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Promotion of Physical Activity Among Mexican-Origin Women in Texas and South Carolina: An Examination of Social, Cultural, Economic, and Environmental Factors

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Interventions to improve physical activity levels among Latinos must take into consideration the social, cultural, economic, and environmental contexts of Latino communities. We report findings of formative assessments related to Mexican-origin women's levels of readiness, willingness, and ability to participate in regular leisure time physical activity in two diverse locations, the Texas Lower Rio Grande Valley and the South Carolina Midlands. The *ENLACE* project employed a Community-Based Participatory Research approach. Formative assessment activities focused on identification of community assets and resources and exploration of community members' experiences, opinions, values, preferences, and perceived needs related to physical activity. Data sources included windshield tours, walkability assessments of local neighborhoods; community inventory exercises, focus groups, and individual interviews. Barriers to regular physical activity included the *dominance of work and family responsibilities*, *social norms*, *lack of social support*, *social isolation*, *environmental constraints*, *economics*, and *low levels of personal knowledge and motivation.*

Latinos are the largest and fastest growing ethnic minority in the United States (US), comprising 15.1% of the population, and numbering more than 45.4 million people (U.S. Census Bureau, 2010a). By 2050, it is estimated that Latinos will comprise 24.4% (102.5 million) of the US population (U.S. Census Bureau, 2004). Of the current population of 45.4 million U.S. Latinos, 64% are of Mexican origin, constituting the largest subgroup of both native and foreign-born Latinos (Grieco, 2010). The heterogeneity among Latinos includes wide variations along diverse axes, from national origin, migration and settlement patterns, immigration status, and geographic context, to social class of family of origin, current socioeconomic status, race, educational level, and English language proficiency, among others. Understanding how the intersections of social, cultural, economic, and environmental factors impact health and behavior is necessary to design and implement appropriate health interventions for diverse Latino populations.

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In this paper we present findings from formative assessments of social, cultural, economic, and environmental factors related to levels of readiness, willingness, and ability to participate in regular leisure time physical activity (LTPA) among Mexican-origin women in two diverse geographic contexts, the Texas Lower Rio Grande Valley and the South Carolina Midlands. The *ENLACE* project was a multisite research study designed to foster community participation in intervention planning research. Using a community based participatory research (CBPR) approach, the aim was to inform the design of a theoretically-based, culturally appropriate, community-based physical activity (PA) intervention, subsequently piloted in both geographic settings. In the following sections we review the relevant research on LTPA among Latinos and describe the theoretical framework and research approach of the *ENLACE* project, the settings and contexts, and formative assessment procedures. We then present and discuss the relevant findings on social, cultural, economic, and environmental factors related to promotion of LTPA among Mexican-origin women in these two settings. We conclude the discussion with recommendations for practice and future research.

Leisure-Time Physical Activity Among Mexican-Origin Latinos

Epidemiological data and research findings indicate Mexican-Americans have higher rates of obesity, diabetes, and other chronic illnesses and are more sedentary than the general population. The age-adjusted prevalence of diagnosed type 2 diabetes among Mexican-Americans is almost twice that of non-Hispanic whites (11.9% vs. 6.6%; National Institute of Diabetes and Digestive and Kidney Diseases, 2008). Among Mexican-American adults age 20 and older, 77.5% are overweight and obese and 39.3% obese, with women 40–59 years having the highest rates (48.9%) of obesity (Flegal, Carroll, Ogden, & Curtin, 2010). Engaging in daily moderate to vigorous physical activity (MVPA) can prevent weight gain and improve overall physical and mental well-being (Jakicic, et al., 2001; USDHHS, 1996, 2000). There is consistent evidence that programs of increased PA and modest weight loss reduce the incidence of type 2 diabetes (Helmrich, Ragland, Leung, & Paffenbarger, 1991; Sigal, Kenny, Wasserman, Castaneda-Sceppa, & White, 2006). To promote health, the American College of Sports Medicine recommends that all healthy adults aged 18–65 years need moderate-intensity aerobic (endurance) physical activity for a minimum of 30 minutes on five days each week or vigorous-intensity aerobic physical activity for a minimum of 20 minutes on three days each week (Haskell, et al., 2007). Despite evident benefits of MVPA, lifestyle indicators show Latinos have among the highest rates of sedentary lifestyle (53.2%; Adams & Schoenborn, 2006).

There is substantial evidence indicating disparate rates of PA in general, as well as LTPA, among U.S. Latinos. Recent national data (Centers for Disease Control and Prevention [CDC], 2009) indicated only 46.5% of adult Latinos met current PA recommendations, compared with 51.8% of Non-Hispanic Whites. Earlier data from 2005 indicated 56% of Latinos reported a total absence of LTPA, by far the highest for any racial or ethnic group (Barnes, 2010). Conversely, only 18% of Latinos (18 or older) reported regular vigorous PA three or more times per week, contrasted to

26% of Whites (Adams & Schoenborn, 2006). Data from the 2000–2003 National Health Interview Surveys indicated lower levels of PA across all Hispanic subgroups when compared with Non-Hispanic Whites (Neighbors, Marquez, & Marcus, 2008). However, there was wide variation within the Hispanic subgroups. Those who self-identified as Mexican-American reported the highest levels of LTPA, compared with Cubans and Dominicans, who reported the lowest levels. Findings from research focused exclusively on Latinos indicate overall gender differences in PA patterns, with women being less active than men (Crespo, Smit, Carter-Pokras, & Anderson, 2001; Marquez & McAuley, 2006a). Not surprisingly, when compared with men, women had lower levels of occupation-related PA and greater household-related PA; furthermore, socioeconomic covariates had a much smaller effect on LTPA among women than men (Crespo, et al., 2001; Marquez & McAuley, 2006a). Possible explanations for the disparate levels of regular PA among Latinas range from cultural processes and practices, gender roles, and language barriers to limited social and economic resources, lack of exposure to PA-specific health education, and structural and environmental barriers.

Acculturation is the process and degree to which immigrants integrate and incorporate values, attitudes, beliefs, and practices of the host society into their lives (Peragallo, Fox, & Alba, 2000). There is some evidence that acculturated individuals are more likely to engage in LTPA compared with less acculturated counterparts (Crespo, et al., 2001; Evenson, Sarmiento, Tawney, Macon, & Ammerman, 2003; Eyler, et al., 2002; Hovell, et al., 1991) although the specific factors contributing to an increase in PA are not clear. One possible reason is that acculturated Latinos may be exposed to education about the importance of PA and its role in prevention (Satia, Patterson, Neuhouser, & Elder, 2002). Acculturation is often measured by single-item proxy measures (e.g., place of birth, length of time in the US, or language preference). Ethnic identification, values, and structural location have also been incorporated into several multivariate acculturation scales (Cuellar, Harris, & Jasso, 1980; G Marin & Gamba, 1996; G Marin, Sabogal, Marin, Ortero-Sabogal, & Perez-Stable, 1987; Mendoza, 1989). Although acculturation is one of the most frequent variables in studies of immigrant health, there has been little progress toward increasing substantive knowledge about the complex relationships between acculturation and health (Messias & Rubio, 2004). Inconsistent research findings on the impact of acculturation on health, including physical activity, may be attributed to lack of standardization, reliability and validity of acculturation measures as well as the diversity of acculturation measurement scales (G Marin & Gamba, 1996; Peragallo, et al., 2000). Some researchers suggest that education may have important modifying effects on the relationship between acculturation and health behavior (Castro, Cota, &Vega, 1999; Lopez, Bryant, & McDermott, 2008).

To date most PA research has focused on individual level correlates of physical activity (Chasan-Taber, et al., 2007; Evenson, et al., 2003; Eyler, et al., 2002; Hovell, et al., 1991; Marquez & McAuley, 2006a, 2006b; Mier, Ory, Zhan, Wang, & Burdine, 2007; Wilbur, Chandler, Dancy, & Lee, 2003). There is, however an increased recognition on the importance of the social and physical environment (Lopez, et al., 2008; Martinez, Arredondo, Perez, & Baquero, 2009; Pichon, et al., 2007; Sallis, Bauman, & Pratt, 1998). Studies focused specifically on Latinas suggest limited English proficiency, household responsibilities, child care, and lack of free time and transportation are common barriers to regular engagement in

PA (Evenson, Saramiento, Macon, Tawney, & Ammerman, 2002; Juarbe, Turok, & Pérez-Stable, 2002; Jurkowski, Mosquera, & Ramos, 2010; Keller & Fleury, 2006; Martinez, et al., 2009; Ramirez, Chalela, Gallion, & Velez, 2007). Specific sociocultural deterrents to Latinas' engagement in regular PA include more traditional gender role expectations (Juarbe, et al., 2002; Martinez, et al., 2009) and low levels or nonexistent social support for PA from family members (Evenson, et al., 2002; Juarbe, et al., 2002; Ramirez, et al., 2007). Environmental barriers include living in unsafe neighborhoods and lack of access to exercise facilities (Evenson, et al., 2002; Martinez, et al., 2009; Ramirez, et al., 2007).

Individuals of Mexican origin are more likely to experience barriers to lifestyle behavior change as a result of socioeconomic and sociocultural inequalities than the general U.S. population. For example, the proportion of Mexicans living in poverty is 22.3%, compared with 12.7% in the general U.S. population; 34.8% of Mexicans do not have health insurance, over twice that (15.4%) of the general U.S. population (Pew Hispanic Center, 2010a). These inequities influence access to medical care, quality of medical care, availability of and access to transportation, and knowledge regarding or time for self-care, including regular participation in LTPA. In any given context, it is likely that the level of engagement in regular LTPA by Latinas is influenced by the complex interactions of multiple factors at the individual, family, and community levels.

A Social-Ecological Framework for Physical Activity Interventions Among Latino Populations

Social-ecological frameworks (McLeroy, Bibeau, Steckler, & Glanz, 1988; Sallis, et al., 1998; Sallis & Owen, 1997) are considered to be appropriate for addressing the complex, multilevel interactions related to individual behaviors such as PA within the contexts of specific ethnic minority populations. From a social-ecological perspective, behaviors—including health behaviors—are acquired and maintained through a complex and interactive set of intrapersonal (individual), interpersonal, institutional, community, public policy, and environmental factors. Taking a socioecological approach to health allows researchers and public health practitioners to address factors such as poverty, socioeconomic inequities, and cultural values and beliefs and, ideally, to design interventions to change and sustain health behaviors that target multiple levels simultaneously. However, there are few reports of the successful implementation of such studies (McLeroy, et al., 1988). By approaching the design and implementation of the *ENLACE* project from a socioecological perspective, we maintained a focus on social, economic, cultural, and environmental contexts and influences throughout the various phases of the project, beginning with the diverse geographic and demographic contexts of the research.

Research Contexts and Settings

The *ENLACE* program was situated in two geographically distinct areas: the Texas Lower Rio Grande Valley (LRGV), an established Latino settlement area on the U.S./Mexico border and the South Carolina Midlands, an emerging settlement

area with a small proportion but an exceptionally high growth rate of Hispanics over the past 15 years. Latinos are the dominant ethnic group (86–90%) in the LRGV (see Table 1) and the majority (68%) is native-born (U.S. Census Bureau, 2010a). In contrast, the Latino population in the South Carolina Midlands is small (4%) and fewer are native-born (51%) (U.S. Census Bureau, 2010a). In Texas the median age of native-born Hispanics is 19 years compared with 11 years among South Carolina native-born Hispanics (Pew Hispanic Center, 2010b). Thus, Latinos in Texas represent a dominant, stable, and growing population, in contrast to the rapidly growing influx of new Latino immigrants in South Carolina.

These two distinct regions represent different economic, societal, and psychosocial environments and contexts of Mexican settlement in the U.S. The Texas LRGV is a longstanding border settlement area, with a well-established Mexican culture and large numbers of Spanish speakers and Spanish-English bilinguals. Within this linguistic, social, and cultural environment, Mexican immigrants and Mexican-Americans have greater access to multigenerational support within their families and communities and face fewer access barriers to health and human services. In contrast are the emerging "new settlement" areas of the Southeast (e.g., Georgia, North Carolina, and South Carolina), where in the last decade of the 20th Century there was a rapid influx of Latino job-seekers to a region with very insignificant prior Latino presence. These new immigrants, the majority from rural Mexico and Central America, arrived to work in the booming construction and tourism businesses, but settled in communities with educational, health, legal, and social services infrastructures with minimal or no cultural and linguistic resources. To date, most of the public health research with Hispanics has been situated in the more mature settlement areas (e.g., Texas, Florida, and California), with a small but growing body of research focused on new settlement populations (Jurkowski, et al., 2010). Because Latinos living in different geographic, social, cultural, and economic contexts may experience unique challenges to engaging in PA, further research is needed to explore the potential influence of ethno-regional factors (Martinez, et al., 2009). In approaching the *ENLACE* project, we were conscious of the disparate social contexts of these two settings, and were attentive to implications of implementing similar approaches and interventions across two distinct social and environmental contexts (Elder, Ayala, Parra-Medina, & Talavera, 2009; Odem & Lacy, 2009).

Table 1 Population Characteristics of Counties Included in ENLACE Compared With the State

	Columbia, MSA			Lower Rio Grande Valley		
Characteristic	Richland County	Lexington County	South Carolina	Hidalgo County	Cameron County	Texas
Total population	372,023	255,607	4,561,242	741,152	396,371	24,782,302
Hispanic	4%	4%	4%	90%	86%	36%
Mexican origin (% of Hispanics)	45%	72%	62%	88%	94%	88%

Approach: Community-Based Participatory Research

In Spanish, *ENLACE* means to link, connect, or be joined in Spanish. The title was fitting for this two-year intervention planning study involving partnerships between the University of South Carolina with the South Carolina Hispanic/Latino Health Coalition, and University of Texas Health Sciences Center at San Antonio with the LRGV *Colonias Promotora* Program. Both community-partner organizations had a grant subcontract which covered staff salaries/stipends and other related program expenses. The research was approved by Institutional Review Boards of the University of South Carolina and the University of Texas Health Science Center at San Antonio. We designed and implemented the *ENLACE* project with a Community-Based Participatory Research (CBPR) approach, which required community input and involvement in all phases of the project.

Although often referred to as a model or a research method, CBPR may be better described as an action-oriented approach that governs how research is conducted (Minkler & Wallerstein, 2002). When using this model, the community has a direct influence on the development, planning, implementation, measurement, and dissemination of the proposed research. Researchers and community members combine their knowledge and assets to work together as colleagues to identify key problems to be studied, formulate research questions in culturally sensitive ways, and use study results to help support relevant program and policy development or social change (Minkler & Wallerstein, 2002; Viswanathan, et al., 2004). In contrast with traditional research and interventions, CBPR involves "insiders" in development, implementation, and evaluation activities. Unlike traditional research approaches where scientists "swoop down" into the community, carefully controlling every aspect of the research, and then pick up and leave when the research is finished, the CBPR approach engages the community such that it equally influences each stage of the research process. Community involvement and incorporation of community members' diverse skills, knowledge, and expertise can lead to enhanced and more trusting communication and relationships between academic and community partners; more culturally appropriate interventions; greater community interest and support; and ideally, to more sustainable strategies for improved health and well-being (Horowitz, Robinson, & Seifer, 2009). Successful CBPR involves shared data ownership and dissemination of findings as well as mutual benefits that extend to all parties and continue after the specific study or funding period ends. However, CBPR is labor- and time-intensive for all involved. In the process, community partners and academic researchers alike may face challenges of cultural and communication barriers as well as other differences and inequities embedded within their disparate contexts, such as financial inequities; social class differences; and opposing priorities and perspectives. To be successful, partners must find ways to balance competing or conflicting perspectives with a common vision and shared goals (Horowitz, et al., 2009; Norris, et al., 2007; Ross, et al., 2009).

The *ENLACE* CBPR planning model involved four phases (Figure 1). The project involved several formal and informal mechanisms and levels of community-campus partnerships at both sites. These included community mobilization and input through Program Advisory Teams (PAT), community liaisons, and *promotoras de salud* (lay health advisors). In the LRGV, representatives included formal leaders from the county health department, county council and school district and informal

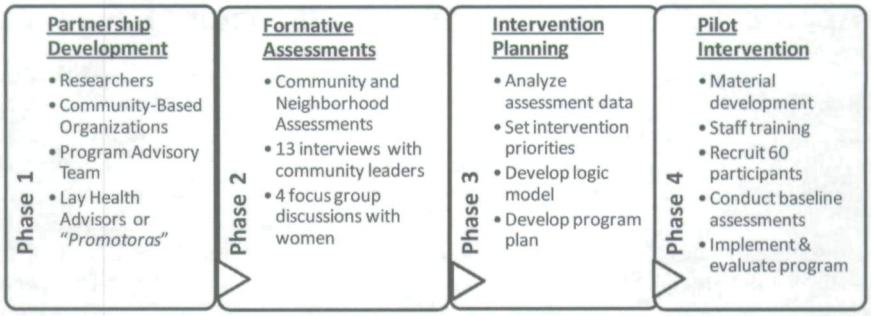

Figure 1 — *ENLACE* 4 phase intervention planning model.

leaders from various community-based organizations that provide outreach and education programs. Most representatives were bilingual/bicultural Latino natives of the region. In South Carolina, members of the PAT included representatives from various local Hispanic-serving nonprofits and faith-based groups, the majority being Latinas, as well as representatives from local public health programs and initiatives focusing on minority health, physical activity and exercise, and nutrition. In contrast, these participants were primarily non-Hispanic.

In Phase 1, a group of four lay health advisors or *promotoras,* two from each site, were recruited to participate in the planning and implementation of the formative assessments. The *promotoras* were Mexican-origin women living in the local communities who met certain requirements (e.g., literate and fluent in Spanish; past experience in community outreach and involvement with other Mexican-origin women; available for meetings and activities at various times, including evenings and weekends). *ENLACE promotoras* had specific roles and expectations. They attended required training sessions and supervisory meetings; successfully completed a research ethics training; identified and recruited program participants in their local neighborhoods and through their personal social networks; assisted in the research component (e.g., interviewed potential participants to screen for eligibility and participated in the baseline and postintervention assessments); served as the leaders of the community-based PA intervention; and submitted monthly program activity reports to the *ENLACE* Community Liaison with the community-partner organization.

Formative Assessment Processes and Activities

The aims of the participatory formative assessments conducted during Phase 2 were to identify community assets and resources and explore individual community members' experiences, opinions, values, preferences, and perceived needs related to PA (Sharpe, Greaney, Lee, & Royce, 2000). Program Advisory Team participation and input were integral to the community and individual-level formative assessments conducted at both sites. PAT members engaged in participatory data-generating activities (e.g., windshield tours, walkability assessments of local neighborhoods; community inventory exercises, group brainstorming and analysis activities) and provided direct input into the assessment and planning phases (e.g., opinions,

program information, snow-ball referrals and contacts). We gathered information from other sources (e.g., census reports, epidemiological profiles, health statistics, crime reports, local newspapers, and organizational web-sites) and shared these data with the PAT members.

At the community level, the "lay of the land" assessment focused on recognizing community landmarks, gathering spots, and symbols; uncovering patterns of community-organizational trust and distrust; identifying formal and informal community leaders, gatekeepers, and trusted advisors; and recognizing critical community issues and concerns. More specifically, we were interested in describing the community health, social, and economic status and identifying community assets, resources, barriers, and problems related to the ability of individuals and groups becoming more physically active in the community. At the individual level, we were interested in further understanding experiences, opinions, values, and perceived needs and preferences related to PA among Latino women in the community.

We conducted semistructured interviews with community leaders and representatives and focus groups with Mexican-origin women at each site. Interview participants were recruited through referrals from members of the PAT and using a snowball sampling. Trained bilingual research staff members were responsible for recruitment and conducting the interviews. We completed 26 key informant interviews across the two sites, 14 in Texas and 12 in South Carolina; the majority of the interviews were conducted in Spanish. The majority of interviewees were women (92.3%) and Hispanic (76.9%), mean age was 44.3 years (*SD* =9.9 years) and 34.5% had less than or equal to a high school education.

To elicit the perspectives of women representative of the target population (e.g., Mexican-origin women living in the communities), we conducted a total of eight focus groups; four at each site. Within each site we held focus groups in two distinct neighborhoods to capture environmental diversity and variation; similarly, to examine age-related perspectives, in each neighborhood we conducted one focus group for younger women (18–40 years) and another group for older women (>40 years). *Promotoras* were responsible for identifying and recruiting eligible participants. When participants arrived at the site, the *promotoras* greeted them, provided refreshments, and assisted in completing informed consent and demographic forms. Trained bilingual staff members facilitated the audio-taped focus groups in Spanish and also served as note-takers. Each focus group lasted approximately two hours. At the conclusion of the session, participants were compensated with a $20 gift-card. Bilingual professionals transcribed the all interview and focus group audio recordings in the original language.

The analysis of these qualitative data involved open coding of individual interview and focus group transcripts from both sites. We developed a coding scheme (provide examples of codes) and subsequently coding of all transcripts using common coding scheme using *Atlas.ti* (ATLAS.ti Scientific Software Development, 2009*)* and conducted constant comparative analyses within and across transcripts and sites (Strauss & Corbin, 1998). The analysis was conducted in the source language of the transcripts; quotations that appear in the findings were subsequently translated into English. We identified themes common to both sites and site-specific themes. In addition, the primary investigator at each site facilitated a debriefing session with the *promotoras* to gather their perspectives on the focus group discussion. Demographic data from focus group participants were analyzed using SPSS (SPSS Statistics, 2010).

Sample Demographics

The combined sample of focus group participants consisted of 69 Latinas. The demographic characteristics of focus groups participants by site are presented in Table 2. There were several noteworthy differences between the two sites. One-third of the Texas participants were U.S.-born, compared to none of the South Carolina participants. Among women that were foreign born in both sites, those in South Carolina had lived in the US on average 6.6 years compared with 12.3 years for Texas. Compared with South Carolina, participants in Texas were more likely to be married, unemployed and had more children in the household.

Findings: Cultural, Social, Economic, and Environmental Factors and Physical Activity

These multiple, overlapping formative assessment processes provided data on a variety of social, cultural, environmental, and economic factors that impact Latinas' participation in regular LTPA. Across both geographical and social contexts, the data supported common themes related to Mexican-origin women's ability, interest, and support for participation in LTPA. These common themes were the *dominance of work and family responsibilities and accompanying time constraints*; *perceived social norms and lack of social support*; *social isolation and environmental*

Table 2 Demographic Profile of ENLACE Focus Group Participants

Variable	South Carolina (*N* = 33)	Texas (*N* = 36)	*p*-value
Age (years)	39.5 ± 9.7	38.5 ± 11.1	n.s.
Country of origin			
US	0%	33.3%	< 0.001
Mexico	78.8%	63.9%	
Other	21.2%	2.8%	
Years in the U.S. among foreign born	6.6 ± 4.4	12.3 ± 7.2	< 0.01
Marital status			
% married	37.5%	75.0%	< 0.01
% living with partner	28.1%	5.6%	
% single	25.0%	11.1%	
% divorced/separated	9.4%	8.3%	
% employed	59.4%	21.1%	< 0.01
Monthly income	$1,085 ± $903	$1,296 ± $1,326	n.s.
Years educ. completed	8.7 ± 4.5	9.8 ± 3.2	n.s.
Household size	4.7 ± 1.8	5.4 ± 1.6	n.s.
# children in household	1.4 ± 0.9	2.1 ± 1.6	< 0.05
Health status	2.3 ± 1.2	2.9 ± 0.9	< 0.05

constraints; *economics*; and *low levels of personal knowledge, skills, and motivation*, many of which contributed to *access barriers*. Each of these major themes was evident in the data collected at each site, although there were some regional variations on each theme. In the following sections we examine these themes within the context of the social-ecological framework that guided the research. We then discuss implications for practice and further research.

The Dominance of Work and Family Responsibilities and Accompanying Time Constraints

The dominance of work was reflected in women's reports of their responsibilities at home and in the workplace. It was not only that women felt they did not have the "time" to participate in LTPA because of their multiple workloads. Social and cultural expectations regarding women's primary responsibility to family, rather than to self, reinforced the perception that there was "no time" for LTPA in their lives. Homemakers in both settings identified "lack of time" due to their family responsibilities as a major barrier to participation in any type of PA. In South Carolina, where many of the participants were recent immigrants with limited economic resources who had come to the area seeking employment, a predominant focus of women's energies was seeking and maintaining paid employment. This nearly single-minded focus on employment was evident in their narratives and was often related to the perceived lack of time for LTPA. The lack of overt social or cultural support or motivation from family, friends, or the broader community further reinforced the notion that participation in LTPA was not congruent with women's primary family and work responsibilities.

Perceived Social Norms and Lack of Social Support

Perceived social norms and lack of social support were important social factors related to Latinas' ability and willingness to participate in LTPA in both settings. Participants reflected traditional cultural notions about gender roles (e.g., a woman's role is to be a good wife and mother and her place is in the home). The corollary of this internalized expectation of women's primary role responsibility (e.g., caring for others) was that "doing something for me" could be interpreted as being selfish. A tendency for self-deprecation and devaluing was evident in women who described themselves as "lazy," "tired and exhausted," or not valuing their own health.

Further confirmation of women's traditional gender roles was the lack of exposure to or awareness of friends or family engaging in PA. For some respondents, the notion of exercising in public carried the risk of being judged negatively by others. For example some women reported they were embarrassed to be seen out walking in public where others might observe them and note, "she must not have anything to do." Lack of active social support, from male partners/husbands and from female friends further confirmed this perceived social constraint on the acceptability of LTPA among these Latinas. Some women reported that their partners would not encourage or engage in PA with them, or in some cases, would actually restrict their mobility outside the household due to safety concerns, jealousy, or insecurity. Compounding the lack of personal social support was the lack of available role models or wider public exposure to other Latinas engaging in LTPA in the community.

Social Isolation and Environmental Constraints

The personal and collective narratives indicated social isolation was an issue and concern for these Mexican-origin women. At both sites, lack of access to public or private transportation limited women's engagement and involvement in the broader community. In South Carolina, more salient contributors to social isolation included language barriers and an overriding fear and distrust of public exposure. Undocumented immigration status and limited English proficiency contributed to generalized fear and lack of trust in others, including police, government officials, and those of the dominant racial/ethnic groups. Personal experiences of discrimination and racism further consolidated social barriers between relatively recent Latina immigrants and the larger community. The lack of culturally and linguistically appropriate PA options (e.g., aerobic classes conducted in Spanish) further contributed to lack of community engagement among limited-English-proficient women. In Texas, social isolation was often related to physical distance and lack of available transportation, a prevalent situation among homemakers who lived in more isolated *colonias* and had limited access to transportation. At both sites there were reports of women feeling isolated and having limited opportunities for regular social contact outside the home or workplace. Women whose husbands' employment required travel or extended periods away from home experienced further social constraints on their ability to leave their homes.

Concerns associated with both the physical and social environment further contributed to women's sense of social isolation and to generalized feelings of not feeling safe or welcomed in certain spaces. In the Texas border towns of San Juan and Alamo, residents and community representatives identified a number of safety concerns and physical conditions and environments that created barriers to LTPA, such as walking. These included physical and operational barriers, such as the location of facilities (e.g., schools, parks, community centers) and the restricted access to tracks or walking paths due to limited or inconvenient operating hours (e.g., closed early in the morning when summer heat is less intense). Feeling unsafe in their own neighborhoods was associated with the presence of stray animals and individuals or groups who engendered fear (e.g., gang members), combined with an unwelcoming and unsafe physical environment (e.g., insufficient lighting, lack of sidewalks, excess motor vehicle traffic and speeding drivers). In both sites, undocumented immigration status was a major concern and constraint to venturing into more public spaces or participating in activities outside the home.

Economic Constraints

Economic factors surfaced in relation to access and availability of specific PA resources and activities and constituted an underlying constraint in women's daily lives. A specific example of an economic barrier was the cost of a gym membership. Some women tended to connect LTPA with settings or activities they associated with higher economic status (e.g., private gyms, swimming pools, resorts). Due to their limited economic means and home and work constraints, many participants considered such activities beyond their means. The more pervasive, underlying constraints of poverty were woven through many participants' responses. For women living in more rural or outlying areas, and

those who did not have a car or did not drive, the lack of transportation was both an economic and a social barrier, because they depended on someone else to be available and willing to provide transportation. The broader economic downturn was reflected in women's narratives of their family economic problems and constraints resulting from recent job losses and the rising cost of food and other basic services.

Leisure-Time Physical Activity: Low Levels of Personal Knowledge, Skills, and Motivation

Some women reported having participated in some type of LTPA, either alone or in conjunction with some type of program (e.g., participating in a sport; walking; going to a gym). However, for the vast majority, exposure to PA was primarily related to housework or employment and they reported little to no prior experience in LTPA. Recent immigrants identified how migration had impacted their level of regular walking. Immigrant women reported that before coming to the US they regularly walked as part of their daily activities (e.g., going to market, church, visiting family). In contrast, they rarely walked in conjunction with these activities in the US, due to the built environments in the communities where they resided. In Mexico it was more common to do daily food shopping at local bakeries and markets, but in the US women depended on transportation to do food shopping and therefore it was no longer a daily activity. Most women had little knowledge or exposure to walking primarily for exercise or to other types of LTPA. The lack of available culturally congruent LTPA role models, the prevalent attitude that work and family took precedence over personal health, and lack of personal experience and exposure contributed to feelings of low self-efficacy for personal LTPA. Yet at the same time, participants were generally amenable to the notion of being physically active as a positive contribution to overall health.

Barriers to Leisure-Time Physical Activity: The Confluence of Social, Cultural, Economic, and Environmental Factors

In both South Carolina and Texas, Latina participants identified significant social, cultural, economic, and environmental factors contributing to low levels of LTPA (see Figure 2). For example, it was clear that women with limited English proficiency would not be willing to venture into an aerobics class taught in English, even if they had the time in their schedule and available and affordable childcare, were able to pay the gym fee, had transportation to the facility, and their family and friends were supportive of them participating in this type of activity. Furthermore, there were environmental and operational barriers to participating in low-cost activities such as walking (e.g., location and hours of operation; safety concerns). The lack of role models and low levels of personal knowledge and skills further contributed to the multiple layers of barriers to regular LTPA among Mexican-origin women in these communities.

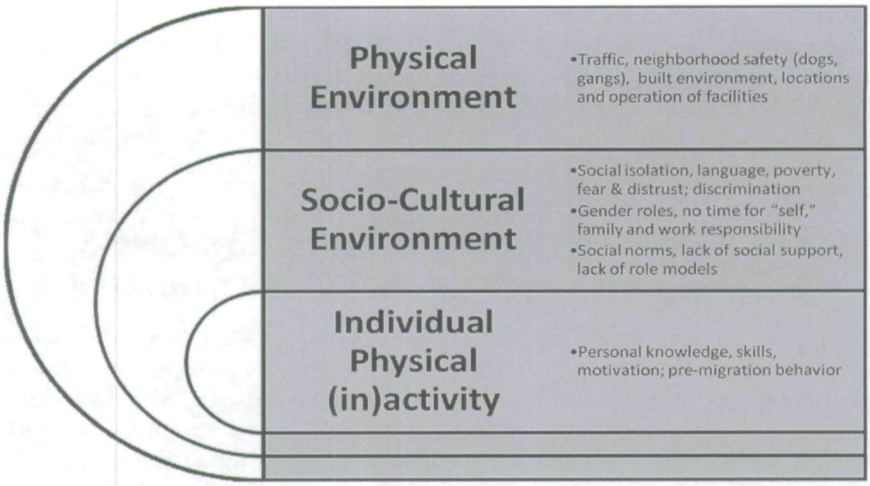

Figure 2 — Factors influencing individual physical activity among Mexican origin women.

Conclusions and Discussion

Well-developed formative assessment is an essential element of intervention planning because it helps researchers to recognize and understand the multiple and complex sociocultural and contextual issues that influence PA. Using a community-based participatory research approach, we engaged community stakeholders and in the process, contributed to increased community capacity and support for long-term program implementation.

The findings from these formative assessments were based on extensive community involvement and input and provided specific guidance for the development of a LTPA intervention that was subsequently implemented and evaluated at each site. We chose a *promotora*-led delivery model for the program, to enhance cultural receptivity and improve reach and retention. *Promotoras* are trusted community members that are similar to the target audience. They can communicate health information in culturally and linguistically appropriate ways and attend to language and literacy needs (e.g., limited English proficiency, low educational levels). They also serve as role models and a source of social support.

Offering the *promotora*-led LTPA program at a convenient location and time was another important consideration. The program sites were selected with input from the PAT after considering the results of the formative assessments. In Texas, where most participants were full-time homemakers, the best time of day for women to gather was in the morning immediately following the morning school drop off. The program was offered at existing Community Resource Centers that serve as a gathering place for community residents and information resource center where residents exchange information, interact with service providers (e.g., WIC, County clerk, Planned Parenthood) and participate in targeted programs (e.g., youth summer camps, health education programs). The Community Resource Centers were considered safe and neutral learning environments, with sufficient educational

space and outdoor recreation facilities, including adjacent walking paths. In South Carolina, Hispanic-serving churches were identified as safe and trusted settings for the pilot intervention. Given the high workforce participation among Latinas in South Carolina, the preferred meeting times were evenings and weekends. The church sites were also located within the targeted communities to minimize access and transportation barriers.

The formative assessments also guided the selection of culturally appropriate physical activities for a community-based program. Among the focus group participants there were indications that many did not perceive commercial "gyms" as an appropriate or welcoming option for LTPA, either because of cost or because they did not like being active in places where they would be exposed to public scrutiny. The participants, most of whom were low-income women of Mexican origin, also voiced their preference for Spanish-language and women-only groups. Such groups addressed their needs for personal modesty and averted potential spousal jealousy and also increased opportunities for enhanced social interaction and social support. Women identified walking and dance as appropriate forms of activity that they were confident they could do. There were also indications that behavioral skills such as time management and problem solving regarding how to incorporate "taking care of oneself" by participating in PA and balancing this additional activity with ongoing family responsibilities would need to be addressed.

Another important element in program development was building on the assets and resources that already existed in the community and connecting women to them rather than developing new initiatives that could not be sustained when the program ended. Strategies identified included volunteer led walking groups and building the capacity of *promotoras* for physical activity promotion and behavioral skill management. Offering low or no cost activities that can be done with little training in a woman's own home was also important (i.e., resistance bands, stretching, and exercise DVDs). Effective resolution of some of the issues participants identified (e.g., environmental safety and security, perceived racism and discrimination related to immigration status) was of course beyond the scope of this pilot project. However, the impact of these broader social and environmental factors cannot be discounted.

As the findings from this formative research indicate, interventions to promote PA among Mexican origin women must address multiple levels of influence: individual, sociocultural and the physical environment. Social, cultural, economic, and environmental factors may contribute to Latinas' readiness, willingness, and ability to participate in regular LTPA. In designing programs and strategies to increase LTPA levels among Latinas, it is necessary to assess the impact of community context, including geographic configurations and the physical and social environment; the availability and accessibility of individual and community PA-related resources; and social and cultural norms and expectations related to women's roles, work, and activities. If Mexican-origin women in diverse geographic and social contexts are to be more actively engaged in regular LTPA, culturally and linguistically appropriate, low-cost, convenient LTPA options offered in safe, accessible and supportive environments must be more readily available and accessible.

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