeping. It was emphasized that the pedometer should not be worn by anyone else including children. The PA record sheet was used to record the day of the week, times pedometer was placed on and taken off waist, type of PA engaged in during time worn, and any comments about their PA. A Locator Guide (**Appendix E**) was completed with the participant's name, street address, email address, and a phone number where they can be reached with the best time to call. Additional information included names and phone numbers of three relatives or friends to contact if the participant could not be reached. Arrangements were made for participants to return their pedometers to study locations or have them picked up by the RA. Data were then retrieved and recorded, and participants received a less expensive pedometer as an incentive for participating in the study. After returning the pedometer, completing the Short IPAQ, and indicating who wore the pedometer over the 7-day period.

Perceived physical environment. The abbreviated version of the NEWS-A (**Appendix F**) (Saelens et al., 2003) was used to assess the perceived physical environment. The NEWS-A

is based on the perspectives of participants regarding their neighborhood characteristics, such as street connectivity, safety from traffic and crime, and neighborhood satisfaction (Cerin, Conway, Saelens, Frank & Sallis, 2009). A total of 54 questions assessed participants' perceptions of physical environment, in eight separate domains: (1) residential density (6 items), (2) diversity of land mix (23 items), (3) access to services (3 items), (4) street connectivity (2 items), (5) walking/cycling areas (6 items), (6) aesthetics/neighborhood surroundings (4 items), (7) traffic hazards (3 items); and (8) crime (3 items) in the community. An additional set of questions (4 items) pertaining to difficulty parking, dead-end and hilly streets, and major barriers that prevent walking was also included (Cerin et al., 2006).

Examples of questions in the NEWS-A included: "How common are apartments or condos in your neighborhood?," "How long does it take to walk from your home to supermarket?" and "How easy is it to walk from home to stores?" Thirty-one of the questions in the NEWS-A were rated, based on two types of polytomous response-scales, ranging from 1 to 5 (none, a few, some, most, and all), and 1 to 4 (strongly disagree, somewhat disagree, somewhat agree, and strongly agree), respectively. The remaining 23 questions assessed walking time to stores, and required participants to choose the appropriate number, such as 1 to 5 minutes, 6 to 10 minutes, etc.

Over a 15-day time period, the test-retest reliability of neighborhood characteristics subscales showed ranges from $r = .58$ (walking/cycling facilities) to $r = .80$ (crime safety) in a sample of White, Hispanic/Latino, Asian/Pacific Islander, and other multi-ethnic men and women (Saelens et al., 2003). Another study involving 2,920 female nurses reported Cronbach's alpha of $>.75$ for 5 of 6 factors of a modified version of NEWS-A (Starnes et al., 2014).

A total walkability score was calculated for each participant from the 12 subscales of the NEWS-A using simple-summed scoring of 1 to 4 or 1 to 5 depending on the subscale, to indicate the perceived walkability of the physical environment (Kerr et al., 2006). High scores represented high walkability (a neighborhood that facilitates PA in the form of walking). The Cronbach's alpha for the 54-item NEWS-A in the current study sample was .8, indicating good reliability. Correlations among the 12 subscales of the NEWS-A showed that reliability ranged from .6 (highest) to -.006 (lowest). Although no correlation was found between some subscales (e.g., safety for walking and hilliness), most of the relationships showed positive or negative correlations.

Perceived partner support. Perceived partner support is an element of social support, an important concept and major component of the interpersonal level. The original Social Support and Exercise Survey (SSES) measures support of PA received from family and friends in the last 3 months (Sallis, Grossman, Pinski, Patterson, & Nader, 1987). Two separate columns are provided for the family and friends categories, enabling respondents to answer each question by source of support. The adapted SSES (ASSES) (**Appendix G**) expands the original measure by adding a third column for support that participants receive from their partners for PA.

Thirteen items were used to ask participants whether family, friends, and partners exercised with them, offered to exercise with them, gave them helpful reminders to exercise, provided encouragement, changed their schedule to facilitate exercising, discussed exercising, complained when they exercised, criticized them for exercising, provided rewards to them for exercising, planned for them to exercise during recreational activities, planned activities around their time to exercise, asked for their opinion on how they (the participants) can get more exercise, and discussed how they enjoyed exercising. Responses were based on a scale

representing none, rarely, a few times, often, very often, and does not apply, respectively.

Support received from family and friends was scored separately for each of the three categories (sources of support) by summing the numbers obtained based on answers received for each question on the ASSES. Women with higher scores perceived themselves as receiving more support for PA than those with lower scores.

The SSES has been found to be highly reliable in a study with Latino populations (internal consistency reliabilities were 0.91 for family and 0.93 for friends) (Marquez & McAuley, 2006). Importantly, the internal consistency reliabilities of the SSES used in a study with Hispanic women ranged from .84 to .91 (Keller et al., 2011). It has since been used in studies as separate scales and specifically to measure reported PA in various populations (non-Hispanic White, Hispanic, Asian/Pacific Islander, African American and Native American participants) (Kim, McEwen, Kieffer, Herman, & Piette, 2008; Morris, McAuley, & Motl, 2008). In this study, the Cronbach's alpha for the adapted 13-item ASSES was 0.9, indicating high reliability.

Attitudinal familism. The Attitudinal Familism Scale (AFS) (**Appendix H**) (Steidel & Contreras, 2003) provides a measure of family obligation influences that were examined in relation to the PA levels of participants. Unlike previous familism scales, this measure provides a multidimensional scope that covers various aspects of the concept present in Latino populations. It consists of 18 items that target four main domains of familism: familial support, interconnectedness, familial reciprocity during times of need; and honor and sacrifice of self for the sake of the family. Examples of questions included whether behavior of children should be controlled by their parents, and if time spent with relatives should be cherished. A polytomous response scale was used with numbers ranging from 1 to 10 to represent answers varying from

“strongly disagree” to “strongly agree,” respectively. High scores represented high familism. Scores can range from a total of 18 to 180, based on the responses of participants (Austin et al., 2012). A reliability of 0.88 was reported for the attitudinal familism in a study of 100 MAW (Austin et al.). Cronbach’s alpha for the 18-item AFS was 0.8 in this sample, indicating adequate reliability.

Individual characteristics. The Demographic Data Collection Form (DDCF) (**Appendix I**) was used to assess important individual characteristics of the participants using an interview approach to administer the DDCF, intended to assist participants who may experience difficulties in reading or understanding the questions. The estimated readability of the items in the DDCF measured by readability statistics was 8.6 (Flesch-Kincaid Grade Level), indicating a reading comprehension close to the 9th grade reading level. Individual characteristics of participants examined in this study as predictors included age, BMI, chronic conditions, employment status, and acculturation.

Age. Self-reported age (number of years) was obtained by asking participants, “How old are you?”

BMI. BMI was calculated from the ratio of weight in pounds to height in squared inches (Kim et al., 2008). Actual weight of participants was measured in pounds, and participants were asked to remove any outer layers and shoes if possible; height was calculated in inches. In a study with high school students, high correlations (0.89) were found between self-reported weight and height and the calculated BMI from measures obtained using Seca scales (Brener, McManus, Galuska, Lowry, & Wechsler, 2003).

Chronic health conditions. Chronic health conditions that were assessed include heart

attack (blood clot in the heart), heart failure (fluid around the heart), blood clot in the legs, stroke (blood clot in the brain), asthma or chronic obstructive pulmonary disease (COPD) (breathing problems or shortness of breath), diabetes (high blood sugar), kidney disease or on dialysis, hypertension (high blood pressure), arthritis (joint pain), cancer, depression, anxiety, and seizures. Participants answered “yes” or “no” to indicate whether or not a health care professional had said they had any of these health conditions. A sum score of chronic health conditions was calculated by totaling the number of items answered yes.

Acculturation. Acculturation was assessed using the General Acculturation Index (GAI) (Balcázar, Castro, & Krull, 1995). The 5-item measure assesses primary language, country of origin, place where early childhood was spent, and current friends (i.e., Hispanics/Latinos, Mexican Americans, Puerto Ricans, etc.). The GAI is scored on a scale of 1 to 5, with lower numbers representing lower acculturation (Balcázar et al., 2001). Cronbach’s alpha coefficient was 0.83 in a sample of 269 participants. However, in the current study the Cronbach’s alpha was 0.70.

Employment status. Self-reported employment was based on whether or not participants were currently working. This helped to avoid classifying those who performed sporadic employment as being employed. Detailed questions including part-time and full-time status further clarified degree of consistency in employment. The importance of employment status has been identified by significant correlations found between unemployment, decreased PA, and increased BMI ($p \leq .05$), in a study with MAW (Ayala et al., 2004). Employment was scored as unemployed, employed part-time, and employed full-time.

Additional questions on the DDCF included marital status, ethnicity (ethnic background), health status, current medications, treatment, occupation, country of origin, years of education

(highest grade completed in school), annual household income (total amount of money family receives), and age of entry into the US, if applicable. These items provided data about the characteristics of the sample.

Pilot Testing of Selected Measures

The Short IPAQ and the Attitudinal Familism Scale have already been translated into Spanish and used in studies including MA populations. However, because previous administration of the NEWS-A and the ASSES among MAW was not found in the literature review, focus groups were conducted to pilot test these measures prior to data collection during the main study.

Two separate focus groups (Spanish and English) were conducted to ensure that there were no difficult or ambiguous questions in the measures. Each focus group was comprised of six MAW recruited by CAB members by referrals from community program leaders and from settings where the study was implemented. Their background characteristics were similar to the target population in the main study (i.e., women of Mexican descent, 18 to 64 years old, and of varying levels of educational and socioeconomic status that included professional and non-professional women). Following an explanation of the study and focus groups, informed consents were obtained, and participants sat in a circle to facilitate open discussion of the measures. The focus groups were led by one RA, while another RA took notes on paper and audio-recorded the meeting to avoid losing data.

The measures were adapted based upon careful review and discussion of wording by participants in the two focus groups. Members of the focus groups made recommendations about how to simplify the wording of selected items; i.e., by adding simpler words in brackets next to the difficult ones. The new words were subsequently translated into Spanish by a

certified translator. The translator was fluent in both languages and had a good understanding of both cultures. After this process was completed, members of the CAB reviewed the translated and English versions for equivalency to see if there were any inconsistencies or problems with the translation. They provided consultation on issues that might arise related to questionnaires, such as differences in meaning/wording of translated and English items (semantic equivalence).

Each focus group lasted for approximately 2 hours, and group members each received a \$20 Target gift card compensating for their time. Pretesting began with the NEWS-A followed by the ASSES. After self-administration of the questionnaires, participants in the focus groups were asked to discuss individual items and to review them for readability, meaning, and clarity. The RA leading the focus group read each question aloud and then asked the group what it meant to them. A brief general discussion followed on the variables or concepts of this study to be measured by the instruments. Focus group members were asked to identify unclear questions and difficult words and to state whether or not they understood the response choices. Recommendations for simpler word choices were recorded by the RAs. The PI was available during the focus groups to answer questions as needed. Level of understanding for each question was evaluated, and questionnaires were modified as needed based on pretest results. Next the PI and RAs presented results of the pilot testing of measures to members of the CAB. A problem-solving approach was employed to address items that were difficult for participants to read or understand. Strategies to improve clarity were identified.

Data Management Plan

Questionnaires and questions on the DDCF were formatted and organized in a packet for interviewing. A codebook, created prior to data collection to identify and define variables of the study, made it easier to enter and retrieve data from a computer file. Variable names and

variable labels were created for each item on the questionnaires. Data were keyed and saved into a computer file using the Statistical Package for Social Science (SPSS) Version 22 within approximately 48 hours following data collection. The PI first entered data into the computer file; then the PI and RA verified the data entered by rechecking them against the original hard copies to track any missing data or data entry errors and correcting them as needed. The dataset was cleaned by checking for outliers and to ensure that the data made sense.

Data Analysis Plan

The PA dependent variable was measured using MET scores with a possible range from 0 to $\geq 3,000$. SPSS was used to analyze the data and to compute frequencies and descriptive statistics (e.g. median, mode, mean, range, and standard deviation) for the measures. The data were checked for assumptions for correlations and regression analyses by examining normality (based on skewness and kurtosis) necessary for the hypothesis testing. Since assumptions were not met, a log transformation was performed resulting in improved normality (skewness = $-.2$, kurtosis = $-.65$).

Internal consistency reliabilities for measures used in the study were estimated using Cronbach's alpha to examine how closely related items were on the multi-item measures. A Cronbach's alpha of at least 0.70 was considered acceptable for this study (Lee et al., 2011). Next, Pearson product-moment correlations were computed to examine bivariate associations between independent and dependent variables. Ordinary least squares regression models were used to estimate the unique association of each independent variable with the PA dependent variable. Following are the five proposed hypotheses that were evaluated.

Hypothesis 1. MAW living in areas where the physical environment supports PA will have higher levels of PA. For hypothesis 1, the independent variable, perceived physical

environment, is measured on a possible range of 50 to 298. A Pearson product-moment correlation was computed to estimate the relationship between the perceived physical environment and PA.

Hypotheses 2. MAW with higher levels of partner support will have higher levels of PA. For hypothesis 2, perceived partner support was measured on a possible range of 12 to 60. A Pearson product-moment correlation was computed to estimate the relationship between partner support and PA.

Hypothesis 3. MAW with higher levels of attitudinal familism will have lower levels of PA. For hypothesis 3, attitudinal familism is measured on a possible range of 18 to 180. A Pearson product-moment correlation was computed to estimate the relationship between attitudinal familism and PA.

Hypothesis 4. MAW of older age, higher BMI, greater number of chronic health conditions, lower acculturation levels, and who were unemployed will have lower levels of PA. A multivariate analysis using ordinary least squares was used to evaluate this hypothesis.

Hypothesis 5. MAW who live in physical environments that are more supportive of PA; have higher partner support; lower attitudinal familism; younger age, lower BMI, fewer chronic conditions, are employed, and are more acculturated will have higher levels of PA. This is a multivariate evaluation of the independent variables represented in hypotheses 1-4. Ordinary least squares regression was used to evaluate this hypothesis.

A total of 8 predictors were used in the analysis. Neighborhood characteristics, partner support, and attitudinal familism were treated as nominal or categorical (i.e., high vs. low). Age (range 18 to 64 years), BMI (kilograms per squared meters), number of chronic health conditions, and acculturation (possible range of 5-25) were treated as interval level data.

Employment was measured as an ordinal variable (0 = unemployed, 1 = part-time employment and 2 = full-time employment) and coded as two dummy variables for the analyses.

Human Subject Considerations

Acknowledgement and adherence to the rights of participants was ascertained by obtaining signatures on an informed consent (**Appendix J**) (developed according to guidelines established by the UCLA OHRPP) (IRB Approval # 14-000477) to ensure privacy and confidentiality during the study.

Informed consent. The informed consent was written in simple language to facilitate understanding among participants who may have had lower levels of education. It provided a description of the study and stated potential risks and possible discomforts that might be experienced during the interview process. The informed consent explained that participation in the study would be on a completely voluntary basis, and that participants had the right to refrain from answering any question, or to withdraw from the study altogether at any time, without fear of any consequences (UCLA OHRPP, 2011). The informed consent was read to the participants to ensure that those with low literacy levels understood it. They then received a copy of the signed informed consent, and a copy was retained for records of the study.

Privacy and confidentiality. Upon enrollment and prior to conducting the interview, each participant was assigned an identification number, only known to the PI and research dissertation chair, Dr. Koniak-Griffin at UCLA, School of Nursing. Anonymity of participants was maintained by ensuring that no identification marks were on questionnaires or the DDCF that could potentially link data to participants of the study. Instead, separate records were kept with the phone numbers of participants so that they could be contacted for the drawing of two randomly selected winners at the end of the study and for pedometer wearers to return the

pedometers. All data were recorded on paper, and then entered electronically into a computer file, prior to storage in locked file cabinets and a password-protected computer, respectively.

Interviews were conducted in a private area away from other participants or people attending the community program at the study location. Confidentiality was discussed and maintained regarding disclosure of information about the study to family or friends. Based on the preference of each participant, an individual plan was established at the beginning of the interview to determine whether or not the interview process would stop should a family or friend arrive at the location. This consideration is essential since it might become difficult for participants to answer questions pertaining to support for PA received from their family and/or partner.

Limitations of the Study

The cross-sectional nature of this research study does not allow causal inferences. However, data generated from this study enhance knowledge about potential influences on PA of MAW. The findings also provide a foundation for future longitudinal studies and the development of PA intervention programs. Other limitations included the small sample size and dependence on self-report measures. Self-reported information can also be subject to biases related to difficulties in recall and social desirability (Ham et al., 2007; Hays, Hayashi, & Stewart, 1989). However, the RAs were trained in the data collection process to help minimize these problems (Mann, Hoke, & Williams, 2005). Since this study was conducted in only one city, results cannot be generalizable to MAW living in other areas within the US. Similarly, findings from this study may not be generalizable to women who are not married or living with a partner. Nonetheless, findings can be compared with those of similar studies done in other areas

such as border settings. Finally, self-efficacy, defined as one's perceived ability to engage in a behavior (Bandura, 1977) was not examined as an individual level variable in this study

Summary

A cross-sectional survey design was employed for this study to examine influences on PA of MAW. Several measures were used to collect data on independent variables (i.e., the physical environment, partner support, attitudinal familism, and individual characteristics) and the dependent variable (PA). Data analysis provided estimates of the unique contribution of partner support and attitudinal familism within the context of the larger environmental, social, and individual factors on levels of PA among MAW. Measures of the study were used to quantify influential factors so that correlations and relationships among these variables could be identified. Findings are expected to enhance knowledge about PA in MAW and provide a basis for the development of culturally tailored PA intervention programs aimed to decrease risk for CVD and other chronic illnesses.

Chapter 5

Results

The intent of this dissertation is to investigate relationships between each of several factors that may influence levels of physical activity (PA) and self-reported PA among Mexican American women (MAW). Independent variables for this study were neighborhood characteristics, partner support, attitudinal familism, individual characteristics (i.e., age, employment status, acculturation, body mass index [BMI], and chronic health conditions). The dependent variable was self-reported PA. This chapter presents a brief description of the Community Advisory Board (CAB) followed by findings on sample characteristics, scores for the independent variables and the dependent variable, testing of hypotheses in relation to specific aims (e.g., relationships between independent variables and PA levels), and correlations between objectively measured and self-reported PA.

The CAB provided oversight in all aspects of the study, including guidance on recruitment strategies, review of measures to be adapted, and identification of sites for study implementation. Members of the CAB were six women within the age range of 18 to 64 years who self-identified as Mexican descent and were employed in the target community. Meetings with CAB members were conducted four times in local community-based organizations.

Sample Characteristics

One hundred and forty-three women were screened for eligibility. Of these, 31 were not eligible for participation due to ethnicity, age, partnership status, or current or recent pregnancy. All eligible women were enrolled in the study. Sample characteristics of the 112 eligible and enrolled women are presented in Table 5.1. Women ranged in age from 19 to 64 years (mean = 39, $SD = 11$). Sixty-six women (59%) identified themselves as Mexican, and a smaller

percentage reported that they were Mexican American ($n = 17$, 15%) or Hispanic ($n = 12$, 11%). Mexico was reported as the most common birthplace ($n = 98$, 88%), and 14 women (13%) stated that they were born in the U.S. For those not born in the U.S., age of entry varied widely from ≤ 6 to ≥ 19 years of age ($n = 6$, 5% and $n = 53$, 47%, respectively). Eighty women (71%) stated that they were currently married and living with their partner. Most women ($n = 100$, 89%) lived together with their children, and almost half of these had children who were 5 years of age or younger ($n = 49$, 49%).

The majority of women ($n = 71$, 63%) were unemployed. Among those who were employed, the most common types of work included field work (agricultural), housekeeping, and/or caregiving. Educational level ranged widely from no formal schooling ($n = 10$, 9%) to some college, trade school, or graduate school ($n = 23$; 21%). However, a large number of women reported having lower education at 8th grade or less ($n = 46$, 41%). Most women ($n = 54$, 48%) described their yearly household income as \leq \$20,000, indicating low income levels. Acculturation level was low (mean = 1.83, $SD = .78$), reflecting predominance of Spanish speakers and readers with little or no English rather than bilingual participants.

Table 5.1

Sociodemographic Characteristics of Sample (N = 112)

Individual Characteristics	Mean (SD)	Range
Age (years)	39.35 (11.10)	19 – 64
Acculturation ^a	1.83 (.78)	1 - 3.80
	Frequency (n)	Percent
<u>Self-identified ethnicity</u>		
Mexican	66	58.9
Mexican American	17	15.2
Hispanic	12	10.7
Combined ^b	17	15.2
<u>Place of birth</u>		
Mexico	98	87.5
US	14	12.5
<u>Age of entry into US (years)^c</u>		
< 6	6	5.4
6 – 18	35	31.3
≥ 19	53	47.3
<u>Marital Status</u>		
Never married and living with a partner	22	19.6
Living with a partner:		
married	80	71.4
separated, divorced, widowed	10	9.0

<u>Employment</u>		
Unemployed	71	63.4
Employed	41	36.6
<u>Education^d</u>		
No formal schooling	10	8.9
≤ 8 th grade	36	32.1
Some high school	27	24.1
High school graduation /GED	13	11.6
Some college, trade school or graduate school	23	20.6
<u>Income^e</u>		
<\$10,000	25	22.3
\$10,000 - \$20,000	29	25.9
\$20,001 - \$40,000	32	28.6
>\$40,000	9	8.1
Women with children living in household	100	89.3
Women with children ≤ 5 yrs old	49	49

^a Acculturation: based on 111 responses; possible range = 1 (low) to 5 (high).

^b Combined ethnicities = Mexican/Latino; Hispanic/Spanish, etc.

^c Age of entry in US: based on 94 responses.

^d Education: based on 109 responses.

^e Income: based on 95 responses.

Table 5.2 presents health-related characteristics of the sample. The majority of women were obese based on BMI ≥ 30 ($n=58$, 52%) calculated from weight and height (American Heart Association [AHA], 2015b). More than half ($n = 66$, 59%) of the participants reported that they had been told by a doctor or health care professional that they had a chronic health condition.

Specifically, 46 women (41%) reported having no chronic health conditions, while 45 women (40%) reported one or two conditions, and 21 (19%) said they had three or more chronic health conditions. The three most commonly reported chronic conditions were hypertension ($n = 25$, 22%), depression ($n = 23$, 21%), and diabetes ($n = 19$, 17%). The majority of women ($n = 85$, 76%) stated that having chronic health condition(s) did not prevent them from being physically active.

Table 5.2***Health-Related Characteristics of Sample (N = 112)***

Individual Characteristics	Mean (SD)	Range	Frequency	Percent
<u>BMI (kg/m²)^a</u>	31.97 (7.12)	18.7 - 54.5		
Normal (18.5 – 24.9)			17	15.2
Overweight (25 - 29.9)			36	32.1
Obese (≥ 30)			58	51.8
<u>Reported chronic health conditions</u>				
Yes			66	58.9
No			46	41.1
<u>Number of chronic health conditions</u>				
0			46	41.1
1			31	27.7
2			14	12.5
3 – 8			21	18.7
<u>Most common chronic health conditions^b</u>				
Hypertension			25	22.3
Depression			23	20.5
Diabetes			19	17.0
<u>Chronic health condition(s) preventing PA^c</u>				
No			85	75.9
Yes			26	23.2
<u>Health Insurance</u>				

No	66	58.9
Yes	46	41.1

Note: Body Mass Index (BMI), physical activity (PA).

^aBMI: based on 111 responses.

^b Most common chronic health conditions; women may have reported having ≥ 1 condition (e.g., only hypertension; hypertension and depression, etc.).

^cChronic health conditions preventing PA, based on 111 responses.

Scores for the Independent Variables

Scores were calculated for each of the following independent variables: the physical environment, partner support, attitudinal familism, and individual characteristics (age, BMI, number of chronic health conditions, acculturation, and employment status).

The physical environment. The abbreviated Neighborhood Environment Walkability Scale (NEWS-A) was used to measure neighborhood characteristics of the physical environment and scored following guidelines for the NEWS-A (Cerin, Saelens, Sallis & Frank, 2006). Scores were calculated for each of the 12 subscales using the NEWS-A scoring protocol (Cerin et al., 2006). Cronbach's alpha for the NEWS-A was 0.8. Particularly high scores were noted for residential density (one subscale of the NEWS-A) indicating that women lived in higher density, more walkable neighborhoods (i.e., with a higher combination of single-family homes, townhouses, and apartment residences). However, outlier scores for residential density were further analyzed, and eight women were excluded from the analysis. This exclusion was based on scoring algorithms allowing possible range (77 to 473) for residential density so that scores < 77 or > 473 were considered outliers (E. Cerin, personal communication, December 4, 2014). Among the women with outlier scores, one was dropped for missing data and seven for discrepancies or inconsistencies across questions (e.g., women described their neighborhoods as

having all single-family homes while reporting that most residences were townhouses and apartments), resulting in a reduced sample size ($n = 102$).

Following the elimination of data for these eight women, the following steps were taken to further analyze the NEWS-A scores based on consultation for scoring guidelines (K. Cain, personal communication, October 14, 2014). First, scores for each subscale were standardized by transforming them into z scores, and then composite scores were calculated. Next, the z scores for all subscales were summed to form the composite scores referred to as the total walkability scores for women. Total walkability scores were categorized into low and high walkability groups using the mean split. The mean was chosen since the frequency distribution of total walkability scores was normal and had similar mean and median values (skewness = $-.2$; kurtosis = $.3$). Women with scores below the mean were categorized into the low walkability group, and those with scores above the mean were categorized as high walkability.

The high walkability group had higher scores for residential density, land-use mix – diversity (e.g., time it takes to walk to stores and other facilities in the neighborhood), land-use mix – access (number of stores and facilities within easy walking distance), street connectivity, safety for walking, and aesthetics than those in the low walkability group. Further, the high walkability group had fewer traffic hazards, lower crime rates, and fewer cul-de-sacs than those in the low walkability group. Conversely, lack of parking areas was higher in the low walkability group than the high walkability group (i.e., women who lived in areas with less parking walked less). The high walkability group had less hilliness and fewer physical barriers in their neighborhoods than the low walkability group.

Descriptive findings on the NEWS-A are presented in Table 5.3. Categorization of walkability scores showed that women in the low walkability group ($n = 46$) reported living in

low walkable neighborhoods, while women in the high walkability group ($n = 58$) lived in high walkable neighborhoods. Women in the high walkability group described their neighborhoods as having higher residential density ($F = 6.09, df = 94.83, p = .015$), more land-use mix - access ($F = 14.18, df = 67.45, p < .001$), greater street connectivity ($F = 5.60, df = 80.99, p = .020$) and increased safety for walking ($F = 19.18, df = 67.39, p < .001$) than those living in low walkability neighborhoods. Additionally, women in the high walkability group perceived that their neighborhoods had less hilliness ($F = 21.16, df = 71.93, p < .001$) and fewer physical barriers ($F = 17.55, df = 71.47, p < .001$) than those in the low walkability group. However, women in the low and high walkability groups did not differ significantly in land-use mix--diversity, aesthetics, traffic hazards, crime, lack of parking areas, and lack of cul-de-sacs.

Table 5.3

Descriptive Statistics for NEWS-A

NEWS-A Subscales (<i>n</i> = 104)	Low Walkability	High Walkability	<i>df</i>	<i>p</i> -value
	(<i>n</i> = 46) Mean (<i>SD</i>)	(<i>n</i> = 58) Mean (<i>SD</i>)		
A. Residential density ^a	198.15 (34.65)	219.84 (58.77)	94.83	.015
B. Land-use mix – diversity	2.79 (.87)	3.22 (.75)	102	.382
C. Land-use mix -- access	2.76 (.93)	3.59 (.52)	67.45	<.001
D. Street connectivity	2.61 (.95)	3.53 (.71)	80.99	.020
E. Safety for walking	2.62 (.86)	3.37 (.49)	67.39	<.001
F. Aesthetics ^b	2.53 (.92)	3.08 (.77)	102	.188
G. Traffic hazards	2.86 (.78)	2.45 (.74)	102	.860
H. Crime	2.65 (.97)	2.22 (.94)	102	.961
I. Lack of parking areas	2.56 (1.10)	2.36 (1.05)	102	.635
J. Lack of cul-de-sacs	2.30 (1.00)	2.22 (1.10)	102	.272
K. Less hilliness	2.69 (1.13)	3.67 (.71)	71.93	<.001
L. Fewer physical barriers ^c	2.86 (1.08)	3.70 (.67)	71.47	<.001

Note. Abbreviated Neighborhood Environment Walkability Scale (NEWS-A). Range of scores: Subscale A (173-431), high score = high walkability; Subscale B (1-4.78), high score = high walkability; Subscales C to F (1-4), high scores = high walkability; Subscales G to J (1-4), high scores = low walkability; Subscales K to L (1-4), high scores = high walkability.

^aResidential density = different types of residences (i.e. single-family houses, apartments, etc.)

^bAesthetics = attractive surroundings (i.e. trees and scenery)

^cPhysical barriers = freeways, railway lines, rivers, canyons, hillsides.

Table 5.4 presents descriptive statistics for the ASSES, the Attitudinal Familism Scale (AFS) and the General Acculturation Index (GAI).

Partner support. Scores for the ASSES were calculated based on each woman's perceived support for PA received from family, friends, and her partner. Each category was calculated separately by summing the scores of each item and then computing the mean for all of these items. Cronbach's alpha for the ASSES was 0.9. The ASSES scores for partners and family were similar (mean = 2.73, $SD = .94$, range 1.00 – 4.85; mean = 2.76, $SD = .83$, range 1.38 – 4.77, respectively). Hence, women viewed the support for PA received from their partner and family as nearly the same. However, support for PA from friends was perceived to be lower (mean = 2.29, $SD = .74$).

Attitudinal familism. A total score was calculated for each woman by summing the scores for each item on the AFS. AFS mean scores ranged from 4.83 to 10 (mean = 7.98, $SD = 1.15$). Cronbach's alpha for the AFS was 0.8. Higher AFS scores denote higher levels of attitudinal familism. Women with high levels of attitudinal familism placed a higher value on the importance of family than those with lower scores.

Acculturation. A total score was calculated by summing scores for each item on the GAI. Mean scores were computed by dividing the sum of all items by the number of items to form GAI scores. Cronbach's alpha for the GAI was 0.7. GAI scores showed a range from 1.00 to 3.80 (mean = 1.83, $SD = .78$), demonstrating very low acculturation levels. Women with low acculturation scores were characterized as predominantly Spanish-speaking, born in Mexico, had friends of their own or similar ethnicity, and demonstrated pride in their ethnicity.

Table 5.4

Descriptive Statistics for Independent Variables (N = 112)

Independent Variables	Minimum	Maximum	Mean	SD
<u>ASSES</u>				
Family	1.38	4.77	2.76	.83
Friends	1.00	4.31	2.29	.74
Partner	1.00	4.85	2.73	.94
<u>AFS</u>	4.83	10.00	7.98	1.15
<u>GAI^a</u>	1.00	3.80	1.83	.78

Note. Adapted Social Support and Exercise Scale (ASSES), Attitudinal Familism Scale (AFS), General Acculturation Index (GAI).

^aGAI: based on 111 responses; possible range 1 (low) to 5 (high).

Scores for the Dependent Variable

Both continuous and categorical PA scores were created.

Continuous PA scores. The Short International Physical Activity Questionnaire (Short IPAQ) was used to calculate continuous PA scores using Metabolic Equivalent per week (MET-minutes/week). Values for MET levels (shown in Figure 1) were determined for each woman based on guidelines for the Short IPAQ scoring protocol (i.e., MET level values of 3.3, 4, and 8 were given for walking, moderate intensity PA, and vigorous intensity PA, respectively) (International Physical Activity Questionnaire, 2010). Next, MET-minutes for walking, moderate intensity PA, and vigorous intensity PA were calculated separately for each category (i.e., MET level times minutes of PA per day times days per week). MET-minutes for all three categories were summed to form the total MET-minutes known as the PA score (International Physical Activity Questionnaire, 2010). After deleting one item, Cronbach's alpha for the short

IPAQ was 0.7 showing acceptable reliability (Nunnally, 1978). The item about sitting was deleted because it is the opposite of PA and unrelated to the other questions in the measure.

	MET Levels
Walking	3.3 METs
Moderate Intensity	4.0 METs
Vigorous Intensity	8.0 METs

Fig. 1 Values for MET Levels

Continuous PA scores could not be assigned for 10 women, resulting in a final sample size of 102 women. Three of the ten women had extensive missing data, and seven reported very little or no PA so that a total score could not be calculated (International Physical Activity Questionnaire, 2010). Those with no PA scores were eliminated, since it is unlikely that no activity was performed during the 7-day period. Results from a chi-square test comparing excluded and included women in the sample showed no significant differences in marital status ($p = .779$), employment status ($p = .357$), level of education ($p = .971$), yearly household income ($p = .622$), or reported chronic health conditions PA ($p = .293$).

T-test analyses comparing the excluded and included women in the sample revealed no statistically significant differences in age ($p = .081$), BMI ($p = .077$), number of chronic health conditions ($p = .642$), or acculturation ($p = .760$). Non-normality in the distribution of PA scores of women (based on skewness and kurtosis) necessitated log transformation of scores leading to improved normality in the distribution (skewness = $-.27$, kurtosis = $-.65$). The new log-transformed PA scores, used as the outcome variable, will be referred to as PA in the remainder of this chapter to avoid redundancy.

Categorical PA scores. Continuous PA scores of women were categorized into three groups to form categorical PA scores. The three categories were based on guidelines for the Short IPAQ scoring protocol (International Physical Activity Questionnaire, 2010).

- (1) Low PA = no self-reported PA or does not meet criteria for moderate or high PA).
- (2) Moderate PA = meeting any of the following three criteria:
 - (a) ≥ 20 minutes per day of vigorous PA for ≥ 3 days or
 - (b) ≥ 30 minutes per day of walking and/or moderate activity for ≥ 5 days or
 - (c) any combination of activities: walking, moderate or vigorous activity ≥ 5 days achieving ≥ 600 MET-minutes/week).
- (3) High PA meeting any of the following two criteria:
 - (a) vigorous activity ≥ 3 days and accumulating ≥ 1500 MET-minutes/week or
 - (b) any combination of walking, moderate or vigorous activities ≥ 7 days and accumulating ≥ 3000 MET-minutes/week) (International Physical Activity Questionnaire, 2010).

There was a wide variation of PA ranging from low ($n = 23$, 23%) to vigorous ($n = 47$, 46%). Descriptive statistics on PA levels are shown in Table 5.5. Values indicate that the majority of the women ($n = 79$; 78%) reported moderate to high levels of PA.

Table 5.5.

Levels of PA

Self-Reported PA ($N = 102$)	Frequency	Percent
Low PA	23	22.5
Moderate PA	32	31.4
High PA	47	46.1

Testing of Hypotheses in Relationship to Specific Aims

Hypothesis 1. A Pearson's product-moment correlation analysis was used to examine the relationship between the perceived physical environment (total walkability score) and PA of women. Results revealed a non-significant correlation between the physical environment and PA ($r = .01$, $p = .864$). Hypothesis 1 was rejected based on these findings. However, a further analysis involving individual subscales of the News-A and PA showed a positive and statistically significant correlation between residential density and PA ($p = .007$), indicating that women who reported living in more dense neighborhoods also reported higher PA. In contrast, a negative and statistically significant correlation was found between crime and PA ($p = .01$), indicating that those who reported living in high crime areas had less PA. Correlations between PA and the other subscales of the NEWS-A were not found to be significant.

Hypothesis 2. A positive and statistically significant correlation was found between support for PA received from partners and PA of women ($r = .29$, $p = .001$), supporting acceptance of hypothesis 2. Both family support and friends support also showed significant relationships with PA (see Table 5.6).

Table 5.6

Pearson Product-Moment Correlations Between Partner Support and Reported PA (N = 102)

Social Support for Exercise (ASSES)	Self-reported PA	
	<i>r</i>	<i>p</i> -value
1. Partner support	0.29	.003
2. Family support	0.28	.003
3. Friends support	0.33	.001

Hypothesis 3. The correlation between attitudinal familism and PA was not significant ($r = .03$, $p = .762$), leading to rejection of hypothesis 3.

Hypothesis 4. A multiple regression analysis was performed using independent variables of individual characteristics (age, BMI, number of chronic health conditions, acculturation, and employment status) and PA as the dependent variable. The following five predictors of PA shown in model 1 on Table 5.7 were found to be non-significant: age ($p = .243$), BMI ($p = .889$), number of chronic health conditions ($p = .172$), acculturation ($p = .061$), and employment status ($p = .499$). BMI, identified as the weakest predictor with the highest p -value, was removed to create a more parsimonious model with improved power. A second regression analysis was performed to test the hypothesis; results showed that acculturation was a significant predictor in the second model ($p = .049$), when controlling for the three remaining predictors. Importantly, p -values for variables remaining in the second model were comparable to the same variables in the first model and the r -square (.11) was the same for both models. This indicates that women

with higher acculturation demonstrated higher levels of PA. These findings provide partial support for hypothesis 4.

Table 5.7

Regression Models for Individual Characteristics and PA (N = 102)

Individual Characteristics	B	Std. Error	<i>t</i>	<i>p</i> -value
<u>Model 1</u>				
Age	-.01	.01	-1.17	.243
BMI	-.00	.01	.14	.889
Number of chronic health conditions	.13	.09	1.37	.172
Acculturation	.37	.19	1.89	.061
Employment status	-.20	.30	-.67	.499
<u>Model 2</u>				
Age	-.01	.01	-1.17	.244
Number of Chronic Health Conditions	.13	.09	1.41	.161
Acculturation	.37	.19	1.99	.049
Employment status	-.20	.30	-.68	.494

Note. *R*-square for models 1 and 2 = .11

Analysis of individual characteristics using Pearson's product-moment correlation not controlling for other characteristics showed a non-significant correlation between age and PA ($r = -.02, p = .80$). Additionally, a statistically significant correlation was found between employment status ($r = -.19, p = .04$) and PA (i.e., unemployed women scored higher on PA than employed women).

Hypothesis 5. MAW who live in physical environments that are more supportive of PA and who have higher partner support, lower attitudinal familism, younger age, lower BMI, fewer chronic health conditions, are employed, and are more acculturated will have higher levels of PA.

A multiple regression analysis was used to evaluate relative influences of the physical environment, partner support, and individual characteristics as predictor variables on PA levels. Table 5.8 shows that when all predictor variables (physical environment, partner support, attitudinal familism, age, BMI, chronic health conditions, employment status, and acculturation) were entered into the model, statistical significance was found only for partner support ($F = 2.31$, $B = .39$, $p = .01$). Therefore, women who perceived themselves as having high levels of partner support had higher levels of self-reported PA. Further analysis was performed involving exclusion of the least significant variables in models 2 and 3. In the second model, significance was found for partner support ($p = .006$) when BMI ($p = .99$) was excluded. However, when physical environment ($p = .86$) was excluded in the third model, significance was found for both partner support ($p = .02$) and acculturation ($p = .008$). R -square remained consistent at .4 for all three models. These results indicate overall rejection of hypothesis 5, although partial acceptance occurred for partner support and acculturation.

Table 5.8

Independent Variables, Individual Characteristics and PA (N = 102)

Independent Variables	B	Std. Error	<i>t</i>	<i>p</i> -value
<u>Model 1</u>				
Physical environment	.01	.03	.16	.869
Partner support	.39	.14	2.80	.006
Attitudinal familism	.11	.12	.95	.343
Age	-.01	.01	-.75	.453
BMI	-3.85	.01	-.00	.998
Number of chronic health conditions	.14	.09	1.44	.152
Employment status	-.21	.31	-.68	.497
Acculturation	.30	.21	1.40	.163
<u>Model 2</u>				
Physical environment	.01	.03	.167	.868
Partner support	.39	.13	2.84	.006
Attitudinal familism	.11	.12	.965	.447
Age	-.01	.01	-.088	.446
Number of Chronic Health Conditions	.14	.09	.178	.131
Employment	-.21	.31	-.078	.687
Acculturation	.30	.21	.177	.154

<u>Model 3</u>				
Physical environment	.36	.13	2.72	.008
Attitudinal familism	.14	.11	1.26	.211
Age	-.01	.01	-.698	.487
Number of Chronic Health Conditions	.11	.09	.139	.211
Employment	-.18	.29	-.636	.526
Acculturation	.44	.19	2.31	.023

Correlations between Objectively Measured and Self-reported PA

PA was objectively measured in a sample of 16 women using Yamax Digiwalker CW-701 pedometer readings showing daily number of steps taken over a 7-day period. Women recorded the time of day the pedometer was placed and removed from their belt or waist of clothing to provide verification of personal use. The average number of daily steps recorded from the pedometer worn by each woman was used to examine correlations between objectively measured and self-reported PA. PA guidelines indicate that pedometer readings showing $\geq 10,000$ steps are needed to reach goal levels of PA (AHA, 2015h). In calculation of pedometer readings, three women were excluded from the analysis because they had less than 2 days of pedometer readings ($n=2$) or data that was unbelievable (consistent with immobility). Research findings support the inclusion of pedometer recordings with data for two or more days to achieve adequate reliability ($r = \geq .8$) (Rowe, Kemble, Robinson & Mahar, 2007). The final sample of the pedometer analyses was 13 and all except two women had between three to seven days of pedometer readings. The average daily steps for women was 7,354 ($SD = 3333$, range = 3150 to

10,986). Based on AHA guidelines, calculations showed that the majority of women in the sample of 13 ($n = 8, 61.5\%$) who wore pedometers did not meet the number of daily recommended steps for adequate PA, and only five were considered to be sufficiently physically active.

A Short IPAQ score was calculated for each woman based on the period that the pedometer was worn. Descriptive statistics for the IPAQ scores shown in Table 5.9 indicate that most women reported moderate to high levels of PA ($n = 10, 78\%$).

Table 5.9

Descriptive Statistics for Short IPAQ in Pedometer Wearers (n = 13)

Short IPAQ	Frequency	Percent
Low PA	3	22
Moderate PA	5	39
High PA	5	39

A frequency distribution of the IPAQ scores for pedometer wearers showed non-normality (based on skewness and kurtosis) that required a log transformation. A Pearson's product-moment correlation showed a positive non-significant correlation between pedometer readings and log-transformed IPAQ scores for pedometer wearers ($r = .46, p = .106$). This analysis indicates that women with higher pedometer steps also reported higher levels of IPAQ scores, although the association was not significant.

Summary

The findings of this study indicate that perceived PA ranged widely from low to high, with the majority of women reporting moderate to high levels of PA based on scoring guidelines

for the Short IPAQ (International Physical Activity Questionnaire, 2010). Results of the bivariate correlations and multiple regression analyses showed two significant predictors of PA: partner support and acculturation. The hypothesized relationships between the other independent variables (i.e., physical environment and attitudinal familism) and PA were not supported by the data. Relationships investigated between individual characteristics (age, employment status, acculturation, BMI, number of chronic health conditions) and PA showed that only acculturation was a significant predictor. The correlation between objective measures of PA from pedometer readings and self-reported IPAQ scores were not significant, although the relationship was in the expected direction (i.e., women with higher pedometer scores reported higher levels of PA). These findings suggest that future studies examining influences on PA and those testing PA intervention programs for MAW should address partner support and acculturation factors.

Chapter 6

Discussion

This community-based study examined predictors of physical activity (PA) in a sample ($N = 112$) of middle-aged, predominantly Mexican American women (MAW) living in Southern California. Levels and predictor variables of PA were evaluated based upon self-reported measures, with women completing questionnaires that were administered in an interview format. The major findings from correlational and regression analyses supported the significant influence of partner support and acculturation on PA, thereby expanding knowledge about PA among MAW. Several of the hypothesized relationships and regression models were not fully supported. A surprisingly high percentage of women (77.5%) reported moderate to high levels of PA. This finding was unexpected given their body mass index (BMI) categorization into the overweight and obese range. These findings are discussed in the following main sections of this chapter: major significant findings, non-significant findings, study limitations, and implications for clinical practice and recommendations for future research.

Major Significant Findings

Physical activity. Overall self-reported PA was measured using the short International Physical Activity Questionnaire (IPAQ) to calculate time spent in various domains (i.e., leisure or spare time activity, sports, walking for transportation, household and occupational duties) without differentiating time spent in each (Craig et al., 2003). Although this measure does not generate subscale scores for each domain, it is used to calculate a total score that can be categorized into three levels. Results of this categorization showed that the majority of MAW engaged in moderate (31.4%) to high (46.1%) levels of PA.

As an objective measurement for PA, 16 women wore pedometers for 7 days to evaluate findings in comparison to self-reported PA during a concurrent time period. After dropping data

for three women because of extraordinarily low readings and missing data, a positive non-significant correlation ($r = .46$) was found between pedometer steps and IPAQ scores. Given the small sample ($n = 13$) of pedometer wearers, it is possible that the non-significant correlation may be related to a lack of power, and a larger sample would have shown significance.

Similarly, a lack of significance was found for the correlation between the short IPAQ and the digiwalker pedometer readings ($p = .5$) in a study involving Hispanic adults ($n = 58$) infected with HIV (Ramirez-Marrero et al., 2008). Based on their findings the investigators also suggested that $\geq 10,000$ steps per day may be an unrealistic classification for high PA. Further consideration regarding the recommended number of steps per day for overweight/obese MAW may be beneficial (Koniak-Griffin et al., 2013).

While the pedometer provides measurement of steps, the accelerometer captures bodily movement and energy expenditure, providing more accurate objective measurements of PA (Corder, Brage & Ekeland, 2007); hence, accelerometers might have shown different results. Importantly, validation of the short and long IPAQ based on accelerometer readings (Craig et al., 2003), indicates that a stronger correlation may be expected with this measure than that found in the present study.

The moderate to high levels of PA based on IPAQ calculations in the dissertation study are congruent with objective findings from accelerometer measures of PA reported in a previous study involving predominantly overweight or obese MAW in Southern California (Koniak-Griffin et al., 2013). Both the accelerometer readings and the short IPAQ used in the current study provide comprehensive measures for PA without differentiation of specific domains. However, despite the lack of differentiation in the types of PA in these studies, the moderate to high levels of actual and self-reported PA indicate that the women are fairly active.

Nonetheless, recent research raises a number of questions concerning the optimum approach to measuring PA. Both the long IPAQ (Bermúdez et al., 2013) and the short IPAQ (Lee, Macfarlane, Lam & Stewart, 2011; Oyeyemi, Umar, Oguche, Aliyu & Oyeyemi, 2014) have been found to overestimate measurement of moderate and vigorous PA. These findings support use of multiple measures, including devices such as the accelerometer or pedometer and self-reports to improve accuracy and comprehension about PA in future research. Another important consideration is that levels of PA may differ across studies based on how it is operationalized (e.g., overall PA versus PA in a few domains) (Coleman et al., 2012). The moderate PA reported in this study conducted with MAW living in Southern California based on data obtained from the Physical Activity Assessment survey is contrary to the moderate to high levels of PA reported in the current study. Like the short IPAQ, the Physical Activity Assessment survey also provides a comprehensive measurement of overall PA (i.e., walking and running) performed during exercise, fun, transportation, and sports. However, the Physical Activity Assessment survey does not assess PA performed during household and occupational duties. Exclusion of domains, as well as the PA classification system used, may affect scoring and should be considered when comparing results across studies using this survey and the IPAQ. Hence, measurement of PA in several domains may lead to higher scores when compared to a single domain, such as leisure time physical activity (LTPA).

The self-reported PA findings of this study are similar to those of a larger investigation involving women and men ($N= 38,746$) in Mexico who completed the short IPAQ (Ortiz-Hernández & Ramos-Ibáñez, 2010). Notably, the majority of the participants were women (58%) who reported moderate (21.2%) to high (60.6%) levels of PA. Although this study was conducted in urban and rural areas of Mexico, findings are consistent with results of the

dissertation study. Studies that used the long IPAQ with MAW are important to consider, since both versions include some common items and have been validated using accelerometer data in an international study involving 12 countries (Craig et al., 2003). Several investigators have examined PA among predominantly MAW using the long IPAQ (Ayala et al., 2011; Martinez et al., 2011; Skowron et al., 2008). Administration of the long IPAQ has enabled analysis of different domains of activity pertaining to leisure time (Skowron, et al., 2008), leisure time and occupation (Ayala et al., 2011), and transportation (Martinez, et al., 2011). Findings have demonstrated that women reported low amounts of LTPA (Skowron et al., 2008), and levels of LTPA were similar among those who had sedentary and manual type occupations (Ayala et al., 2011). Less than one third of MAW reportedly met PA guidelines by walking for transportation (Martinez et al., 2011). Although findings of these studies provide valuable information about specific domains of PA, these data do not enhance understanding about overall PA or activity performed in other domains by MAW.

Social Support. The Social Support for Exercise Survey (SSES) (Sallis et al., 1987) was adapted for this study by expanding the two original sources of support (family and friends) to include partners as a third category. In the original SSES, measurement of the “family” component of support includes any type of family member as a source of support without distinguishing support received from partners. In the study sample, similar scores were obtained for support received from family (mean = 2.76, *SD* = .83) and partners (mean = 2.73, *SD* = .94), although support from friends (mean 2.29, *SD* = .74) was slightly lower. These levels of support were moderate based on a scale of 1 (low) to 5 (high). Nonetheless, significant correlations were found between PA and social support received from family ($r = .28$; $p = .003$), friends ($r = .33$,

$p = .001$), and partners ($r = .29, p = .003$). These correlations support the positive influence that greater social support may have on PA levels among MAW.

The original SSES has been used in previous research to separately examine influences of social support received from family and friends. In evaluating a PA intervention among a homogenous sample (100%) of MAW (ages 45-70 years), Keller and Gonzalez (2008) found a strong correlation between time spent walking and social support received from family and friends. Although support from friends was identified as a primary factor in initiating walking among the women, this strategy was not shown to be effective over time in maintaining participation in walking. Findings of this study suggest that further investigation on the influence of the family (particularly partner support as a component of family support) may help to explain why it plays such an important role in PA levels.

Important differences found in other studies examining influences of social support for LTPA received from family and friends (Marquez & McAuley, 2006a; Mier et al., 2007) may be related to the type of PA being measured. Marquez & McAuley (2006a), in examining PA performed during exercise, play, sports, and dance activities, found that women reported receiving greater support from their friends than family. However, family support was identified as a critical motivator for PA when various types of activities (exercise, home, and occupation) were considered, based on focus group data (Mier et al., 2007). Findings from systematic reviews of the literature also provide strong support for the important influences of both family and friends on levels of PA among Hispanic/Latino women (Kohlbray & Nies, 2010; Larsen et al., 2013).

Mixed results about the influence of social support on PA were found in studies consisting of less homogeneous samples of MAW. Baseline data from a PA intervention study

involving a subgroup of MAW (40%) revealed that women received high levels of support from their friends and family (Keller et al., 2011). In contrast, findings from a study including a small group of Hispanic women (5%) showed that those with gestational diabetes reported receiving only moderate levels of support for PA from family and friends (Kim et al., 2008). Further, an association was found between PA and social support received from family and friends. Hence, findings across systematic reviews and individual studies involving Hispanic/Latino and MAW have consistently shown that family support plays an influential role in the engagement of PA among these populations, so that further examination of partner support as a component of family support may be useful. Further, the moderate to high levels of support for PA received from family suggest that the important component of partner support may be beneficial in achieving a better understanding of how PA may be influenced among MAW.

Importantly, although results across studies have shown moderate to high levels of social support from family and friends, the influence of partner support has been evaluated only in qualitative studies. The inclusion of partner support as a component of family support allows specific measurement of the influence of partner support so that it can be specifically targeted. Numerous qualitative studies involving primarily MAW have revealed that partner support is an important influence on PA (Evenson et al., 2002; Juarbe et al., 2002; Martinez et al., 2009). Data from qualitative studies enhance understanding about barriers to family and partner support for engagement in PA among MAW that may have been experienced by some of the less active women in the dissertation study. Latina women reported in focus groups that their husbands did not value PA as important for them (Evenson et al., 2002). In another study, partners of MAW reportedly discouraged them from exercising (Martinez et al., 2009). Additionally, MAW have reported that lack of partner support was an influencing factor leading to lack of motivation to

engage in PA (Juarbe et al., 2002). Findings across qualitative studies are similar despite the different settings spanning from North Carolina (Evenson et al., 2002) to San Diego (Martinez et al., 2009) and Northern California (Juarbe et al., 2002). The samples in these studies were predominantly immigrants from Mexico.

Findings from the dissertation study are consistent with the results of qualitative studies, in that women who reported receiving more support from their partners engaged in more PA than those who received less support, as demonstrated by the positive and significant correlations. However, women in general received low levels of partner support for PA. This dissertation expands knowledge by providing quantitative data about the influence of social support from partners on PA of MAW that have not been previously reported.

Acculturation. The General Acculturation Index (GAI) evaluates language preference for speaking and writing, country where early childhood was spent, ethnicity of current friends, and pride in one's Hispanic /Latino background (Balcázar et al., 2001). Scores on GAI indicate that the acculturation level of women in the sample was relatively low. Low acculturation was not unexpected given that a large majority of women were born in Mexico (87.5%), and had immigrated to the US at age 6 or older (78.6%). A significant correlation was found between level of acculturation and PA, with more acculturated MAW engaging in higher levels of PA.

Similar positive associations have been reported in studies examining acculturation and overall PA among MAW with metabolic syndrome risk factors for cardiovascular disease (CVD) (Espinosa de los Monteros et al., 2008) and Latino women with diabetes (Barrera et al., 2012). In these studies the Acculturation Rating Scale for Mexican Americans-II (ARSMA-II) was used to assess acculturation. The ARSMA-II provides a detailed evaluation of language use, ethnicities of self, parents, and friends; and difficulty accepting one's own ideas, attitudes,

behaviors, values, practices, and customs and those of similar and other ethnicities (Cuéllar, Arnold, & Maldonado, 1995). Despite differences identified between the ARSMA-II and the GAI, similar results were found between these studies (Barrera et al., 2012; Espinosa de los Monteros et al., 2008) and the dissertation study.

The relationship between acculturation and LTPA in MAW also has been evaluated, with findings showing that a moderate level of acculturation has a positive influence on LTPA (Guinn & Vincent, 2008). No association was found between low acculturation or the amount of time living in the U.S. and engagement in LTPA (Martinez et al., 2012). Variation in findings across studies may be related to the nature of PA being evaluated, study locations, and how acculturation was assessed. Focus on LTPA that does not include activities in other PA domains (e.g., occupation and transportation) may have affected reported activity levels. Further, in studies conducted with homogeneous border communities where Spanish-speaking remains dominant, it is possible that evaluation of acculturation based on language preference alone could lead to lower acculturation scores (Martinez et al., 2012). In the study sample for this dissertation, most participants (74.1%) chose to complete their interviews in Spanish, suggesting that most women are oriented to their own culture.

Non-Significant Findings

Findings from this study do not support the hypothesized relationships between the physical environment, attitudinal familism, individual characteristics (age, employment status, BMI, number of chronic health conditions) and PA. The lack of correlation found between the physical environment and self-reported PA led to further analysis using individual subscales of the NEWS-A. Results showed that both residential density and crime were significantly correlated with self-reported PA, indicating importance of examining individual subscales to

gain insights on how MAW perceive specific neighborhood characteristics of the physical environment in relation to their PA.

In comparing differences in outcomes with previous research, a number of factors should be considered. Findings suggest that the NEWS-A was challenging for some MAW to understand, despite the steps taken in the preparation phase for this dissertation study. The English- and Spanish-speaking focus groups and bilingual members of the CAB endeavored to improve cultural appropriateness and linguistic equivalency of the translated instrument. However, following simplification of the NEWS-A, estimated readability of items of the NEWS-A indicates a reading comprehension at the 12th grade reading level (Flesch-Kincaid Grade Level = 12.5), resulting in difficulty in understanding questions, since the majority of the women had an 8th grade education or less. The original and longer NEWS administered with English-speaking MAW in another study (Keller et al., 2011) differed from the current study in that subscale scores were reported that were not equivalent to the low-high walkability classifications. Further instrument development with the NEWS-A with non-English-speaking Hispanic adults has been recommended based on findings of a cross-validation study with the NEWS (Cerin et al., 2009).

Similar concerns may exist regarding use of the Attitudinal Familism Scale (AFS), as a literature review identified only one PA study involving English-speaking MAW who completed this measure (Austin et al., 2012). Contrary to the dissertation findings, this study revealed that attitudinal familism had a significant, negative association with PA as measured by pedometer steps among the educated sample of women (40% college education or higher). Research studies conducted with Hispanic/MAW showing the impact of familism on health behaviors (e.g., PA) (Perez & Cruess, 2011) differed from results of the current study using attitudinal familism.

These differences may be related to variations in measurements used for familism (e.g., family viewed as referents who give advice, perceptions of family obligations and support) (Perez & Cruess, 2011) and attitudinal familism (placing family needs above self; close proximity between homes of family members; desire for family reciprocity as family members give and receive support from each other; and protection and honor of the family name (Steidel & Contreras, 2003). Despite these differences, appropriateness of using the AFS among Latino populations is acknowledged based on its validation against the commonly used ARSMA-II acculturation scales (Steidel & Contreras).

In examining age, results across studies that measure different types of PA (LTPA versus overall PA) can vary depending on operationalization of activity and whether objective or subjective instruments are administered. A negative association was found between age and overall self-reported PA among Hispanic/MAW identifying those who are younger to be more physically active (Eyler et al., 2002; Hawkins et al., 2009). Among Hispanic women, there was a higher prevalence of self-reported occupational and household PA (but not LTPA) with increased age (Eyler et al., 2002). In contrast, accelerometer classifications have shown that middle-aged MAW are more physically active than those younger or older (Hawkins et al., 2009).

In other studies focusing on LTPA, negative associations have been reported with age among Hispanic/MAW (Crespo et al., 2000; Marshall et al., 2007), and employment status has been identified as an influencing factor (Marshall et al., 2007). Mexican American (MA) adults have reported less LTPA than other non-Hispanic groups regardless of employment status (Crespo et al., 2000), and those with active jobs showed increased PA on weekdays compared to those in sedentary occupations based on accelerometer readings (Domelen et al., 2011).

The inconsistent relationships found between PA and BMI, identified as obesity and overweight (Bowie et al., 2007; Hubert et al., 2005; Koniak-Griffin et al., 2013; Riebe et al., 2009), may be related to differences in PA measures. In these studies involving Hispanic/MAW, significant associations have been found between lower self-reported PA and obesity (Hubert et al., 2005), as well as between no self-reported PA and overweight (Bowie et al., 2007). Meanwhile, although no association was found between overweight and self-reported PA, obesity was found to be associated with lower self-reported PA among older White adults (Riebe et al., 2009). Additionally, BMI was reported as inversely associated with the average daily steps measured using accelerometers with MAW; however, a large majority of the sample was moderately active (Koniak-Griffin et al., 2013). Differences between the dissertation findings and those of previous studies may be related to the measurement of overall PA (as opposed to LTPA), most commonly evaluated in the self-reported studies, and actual PA using accelerometers.

The lack of support for the predicted relationship found between number of chronic health conditions and PA in this study may be related to sample characteristics. Several studies reported in the literature that examined chronic health conditions and activity among Hispanic/MAW focused on LTPA (Dergance et al., 2005; Kruger, Ham & Sanker, 2008; Mouton et al., 2000). Older MAW with an average of three chronic health conditions also reported increased barriers to exercise (Mouton et al., 2000). Inactivity has been found to rise significantly as the number of chronic health conditions increases in Hispanic adults who are 50 years of age or older (Krueger et al., 2008).

Other studies similarly reported associations between chronic health conditions and LTPA among both MA and European American (EA) older adults, although MA adults were

shown to have an increased number of chronic health conditions (Dergance et al., 2005). In comparing findings of these earlier studies with the dissertation results, it is important to consider that the study sample was younger. This may have contributed to the lack of significant relationship found between the number of chronic health conditions and PA. With aging the prevalence of chronic health conditions increases, and a larger number of health conditions may influence the association with PA. Further, the chronic health conditions reported by participants in the study sample may not have reached the severity level to influence PA. Self-reported chronic health conditions of participants were not verified by medical records.

Study Limitations

Findings of this study and implications for practice should be considered in relation to its limitations. The cross-sectional design of the study only allows examination of factors related to PA but does not infer causation. Homogeneity in this sample of MAW (Mexican-born or Mexican heritage) and the setting (Southern California) limits generalizability of findings with other Hispanic/Latino subgroups and geographical locations. The scoring used for the IPAQ provided a measure of overall PA that is difficult to compare with domain-specific PA (e.g., occupation, household) or measures of LTPA. Issues related to comprehension of constructs within the NEWS-A measure were evidenced by data from a small group of women in the sample with low educational attainment. It is possible that administration of cognitive interviews rather than focus groups in the preparation of the study might have led to clarification by using more culturally appropriate terms to improve construct validity and further refinement of the NEWS-A, since this approach facilitates identification of specific problems respondents may encounter in using the measure (McColl, 2005). The readability, comprehension of items, and overall assessment of the measure can be tested using cognitive interviews (Caro-Bautista et al.,

2014) in conjunction with separate English and Spanish focus groups involving women in the target population. Finally, the use of self-reported measures may have been influenced by difficulties in recall or recall bias.

Implications for Clinical Practice and Recommendations for Future Research

The large majority of MAW in this study were overweight despite self-reports indicating engagement in varying amounts of PA, ranging from moderate-high to low levels (sedentary), suggesting that their actual involvement in PA may not be adequate for sustaining healthy weight. The importance of maintaining a healthy weight and engaging in regular moderate PA to prevent CVD and other illnesses is emphasized by the American Heart Association (AHA) (AHA, 2015b). Therefore it is important that clinicians and practitioners working with MAW provide comprehensive assessments of PA and address the need for healthy lifestyle behaviors that may prevent a variety of chronic diseases. Engagement in LTPA should be considered in the evaluation of overall PA, since this type of activity has been shown to be associated with decreased depression and stress in this population (Dergance et al., 2003).

It is important to assess walking, as it is a flexible activity that can be successfully incorporated to help improve cardiovascular health (AHA, 201d). Further examination of factors that may influence PA among MAW should include support received from family and partners, concerns about lack of time, and walking in their neighborhoods. Some common barriers to PA that should be targeted include family responsibilities (Parra-Medina & Messias, 2011), gender roles (Evenson et al, 2002), unsafe traffic, and crime (Larsen et al., 2013). Identifying how partner support may be used to enhance PA may be very beneficial in this population. It will help to identify how partner support is contributing to engagement in PA so that it can be used more effectively. Questions about household and child care duties (Parra-Medina & Messias,

2011), engagement in sports, presence of sidewalks and crime in the neighborhood (Larsen et al., 2013) can help provide better understanding of these barriers.

The lower level of acculturation of women in the sample indicates the importance of assessing acculturation factors that can possibly influence PA, including language use (DuBard & Gizlice, 2008), social interaction with ethnic friends, and ethnic pride (Dirk de Heer et al., 2011). Clinicians may identify barriers to PA by asking women questions about their preferred language, current circle of friends, and how proud they feel about their ethnicity (Dirk de Heer et al., 2011).

Following evaluation of PA and influencing factors, clinicians should encourage women to use basic lifestyle behavior strategies, including individualized counseling sessions targeting barriers and facilitators of PA through culturally tailored interventions (e.g., the Illinois WISEWOMAN program (Coleman et al., 2012). Referrals may be given to programs similar to *Salud Para Su Corazon* (Balcázar, Alvarado, & Ortiz, 2011) that can help promote better weight loss practices by targeting dietary habits. Family-based interventions such as the community-based BOUNCE (Behavioral Opportunities Uniting Nutrition, Counseling and Exercise) program may help improve diet and PA among mothers and their daughters through aerobic exercises, recreational sports, nutritional classes, and counseling sessions (Olvera et al., 2010). Such programs, aimed towards decreasing CVD risk through healthy diet and engagement in moderate PA (Khare, Cursio, Locklin, Bates & Loo, 2014).

While women with low PA should be targeted, attention should also be given to those who are already engaging in moderate PA so that they can continue to maintain this lifestyle. As a basis for intervention, video recordings showing different types (e.g., walking, household duties) and amount (time in minutes) of PA women are performing may be used to help increase

awareness and motivation in this population. Educational programs that are congruent with identified cultural preferences of women should utilize Spanish translation as needed and incorporate involvement of partners, family, and friends. Partners and family members can provide encouragement to facilitate engagement in PA (Eyler et al., 1999). Other strategies that may be beneficial may include support for PA from a “special friend” (Keller & Gonzales, 2008), “exercise buddy” (Hovell et al., 2008), or walking group (Keller & Gonzales, 2008).

Women should be encouraged to talk about PA with their friends, ask for their support, invite them to exercise-based social events (e.g., hiking), and if possible develop friendships with physically active women (Centers for Disease Control and Prevention [CDC], 2011b). A flexible program encouraging walking in segments of 10 to 15 minutes that gradually increases over time to 30 minutes per day (AHA, 2015d), may be a successful approach among MAW reporting lack of time as a barrier to being physically active. Pedometers also should be used as a motivational device to promote walking (Romero et al., 2008).

Recommended changes in public policy can help target obesity by enhancing PA through traffic safety and safer walking routes (Sallis, Floyd, Rodríguez & Saelens, 2012). Strategies may include the construction of sidewalks and crosswalks (CDC, 2011b). Other public policies may include transportation regulations (e.g., signs for pedestrian zones) and use of parks to help promote walking and increased PA (Sallis et al., 2006). Policies can be implemented to increase installation of street lights and surveillance cameras in public places and enforcement of criminal and traffic laws (Loukaitou-Sideris, 2006).

Future research should include the differentiation of levels and types of PA (i.e., leisure, occupation, household, and transportation) using self-reports and objective PA measurements to investigate support for PA that MAW receive from their partners while examining the level of

acculturation (i.e., language preference, ethnicities of friends, ethnic pride) of partners that may influence this support. Similarly, future studies should also examine levels and types of PA using self-reports and objective PA measurement, while considering the acculturation levels of family and friends that may influence PA among MAW. Correlations between the physical environment and PA can be further examined through model testing using subscales of the NEWS-A. Additionally, mediational analyses that extend beyond direct causal relationships may help identify specific mediator variables (Teixeira et al., 2015) that influence PA levels of the women.

Additionally, state-of-the-science instruments, including accelerometers and Geographical Information Systems (GIS), can provide greater accuracy in obtaining objective measurements of PA and information about neighborhood characteristics, respectively (Carlson et al., 2014). Similar to the NEWS-A, the GIS measures neighborhood characteristics (e.g., residential density) and can also be used to calculate walkability so that this can be used as a basis for PA intervention.

Conclusion


Findings of this dissertation accentuate partner support and acculturation as important predictors of overall PA in the sample of less acculturated, Spanish-speaking MAW with low educational attainment. A unique aspect of this study was the differentiation of the “partner” from the general “family” support category. Although some women reported higher levels of support in each of the three categories, findings are consistent with earlier qualitative research identifying a general lack of support for PA. However, since the support for PA received from partners, family, and friends was reported as fairly similar, future research should further

examine the relationship with acculturation levels of each of these influences while specifically targeting partner support.

The large number of overweight/obese women identified in the sample, despite moderate to high levels of self-reported PA, suggests that actual PA may not be sufficient for achieving or maintaining healthy weights. The link between overweight and obesity and increased risk for CVD, diabetes, and other chronic health conditions (AHA, 2015c) indicates that further attention is needed in this area. Greater adherence to the AHA recommended PA guidelines can help promote increased moderate to high PA for improved cardiovascular health (AHA, 2015f). Recommendations for future research include use of mediation analyses to identify possible mediator variables influencing PA and development of culturally specific PA intervention programs involving family, friends, and particularly partners to support and help promote healthy lifestyle behavioral changes (i.e., PA and diet), aimed towards the ultimate reduction in risk for CVD, diabetes, and other health conditions in this population.

Appendix A

**UCLA Research Study on Physical Activity
among
Women of Mexican Descent**



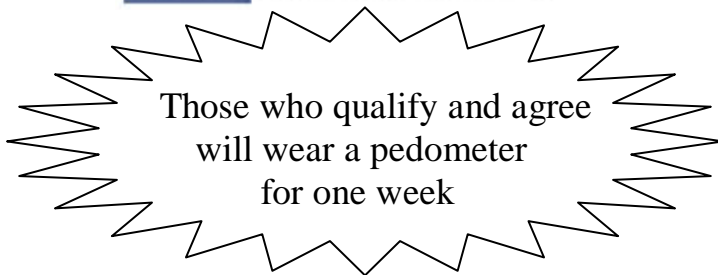
If you are

- A woman of Mexican-American descent
- Between the ages of 18 and 64
- Single and living with a partner
or
- Married and living with a partner
- Interested in becoming a participant in the study

Research Investigator:

Neomie Congello,
PhD Nursing Student

UCLA School of Nursing



Those who qualify and agree
will wear a pedometer
for one week

**PLEASE SIGN UP TO BECOME
A PARTICIPANT!**

**Interviews will last
approximately 1 hour**

*For Spanish: call Justina Fuentes
at (805) 844-3017*

or

*For English: call Neomie Congello
at (805) 910-8643*

***Height and weight will be measured during interviews
All participants will receive a \$10 Target gift card!***

Appendix B

SHORT INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the **last 7 days**. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the **vigorous** activities that you did in the **last 7 days**. **Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think **only** about those physical activities that you did for at **least 10 minutes** at a time.

1. During the **last 7 days**, on how many days did you do **vigorous** physical activities like heavy lifting, digging, aerobics, or fast bicycling?

___ **days per week**

no vigorous physical activities *Skip to question 3*

2. How much time did you usually spend doing **vigorous** physical activities on one of those days?

___ **hours per day**

___ **minutes per day**

don't know/not sure

Think about all the **moderate** activities that you did in the **last 7 days**. **Moderate** activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

3. During the **last 7 days**, on how many days did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

___ **days per week**

no moderate physical activities *Skip to question 5*

4. How much time did you usually spend doing **moderate** physical activities on one of those days?

____ **hours per day**

____ **minutes per day**

don't know/not sure

Think about the time you spent **walking** in the **last 7 days**. This includes at work and at home, walking to travel from place to place, and any other walking that you might do solely for recreation, sport, exercise, or leisure.

5. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time?

____ **days per week**

no walking *Skip to question 7*

6. How much time did you usually spend **walking** on one of those days?

____ **hours per day**

____ **minutes per day**

don't know/not sure

The last question is about the time you spent **sitting** on weekdays during the **last 7 days**. Include time spent at work, at home, while doing coursework and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

7. During the **last 7 days**, how much time did you spend **sitting** on a **week day**?

____ **hours per day**

____ **minutes per day**

don't know/not sure

Appendix C

Physical Activity Study – Pedometer Instructions

The Digiwalker CW-701 pedometer will be used to measure your physical activity throughout the day for seven days. The following steps will help you use the pedometer correctly.



Front

Back



Placement of Pedometer

Instructions

1. Use the clip on the back of the pedometer to attach to your belt or the waist of your clothing. Put the pedometer on as soon as you wake up in the morning and wear it all day. Remove it when you go to bed at night.
2. Do not get the pedometer wet. Remove it when taking a shower or bathing.
3. Store your pedometer in the same place every night so you can find it easily in the morning.
4. Make sure that the device is clipped firmly to your waist so the readings are accurate.
5. Wear the pedometer every day for seven days in a row including Saturday and Sunday.
6. Please do not let family members or children wear or play with the pedometer.
7. Make sure that you do not accidentally wash the pedometer while washing clothing.
8. You will receive a free pedometer when you complete the 7-day period and return the pedometer.

Appendix D

Physical Activity Log

1. Record the following on the physical activity log.
 - a. time you put on and take off the pedometer each day
 - b. type of physical activity you performed that day. For example, you can write: physical activity performed at home (e.g. mopping), work, while traveling (e.g. walking to take child to school or to grocery store), recreation (e.g. salsa dancing) sport, exercise (e.g. bike riding) and leisure time.
2. Record comments to help us understand the data. For example, you can write: you were active or not very active, slept all day, watch TV most of the day, went dancing with friends or forgot to wear the pedometer.
3. If you forget to wear the pedometer, attach it to your waist as soon as you can and record the time on the physical activity log.

Record of Pedometer Wearing	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Time put on							
Time taken off							
Type of Activity [e.g. home, work, traveling, recreation, sport, exercise, leisure]							

Appendix E
Pedometer Locator Guide

1. Please state your full name

_____ *First* _____ *middle* _____ *last*

2. Do you have other names or nicknames? Yes No

If yes, what are they? _____

3. Give me your current address and a phone number where you can be reached.

_____ *street address* _____ *apartment #*

_____, _____ *city* _____ *state* _____ *zip code*

home number (____) _____ - _____ cell number (____) _____ - _____

4. Do you have an email address? Yes No

If yes, can you tell me what it is? _____

5. When is the best time to call or visit you? _____

6. Is there another address where you may be located?

_____ *street address* _____ *apartment #*

_____, _____ *city* _____ *state* _____ *zip code*

7. If we cannot reach you by phone, is there a relative or friend who would know how to contact you?

_____ *name* _____ *relationship to you*

home number (____) _____ - _____ cell number (____) _____ - _____

8. If we still are unable to locate you, who else would know how to contact you?

_____ *name* _____ *relationship to you*

home number (____) _____ - _____ cell number (____) _____ - _____

9. Is there one last person who would know how to contact you if we still cannot reach you?

_____ *name* _____ *relationship to you*

home number (____) _____ - _____ cell number (____) _____ - _____

Appendix F

Neighborhood Environment Walkability Scale (NEWS)-Abbreviated

We would like to find out more information about the way that you perceive or think about your neighborhood. Please answer the following questions about your neighborhood and yourself.

A. Types of residences in your neighborhood

1. How common are **detached single-family residences (house that is not attached to another house or building)** in your immediate neighborhood (within a few blocks from your home)?

1	2	3	4	5
none	a few	Some	Most	All

2. How common are **town houses or row houses (homes that are attached above, below or next to each other) of 1-3 stories (levels or floors high)** in your immediate neighborhood (within a few blocks from your home)?

1	2	3	4	5
none	a few	Some	Most	All

3. How common are **apartments or condos (multiple homes or units in the same building) 1-3 stories (levels or floors high)** in your immediate neighborhood (within a few blocks from your home)?

1	2	3	4	5
None	a few	Some	Most	All

4. How common are **apartments or condos (multiple homes or units in the same building) 4-6 stories (levels or floors high)** in your immediate neighborhood (within a few blocks from your home)?

1	2	3	4	5
None	a few	Some	Most	All

5. How common are **apartments or condos (multiple homes or units in the same building) 7-12 stories (levels or floors high)** in your immediate neighborhood (within a few blocks from your home)?

1	2	3	4	5
none	a few	Some	Most	All

6. How common are **apartments or condos (multiple homes or units in the same building) more than 13 stories (levels or floors high)** in your immediate neighborhood (within a few blocks from your home)?

1	2	3	4	5
none	a few	Some	Most	All

B. Stores, facilities (buildings) and other things in your neighborhood

About how long would it take to get from your home to the **nearest** businesses or facilities (buildings) listed below if you walked to them?

*Please give only **one** answer for each business or facility (building).*

1-5 min 6-10 min 11-20 min 20-30 min 30+ min don't know

Example: gas station	<i>1-5 min</i>	<i>6-10 min</i>	<i>11-20 min</i>	<i>20-30 min</i>	<i>30+ min</i>	<i>don't know</i>
	1. _	2. _	3. <input checked="" type="checkbox"/>	4. _	5. _	8. _
1. Convenience/ small grocery	<i>1-5 min</i> 1. _	<i>6-10 min</i> 2. _	<i>11-20 min</i> 3. _	<i>20-30 min</i> 4. _	<i>30+ min</i> 5. _	<i>don't know</i> 8. _
2. Supermarket	<i>1-5 min</i> 1. _	<i>6-10 min</i> 2. _	<i>11-20 min</i> 3. _	<i>20-30 min</i> 4. _	<i>30+ min</i> 5. _	<i>don't know</i> 8. _
3. Hardware store with supplies for home repairs	<i>1-5 min</i> 1. _	<i>6-10 min</i> 2. _	<i>11-20 min</i> 3. _	<i>20-30 min</i> 4. _	<i>30+ min</i> 5. _	<i>don't know</i> 8. _
4. Fruit/ vegetable market	<i>1-5 min</i> 1. _	<i>6-10 min</i> 2. _	<i>11-20 min</i> 3. _	<i>20-30 min</i> 4. _	<i>30+ min</i> 5. _	<i>don't know</i> 8. _
5. Laundry/ dry cleaners	<i>1-5 min</i> 1. _	<i>6-10 min</i> 2. _	<i>11-20 min</i> 3. _	<i>20-30 min</i> 4. _	<i>30+ min</i> 5. _	<i>don't know</i> 8. _
6. Clothing Store	<i>1-5 min</i> 1. _	<i>6-10 min</i> 2. _	<i>11-20 min</i> 3. _	<i>20-30 min</i> 4. _	<i>30+ min</i> 5. _	<i>don't know</i> 8. _
7. Post office	<i>1-5 min</i> 1. _	<i>6-10 min</i> 2. _	<i>11-20 min</i> 3. _	<i>20-30 min</i> 4. _	<i>30+ min</i> 5. _	<i>don't know</i> 8. _
8. Library	<i>1-5 min</i> 1. _	<i>6-10 min</i> 2. _	<i>11-20 min</i> 3. _	<i>20-30 min</i> 4. _	<i>30+ min</i> 5. _	<i>don't know</i> 8. _
9. Elementary School	<i>1-5 min</i> 1. _	<i>6-10 min</i> 2. _	<i>11-20 min</i> 3. _	<i>20-30 min</i> 4. _	<i>30+ min</i> 5. _	<i>don't know</i> 8. _

10. Other Schools	<i>1-5 min</i>	<i>6-10 min</i>	<i>11-20 min</i>	<i>20-30 min</i>	<i>30+ min</i>	<i>don't know</i>
	1._	2._	3._	4._	5._	8._
11. Book store	<i>1-5 min</i>	<i>6-10 min</i>	<i>11-20 min</i>	<i>20-30 min</i>	<i>30+ min</i>	<i>don't know</i>
	1._	2._	3._	4._	5._	8._
12. Fast food Restaurant	<i>1-5 min</i>	<i>6-10 min</i>	<i>11-20 min</i>	<i>20-30 min</i>	<i>30+ min</i>	<i>don't know</i>
	1._	2._	3._	4._	5._	8._
13. Coffee Place	<i>1-5 min</i>	<i>6-10 min</i>	<i>11-20 min</i>	<i>20-30 min</i>	<i>30+ min</i>	<i>don't know</i>
	1._	2._	3._	4._	5._	8._
14. Bank/ Credit Union	<i>1-5 min</i>	<i>6-10 min</i>	<i>11-20 min</i>	<i>20-30 min</i>	<i>30+ min</i>	<i>don't know</i>
	1._	2._	3._	4._	5._	8._
15. Non-fast food	<i>1-5 min</i>	<i>6-10 min</i>	<i>11-20 min</i>	<i>20-30 min</i>	<i>30+ min</i>	<i>don't know</i>
	1._	2._	3._	4._	5._	8._
16. Video store	<i>1-5 min</i>	<i>6-10 min</i>	<i>11-20 min</i>	<i>20-30 min</i>	<i>30+ min</i>	<i>don't know</i>
	1._	2._	3._	4._	5._	8._
17. Pharmacy/ Drugstore	<i>1-5 min</i>	<i>6-10 min</i>	<i>11-20 min</i>	<i>20-30 min</i>	<i>30+ min</i>	<i>don't know</i>
	1._	2._	3._	4._	5.	8._
18. Salon/ Barbershop	<i>1-5 min</i>	<i>6-10 min</i>	<i>11-20 min</i>	<i>20-30 min</i>	<i>30+ min</i>	<i>don't know</i>
	1._	2._	3._	4._	5._	8._
19. Your job or school [check here ___ if not applicable]	<i>1-5 min</i>	<i>6-10 min</i>	<i>11-20 min</i>	<i>20-30 min</i>	<i>30+ min</i>	<i>don't know</i>
	1._	2._	3._	4._	5._	8._
20. (Closest) Bus (Stop) or Train stop	<i>1-5 min</i>	<i>6-10 min</i>	<i>11-20 min</i>	<i>20-30 min</i>	<i>30+ min</i>	<i>don't know</i>
	1._	2._	3._	4._	5._	8._

21. Park	<i>1-5 min</i> 1._	<i>6-10 min</i> 2._	<i>11-20 min</i> 3._	<i>20-30 min</i> 4._	<i>30+ min</i> 5._	<i>don't know</i> 8._
22. Recreation Center (eg. Boys and Girls Club)	<i>1-5 min</i> 1._	<i>6-10 min</i> 2._	<i>11-20 min</i> 3._	<i>20-30 min</i> 4._	<i>30+ min</i> 5._	<i>don't know</i> 8._
23. Gym or Fitness Facility	<i>1-5 min</i> 1._	<i>6-10 min</i> 2._	<i>11-20 min</i> 3._	<i>20-30 min</i> 4._	<i>30+ min</i> 5._	<i>don't know</i> 8._

C. Access to services

*Please **give me** the answer that best applies to you and your neighborhood. Both **local** and **within walking distance** mean within a 10-15 minute walk from your home.*

1. Stores are within easy walking distance of my home.

1	2	3	4
Strongly disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree

2. There are many places to go within easy walking distance of my home.

1	2	3	4
Strongly disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree

3. It is easy to walk to a transit stop (bus, train) from my home.

1	2	3	4
Strongly disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree

D. Streets in my neighborhood

*Please **tell me** the answer that best applies to you and your neighborhood.*

1. The distance between intersections (streets that connect to each other) in my neighborhood is usually short (100 yards or less; the length of a football field or less).

1	2	3	4
strongly disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree

2. There are many alternative routes for getting from place to place in my neighborhood. (I don't have to go the same way every time.)

1	2	3	4
strongly disagree	Somewhat Disagree	Somewhat agree	Strongly Agree

E. Places for walking and cycling

Please tell me the answer that best applies to you and your neighborhood.

1. There are sidewalks on most of the streets in my neighborhood.

1	2	3	4
strongly disagree	Somewhat Disagree	Somewhat agree	Strongly Agree

2. Sidewalks are separated from the road/traffic in my neighborhood by parked cars.

1	2	3	4
strongly disagree	Somewhat Disagree	somewhat agree	Strongly Agree

3. There is a grass/dirt strip that separates the streets from the sidewalks in my neighborhood.

1	2	3	4
strongly disagree	Somewhat Disagree	somewhat agree	Strongly Agree

4. My neighborhood streets are well lit at night.

1	2	3	4
strongly disagree	Somewhat Disagree	somewhat agree	Strongly Agree

5. Walkers and bikers on the streets in my neighborhood can be easily seen by people in their homes.

1	2	3	4
strongly disagree	Somewhat Disagree	somewhat agree	Strongly Agree

6. There are crosswalks (marked area on streets for crossing) and pedestrian signals (lights that tell when to cross) to help walkers cross busy streets in my neighborhood.

1	2	3	4
strongly disagree	Somewhat Disagree	somewhat agree	Strongly Agree

F. Neighborhood surroundings/aesthetics

Please circle the answer that best applies to you and your neighborhood.

1. There are trees along the streets in my neighborhood.

1	2	3	4
strongly disagree	Somewhat Disagree	somewhat agree	Strongly Agree

2. There are many interesting things to look at while walking in my neighborhood.

1	2	3	4
strongly disagree	Somewhat Disagree	somewhat agree	Strongly Agree

3. There are many attractive natural sights in my neighborhood (such as landscaping views (plants and trees)).

1	2	3	4
strongly disagree	Somewhat Disagree	somewhat agree	Strongly Agree

4. There are attractive (good-looking) buildings/homes in my neighborhood.

1	2	3	4
strongly disagree	Somewhat Disagree	somewhat agree	Strongly Agree

G. Traffic hazards

Please circle the answer that best applies to you and your neighborhood.

1. There is so much traffic along nearby streets that it makes it difficult or unpleasant to walk in my neighborhood.

1	2	3	4
strongly disagree	Somewhat Disagree	somewhat agree	Strongly Agree

2. The speed of traffic on most nearby streets is usually slow (30 mph or less).

1	2	3	4
strongly disagree	Somewhat Disagree	somewhat agree	Strongly Agree

3. Most drivers exceed the posted speed limits while driving in my neighborhood.

1	2	3	4
strongly disagree	Somewhat Disagree	somewhat agree	Strongly Agree

H. Crime

1. There is a high crime rate in my neighborhood.

1	2	3	4
strongly disagree	Somewhat Disagree	somewhat agree	Strongly Agree

2. The crime rate in my neighborhood makes it unsafe to go on walks during the day.

1	2	3	4
strongly disagree	Somewhat Disagree	somewhat agree	Strongly Agree

3. The crime rate in my neighborhood makes it unsafe to go on walks at night.

1	2	3	4
strongly disagree	Somewhat Disagree	somewhat agree	Strongly Agree

Single items that did not load on other factors

1. Parking is difficult in local shopping areas

1	2	3	4
strongly disagree	Somewhat Disagree	somewhat agree	Strongly Agree

2. The streets in my neighborhood do not have many cul-de-sacs (dead-end street)

1	2	3	4
strongly disagree	Somewhat Disagree	somewhat agree	Strongly Agree

3. The streets in my neighborhood are hilly, making my neighborhood difficult to walk in.

1	2	3	4
strongly disagree	Somewhat Disagree	somewhat agree	Strongly Agree

4. There are major barriers to walking in my local area that make it hard to get from place to place (for example, freeways, railway lines, rivers).

1	2	3	4
strongly disagree	Somewhat Disagree	somewhat agree	Strongly agree

Appendix G

Adapted Social Support for Exercise Survey

In the last 3 months, how often has your family, friends and partner said or done each of the following?

1. Exercised with you?

	Never	Rarely	A Few Times	Often	Very Often	Does not Apply
Family	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>
Friends	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>
Partner	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>

2. Offered to exercise with you?

	Never	Rarely	A Few Times	Often	Very Often	Does not Apply
Family	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>
Friends	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>
Partner	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>

3. Reminded you to exercise?

	Never	Rarely	A Few Times	Often	Very Often	Does not Apply
Family	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>
Friends	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>
Partner	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>

4. Reminded you to continue with your exercise program?

	Never	Rarely	A Few Times	Often	Very Often	Does not Apply
Family	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>
Friends	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>
Partner	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>

5. Changed their schedule so you could exercise together?

	Never	Rarely	A Few Times	Often	Very Often	Does not Apply
Family	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>
Friends	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>
Partner	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>

6. Talked about exercise with you?

	Never	Rarely	A Few Times	Often	Very Often	Does not Apply
Family	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>
Friends	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>
Partner	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>

7. Complained about the time you spend exercising?

	Never	Rarely	A Few Times	Often	Very Often	Does not Apply
Family	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>
Friends	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>
Partner	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>

8. Criticized you or made fun of you for exercising?

	Never	Rarely	A Few Times	Often	Very Often	Does not Apply
Family	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>
Friends	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>
Partner	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>

9. Gave you rewards for exercising (brought you something or gave you something you like)?

	Never	Rarely	A Few Times	Often	Very Often	Does not Apply
Family	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>
Friends	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>
Partner	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>

10. Planned for exercise on recreational trips (e.g. vacation, hiking)?

	Never	Rarely	A Few Times	Often	Very Often	Does not Apply
Family	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>
Friends	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>
Partner	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>

11. Helped plan activities around your exercise?

	Never	Rarely	A Few Times	Often	Very Often	Does not Apply
Family	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>
Friends	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>
Partner	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>

12. Asked you for ideas on how they can get more exercise?

	Never	Rarely	A Few Times	Often	Very Often	Does not Apply
Family	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>
Friends	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>
Partner	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>

13. Talked about how much they like to exercise?

	Never	Rarely	A Few Times	Often	Very Often	Does not Apply
Family	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>
Friends	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>
Partner	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	8 <input type="checkbox"/>

Appendix H

Attitudinal Familism Scale

Please circle the response that best describes your personal views about each particular statement. Please answer as honestly as possible. Please respond by using any of the numbers between 1 and 10.

1. Children should always help their parents with the support of younger brothers and sisters, for example, help them with homework, help the parents take care of the children, etc.

1	2	3	4	5	6	7	8	9	10
strongly disagree		disagree		somewhat disagree	somewhat agree		agree		strongly agree

2. The family should control the behavior of children under the age of 18.

1	2	3	4	5	6	7	8	9	10
strongly disagree		disagree		somewhat disagree	somewhat agree		agree		strongly agree

3. A person should cherish the time they spend with his or her relatives.

1	2	3	4	5	6	7	8	9	10
strongly disagree		disagree		somewhat disagree	somewhat agree		agree		strongly agree

4. A person should live near his or her parents and spend time with them on a regular basis.

1	2	3	4	5	6	7	8	9	10
strongly disagree		disagree		somewhat disagree	somewhat agree		agree		strongly agree

5. A person should always support members of the extended family, for example, aunts, uncles, and in-laws, if they are in need, even if it is a big sacrifice.

1	2	3	4	5	6	7	8	9	10
strongly disagree		disagree		somewhat disagree	somewhat agree		agree		strongly agree

6. A person should rely on his or her family if the need arises.

1	2	3	4	5	6	7	8	9	10
strongly disagree		disagree		somewhat disagree	somewhat agree		agree		strongly agree

7. A person should feel ashamed if something he or she does dishonors the family name.

1	2	3	4	5	6	7	8	9	10
strongly disagree		disagree		somewhat disagree	somewhat agree		agree		strongly agree

8. Children should help out around the house without expecting an allowance.

1	2	3	4	5	6	7	8	9	10
strongly disagree		disagree		somewhat disagree	somewhat agree		agree		strongly agree

9. Parents and grandparents should be treated with great respect regardless of their differences in views.

1	2	3	4	5	6	7	8	9	10
strongly disagree		disagree		somewhat disagree	somewhat agree		agree		strongly agree

10. A person should often do activities with his or her immediate and extended families, for example, eat meals, play games, or go somewhere together.

1	2	3	4	5	6	7	8	9	10
strongly disagree		disagree		somewhat disagree	somewhat agree		agree		strongly agree

11. Aging parents should live with their relatives.

1	2	3	4	5	6	7	8	9	10
strongly disagree		disagree		somewhat disagree	somewhat agree		agree		strongly agree

12. A person should always be expected to defend his/her family's honor no matter what the cost.

1	2	3	4	5	6	7	8	9	10
strongly disagree		disagree		somewhat disagree	somewhat agree		agree		strongly agree

13. Children below 18 should give almost all their earnings to their parents.

1	2	3	4	5	6	7	8	9	10
strongly disagree		disagree		somewhat disagree	somewhat agree		agree		strongly agree

14. Children should live with their parents until they get married.

1	2	3	4	5	6	7	8	9	10
strongly disagree		disagree		somewhat disagree	somewhat agree		agree		strongly agree

15. Children should obey their parents without question even if they believe that they are wrong.

1	2	3	4	5	6	7	8	9	10
strongly disagree		disagree		somewhat disagree	somewhat agree		agree		strongly agree

16. A person should help his or her elderly parents in times of need, for example, help financially or share a house.

1	2	3	4	5	6	7	8	9	10
strongly disagree		disagree		somewhat disagree	somewhat agree		agree		strongly agree

17. A person should be a good person for the sake of his/her family.

1	2	3	4	5	6	7	8	9	10
strongly disagree		disagree		somewhat disagree	somewhat agree		agree		strongly agree

18. A person should respect his or her older brothers and sisters regardless of their differences in views.

1	2	3	4	5	6	7	8	9	10
strongly disagree		disagree		somewhat disagree	somewhat agree		agree		strongly agree

Appendix I

Demographic Data Collection Form

ID Number	Date	Interviewer

Please answer the following questions by telling me your best answer.

Age:

1. How old are you? _____

Marital status:

2. Which of the following describes your marital status?

1. <input type="checkbox"/> never married/not living with a partner	2. <input type="checkbox"/> never married/living with a partner
3. <input type="checkbox"/> separated or divorced/not living with a Partner	4. <input type="checkbox"/> separated or divorced/living with a partner
5. <input type="checkbox"/> married/living with present partner	6. <input type="checkbox"/> widowed/living alone
7. <input type="checkbox"/> widowed/living with a partner	8. <input type="checkbox"/> other, describe _____

Ethnicity:

3. How would you describe your ethnic background? You may choose more than one.

1. <input type="checkbox"/> Mexican American	2. <input type="checkbox"/> Mexican
3. <input type="checkbox"/> Latino	4. <input type="checkbox"/> Hispanic
5. <input type="checkbox"/> Spanish	6. <input type="checkbox"/> Other

Health Status:

4. How would you rate your health?

1. <input type="checkbox"/> poor	2. <input type="checkbox"/> fair
3. <input type="checkbox"/> good	4. <input type="checkbox"/> very good
5. <input type="checkbox"/> excellent	6. <input type="checkbox"/> no answer

Health Conditions:

5. Were you ever told by a doctor or health care professional that you have any of the following health conditions? (CHECK ALL THAT APPLY)

1. <input type="checkbox"/> heart attack	2. <input type="checkbox"/> heart failure or CHF
3. <input type="checkbox"/> blood clot in the legs or DVT	4. <input type="checkbox"/> blood clot in brain or Stroke
5. <input type="checkbox"/> shortness of breath (Asthma or COPD)	6. <input type="checkbox"/> high blood sugar or diabetes
7. <input type="checkbox"/> kidney disease or on dialysis	8. <input type="checkbox"/> high blood pressure or hypertension
9. <input type="checkbox"/> joint pain or Arthritis	10. <input type="checkbox"/> cancer
11. <input type="checkbox"/> depression	12. <input type="checkbox"/> seizures If yes, date of last _____
13. <input type="checkbox"/> anxiety	14. <input type="checkbox"/> no answer

6. Do you have any other health conditions? 1. yes 2. no (*Skip to Question 7*)
 3. If yes, tell me what they are: _____

7. Do you think any of these conditions have prevented you from being physically active?
 1. yes 2. no

8. Have any of the above conditions led to you becoming more physically active?
 1. yes 2. no

Current Medications:

9. Are you on any medications for these health conditions?
 1. yes 2. no (*Skip to question 10*)

9a. If yes, for what _____

Treatment and Health Insurance:

10. Is the medical care you receive for those health conditions adequate?
 1. yes 2. no

11. Do you have health insurance?
 1. yes 2. no

Physical Activity:

12. How does your physical activity over the past week compare to your usual physical activity during the past three months? 1. more 2. less 3. the same

Acculturation: Please choose one for each of the following questions:

13. In which language (s) do you speak?

1	2	3	4	5	6
Only Spanish	Spanish better than English	Both English and Spanish equally	English better than Spanish	Only English	Refused

14. In which language (s) do you read?

1	2	3	4	5	6	7
Only Spanish	Spanish better than English	Both Spanish and English equally well	English better than Spanish	Only English	Refused	I do not know how to read

Appendix J

University of California, Los Angeles
CONSENT TO PARTICIPATE IN RESEARCH
[Physical Activity Study on Women of Mexican descent]

Neomie C. Congello, MSN, RN and doctoral student from the School of Nursing at the University of California, Los Angeles (UCLA) is planning to conduct a research study to examine factors influencing physical activity. You were selected as a possible participant for the study because you are a woman of Mexican descent, between the ages of 18 and 64 and living with a partner. Your participation in this research is completely voluntary.

Why is this study being done?

The purpose of this study is to help us gain a better understanding of factors influencing physical activity that may lead to increased risk of cardiovascular disease. This study that will evaluate factors influencing the physical activity of women of Mexican background. We will be conducting interviews with women to complete questionnaires about the physical environment where they live, social support for physical activity that they receive from their friends, family and partner along with cultural beliefs about their family relationships. Finally, we will ask questions about their actual physical activity.

What will happen if I take part in the study?

If you volunteer to participate in the study, the researcher will ask you to do the following:

- You will participate in a one-to-one interview with a person on the research team
- If you prefer Spanish, a qualified bilingual and bicultural research assistant of Mexican descent will conduct the interview with you.
- The interviewer will ask you questions about yourself (e.g. age, marital status) to complete a sociodemographic form
- Next you and the interviewer will complete three other questionnaires followed by measurement of your height and weight
- The forms and questionnaires will be coded with an identification number instead of your name to maintain confidentiality of the information you provide.
- The interviewer will read each question pausing to give you time to respond and will assist you in interpreting words that you may not understand if necessary.
- Types of questions on the questionnaires will include kinds of houses (e.g. single family) and walking distances to businesses in your neighborhood; if your friends, family and partner offered to exercise with you or gave you helpful reminders to exercise; and if you think that time spent with relatives should be cherished.
- At the time of the interview, all women who participate in the study will be asked to pick a number without looking from a box with numbers ranging from 1 to 109.
- If you randomly choose a number between 1 and 20 and agree to participate in this part of the study, a pedometer will be sent home with you. A pedometer is a small device that you wear that counts your steps and you will be asked to wear it for one week.

- If you wear a pedometer you will be asked to perform your usual daily activities and to complete a daily physical activity log during this time. Oral and written instructions on how to wear the pedometer will be provided. We will ask for your phone number, current address and email address so we can contact you to arrange a time for you to return the pedometer. You will also be asked to provide the names, addresses and phone numbers of three relatives or friends who we may contact if we cannot reach you.
- The interview will be conducted at an agreed upon location that is private and convenient for you.

How long will I be in the study?

You will be involved in a one-time interview lasting approximately one hour. If you wear a pedometer you will be in the study for one week and your participation will end after you return the pedometer, physical activity log and complete a short questionnaire on physical activity.

Are there any potential risks or discomforts that I can expect from this study?

- There are small risks involved in participating in this research project. You may experience some discomfort when asked about support for physical activity received from your family and/or your partner. For example, you will be asked about whether or not your family and partner offered to exercise with you.
- In an effort to manage risks for discomfort, the interview will be conducted with you alone and all information will be kept confidential.
- Should any of these potential discomforts upset you your participation in the interview will stop.
- You do not have to answer questions or share any information that makes you uncomfortable.
- You may be withdrawn from the study should circumstances arise in which the researcher deems it necessary to do so.

Are there any potential benefits if I participate?

- There are no direct benefits to study participants. You may benefit from the study by gaining a better understanding about factors influencing physical activity among women of Mexican descent. Some examples of these factors include whether there are stores in the neighborhood that are within easy walking distance to homes and if family, friends and partner exercised or offered to be physically active with women.
- The results of the study may help to improve understanding of factors influencing physical activity in this population. Your participation can also potentially help in the development of future physical activity programs that includes support from partners for women of Mexican descent who are at risk for heart disease.
- The alternative to participation is not to participate in the study. If you elect not to participate you may gain information about physical activity from the American Heart Association or the Public Health Department in Ventura County.

Will I be paid for participating?

You will receive a \$10 Target gift card for participating in the study. If you wear a pedometer you will also receive another free pedometer after you return the original pedometer and physical activity log with information on your physical activity. At the end of the study, names of all the women who participated in the study will be written on slips of paper and placed in a box. A member of the research team will randomly select two names without looking and these women will each receive a \$25 Target gift card.

Will information about me and my participation be kept confidential?

- Any information that is obtained in connection with this study and that can identify you will remain confidential. It will be disclosed only with your permission or as required by law. Confidentiality will be maintained by means of a coding system that will use an identification number so that no information can be traced back to you.
- A locked file will be used to store hardcopies of your questionnaires and will only be accessed by the investigator and dissertation chair. A code book explaining data obtained during the interview will be kept in a separate locked file away from the questionnaires.

What are my rights if I take part in this study?

- You can choose whether or not you want to be in the study, and you may withdraw your consent and discontinue participation at any time.
- Whatever decision you make, there will be no penalty to you, and no loss of benefits to which you were otherwise entitled.
- You may refuse to answer any questions that you do not want to answer and still remain in the study.

Who can I contact if I have questions about this study?

- **The research team:**]
 - If you have any questions, comments or concerns about the research, you can talk to the research assistant, Justina Fuentes at (805)844-3017 or the investigator, Neomie Congello at (805)910-8643.
 - You may also contact Deborah Koniak-Griffin, RNC, EdD, FAAN who will be supervising this study. She may be reached by calling (310)206-3842.

- **UCLA Office of the Human Research Protection Program (OHRPP):**

If you have questions about your rights while taking part in this study, or you have concerns or suggestions and you want to talk to someone other than the researchers about the study, please call the OHRPP at (310) 825-7122 or write to:

UCLA Office of the Human Research Protection Program

11000 Kinross Avenue, Suite 211, Box 951694

Los Angeles, CA 90095-1694

If you would like to participate in the study and agree with information provided above please sign below on the dotted line.

.....

Signature of Participant

.....

*Signature of Investigator or
Research Assistant*

Please check the appropriate box below and initial:

_____ I agree to have my data stored for future use by the Principal Investigator, research team, and/or other researchers.

_____ I do not want my data stored for future use by the Principal Investigator, research team, and/or other researchers.

You will be given a copy of this information to keep for your records.

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