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## **Cultural Relevance of the Transtheoretical Model in Activity Promotion: Mexican-American Women's use of the Process of Change**

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### **ABSTRACT**

Hispanic women in the U.S. have disproportionately high rates of obesity and health disparities related to insufficient physical activity (PA). While the Transtheoretical Model (TTM) is one of the most commonly used behavioral theories in interventions promoting PA, there is a lack of evidence to support the cultural relevance of theoretical constructs for increasing PA in Hispanic women. To learn about Hispanic women's use and interpretation of the construct Processes of Change (POC) for increasing PA, we conducted focus groups with overweight/obese Mexican/Mexican-American females (N=13) ages 27-40 years. Major themes centered on the importance of children and family caretaking, social support, and PA to promote weight loss. Participants identified strategies they use to enact the POC for increasing PA such as *retos* (challenges), exercise as an alternative to eating, and clothing as a reward/reminder for PA. This study examined culture-specific factors used by Mexican-American women for becoming more physically active as they correspond to the theoretical constructs of the TTM. We showed that the POC examined in our study are culturally relevant and enacted by Mexican-American women for increasing PA, and are poised to be deployed in culturally appropriate PA promotion and weight loss interventions.

**Keywords:** Mexican Americans, behavioral intervention, community-based

### **INTRODUCTION**

Despite the benefits of regular physical activity (PA) for helping to maintain a healthy weight and reducing the risk of chronic diseases (Centers for Disease Control and Prevention, 2011), Hispanic women remain one of the least physically active populations in the U.S., with only 38.2% meeting the federal recommendations for performance of aerobic PA (Blackwell, Lucas, & Clarke, 2014). This indicates an urgent need for culturally appropriate PA interventions.

The use of behavioral theory in interventions promoting PA is essential for reducing health disparities in Hispanic women. Among studies promoting PA in Hispanic populations, approximately 43-75% reported the use of a behavioral theory or theoretical framework to guide their interventions (Ickes & Sharma, 2012; Mier, Ory, & Medina, 2010; Perez, Fleury, & Keller, 2010). The utility of theory is central to understanding the mechanisms that underpin health behavior and the processes involved in behavioral change as well as providing a framework to guide the development and evaluation of appropriate interventions (Rimer & Glanz, 2005). Further, the use of theory in behavioral interventions is critical to distinguishing essential from non-essential components of an intervention (Sidani & Braden, 2011), and preventing undue expense, loss of time, and inconvenience to participants in research.

One of the most commonly used theoretical frameworks in PA research in Hispanic and non-Hispanic populations is the Transtheoretical Model of Change (TTM) (Prochaska & DiClemente, 1983). The TTM is a comprehensive model that views behavior change as a process, rather than a single event, in which individuals move through a series of five stages in order to bring about the desired behavior change. The five stages of change (Precontemplative, Contemplative, Preparation, Action, and Maintenance) indicate *when* an individual is ready to make a change in behavior. The Processes of Change (POC) are covert and overt activities that individuals use to progress throughout the stages of change (SOC) (Prochaska, Velicer, DiClemente, & Fava, 1988) and are often used in behavioral interventions as independent variables to help move individuals from one stage of change to another (Prochaska & Velicer, 1997). There are 10 POC: consciousness raising, dramatic relief, self-reevaluation, environmental reevaluation, self-liberation, social liberation, counterconditioning, stimulus control, contingency management, and helping relationships (Prochaska & DiClemente, 1982; Prochaska & DiClemente, 1983). The construct Decisional Balance refers to the pros and cons of changing a behavior. Self-Efficacy, an individual's belief in their ability to successfully complete a task (Bandura, 1986, 1997), was later added as a construct of the TTM (Prochaska & Velicer, 1997). The TTM posits that these three constructs (POC, Decisional Balance, Self-Efficacy) are used to help individuals to make desired behavior changes and progress through the SOC (Prochaska & Velicer, 1997).

The TTM provides an appropriate theoretical model for developing and implementing PA promotion interventions as it recognizes individuals' readiness for making a change in their behavior and provides a framework for developing and implementing intervention messages/activities that can be tailored to the individual's SOC, or readiness, for becoming more physically active. The TTM, while originally developed for use in smoking cessation behaviors (Prochaska & DiClemente, 1982), has often been used to study PA in various populations, including mothers (Fahrenwald et al. 2004) and individuals who are Hispanic (Albright et al., 2005; Hayashi, Farrell, Chaput, Rocha, & Hernandez, 2010; Mier et al., 2011; Pekmezi et al., 2009; Yan, Wilber, Aguirre, & Trejo, 2009). Despite the broad use of the TTM in PA research, only a few studies reported the use of culturally and linguistically adapted TTM-based interventions to promote PA in Mexican-American women.

To address this gap in literature, we conducted focus groups with Mexican-American women between the ages of 27-40 years. The purpose of the focus groups study was to learn about the POC that are used and interpreted as salient to young Mexican-American mothers for promoting PA. Focus group questions were developed based on the TTM POC. The study focused on PA in Mexican-American women of childbearing age because certain life events (e.g., growing a family) that typically occur during this stage in the life course are associated

with decreasing PA (Brown, Heesch, & Miller, 2009), thus providing an ideal opportunity for health promotion interventions.

## **METHODS**

### Study Design

This focus group study was conducted with Mexican-American women (N= 13) ages 27-40 years, residing in the Phoenix, Arizona metropolitan area. We conducted a total of 5 focus group sessions with 2-3 participants each. The focus group study was designed to elicit information about the TTM and was specifically intended to learn about how Mexican-American women use the theoretical construct POC for becoming more physically active.

### Participants

Participants (N=13) were recruited from the *Madres para la Salud* [Mothers for Health] (Keller et al., 2014a ) study participant pool and those serving as *promotoras* (trained lay health workers) in the study. The study participants had provided consent to be re-contacted for future studies. We additionally used snowball recruitment strategies that included referred friends and family of Madres participants who were low-income Mexican-American women living in Phoenix that met study inclusion criteria of: a) ages 22-44 years, and b) BMI between 25 and 40 kg/m<sup>2</sup>. We selected a broad age range (22-44 yrs) of childbearing women, not only to include Madres participants, but due to recent trends in increasing age of motherhood and starting a family among Latinas in the U.S. (Mathews & Hamilton, 2016). While Latinas may start childbearing early in life, it is not uncommon to continue childbirth into the later end of this age range. Our study targeted sedentary women; thus, the focus was to learn how they could increase their PA to meet the national guidelines recommended for all healthy adults ages 18-65. In addition to examining PA behaviors in Mexican-American women, our focus group study explored dietary practices relating to consumption of added sugars (Benitez, Keller, Coe & Tasevska, In Press), therefore exclusion criteria for the study included: a) presently taking medication or being diagnosed with a syndrome or disease that could influence diet, or b) being enrolled in any weight management program during the past 3 months. The study was approved by the Institutional Review Board of Arizona State University.

### Procedures

A bilingual and bicultural (English/Spanish) research staff member contacted participants and *promotoras* from the *Madres para la Salud* study via telephone to assess their potential interest in participating in the focus group study. At this time, a thorough explanation of the focus group study was provided and interested participants completed a screening interview administered by the research staff member to assess eligibility. Eligible and interested participants were then scheduled to attend one focus group visit. Each participant attended one focus group visit that lasted approximately 2.5 hours. At the focus group visit, a trained bilingual/bicultural interviewer conducted the informed consent process, administered a demographic questionnaire and facilitated the focus group discussion. A bilingual/bicultural note taker was present at the study visits to record social exchanges and interactions that could provide additional context during data analysis. Participants were scheduled to attend the group that best corresponded their language preference and time availability. Four of the five focus group sessions were conducted in Spanish and one in English. Focus group visits were audio-recorded, transcribed, translated (from Spanish to English), and checked for accuracy. Bilingual/bicultural female research staff members were present at all focus group sessions and free childcare was provided by staff members.

Measures and Focus Group Questions

*Baseline demographic questionnaire.* The baseline demographic questionnaire, offered in both English and Spanish languages, included questions on income, ethnicity, education, marital status, employment and children/household composition. The questionnaire was interviewer-administered to allow for potentially low literacy levels among participants.

*Focus group script.* The development of the focus group script was guided by the theoretical construct POC from the TTM in order to learn about how the women use the POC within the cultural context of young Mexican- American mothers for becoming more physically active. Questions on the focus group script targeted primarily the behavioral POC used in mid-later SOC in the TTM, as opposed to POC used in early (precontemplative) SOC (Prochaska & DiClemente, 1983). The questions and prompts used by the facilitators to guide the focus group discussion elicited information from participants about how they have used, or attempted to use, each of the selected POC and how this worked for helping them to increase their PA levels. Table 1 provides examples of questions and prompts used in the focus group sessions as they correspond to each POC.

**Table 1**

*Focus group questions by Processes of Change.*

<b>Process of Change</b>	<b>Focus Group Questions</b>
Environmental reevaluation	For some women, being a better role model or influence to their children, partners, or even their friends to be healthier has motivated them to become more active. Tell me about any times that you thought about how your physical activity could affect others.
Counterconditioning	Some women do physical activity to feel better when they are tired or to relieve tension when they are feeling stressed. Have you tried to do physical activity to feel better? If so, tell me about how you feel it worked.
Helping relationships	<p>Other women have tried getting a friend, partner or spouse, or even children to exercise or walk with them. If you have, tell me about how you did that and how you feel it worked.</p> <p>Tell me about friends, family, or co-workers (or anyone else) who have encouraged you to do exercise when you don't feel up to it</p>
Reinforcement management Reminding oneself	<p>Some women use deliberate strategies to help them increase exercise or become more physically active, such as giving themselves <i>rewards</i> or placing <i>reminders</i> to exercise around the home or their place of work. If you have tried that, tell me about it and how you feel it worked.</p> <ul style="list-style-type: none"> <li>▪ Prompt for reinforcement management: Tell me about times that you have done something nice for yourself or rewarded yourself for being physically active.</li> <li>▪ Prompt for reminding oneself: What reminders or cues have they added to help them be more physically active or what reminders have they removed that prevented them from being active?</li> </ul>

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Self-liberation	<p>Some women have made commitments based on what they believe about their health, for example, if their health declines due to being overweight or not getting physical activity, they may not be able to care for their family. Have you tried this to change your activity, or increase your walking commitment? If so, tell me about how you did this.</p> <p>Tell me about any commitments you made to change your activity, such as telling yourself that you could be more active if you wanted to or if you try hard enough.</p> <ul style="list-style-type: none"><li>▪ Prompt: Commitments can also be a New Year's resolution, promise to another person, or any other event/tradition (weddings, <i>quinceañeras</i>, lent) that prompted you to make a commitment to become more active. Tell me about these and how you feel they worked.</li></ul>
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### Data Analysis

Audio-recorded focus group sessions were transcribed, translated and checked for accuracy by a bilingual/bicultural translator. The focus group transcripts were then independently read and coded by three members of the research team to identify key words and phrases. Common threads in data were identified by each researcher independently and then discussed in team meetings to corroborate findings. Once themes were fully developed, the researchers reached data saturation and data were then grouped into relevant themes and categorized into each POC. Our analysis of focus group data was guided by the analytic procedures for qualitative data as described in Marshall and Rossman (2011). To check for accuracy of translation and ensure that content was not lost in translation, a bilingual/bicultural researcher read and coded the Spanish language transcripts (prior to translation) and corroborated themes identified by researchers coding the translated (Spanish to English) transcripts.

To establish trustworthiness and credibility of our findings, we used a number of strategies commonly used in qualitative research. First, we triangulated data by comparing our findings to evidence from other sources (i.e., peer reviewed published research), as described in Table 2. We also used external auditing, in which an outside individual reviewed research procedures and interpretations of the data (Creswell & Miller, 2000). Lastly, we included the use of thick, rich descriptions illustrating participants' experiences in enacting the Processes of Change for increasing their PA.

## **RESULTS**

### Participants

Participants (N=13) were self-reported Mexican/Mexican-American females (100%) between the ages of 27-40 years (mean= 35.31, SD= 4.04) who were overweight or obese (mean BMI= 29.67, SD= 3.07). Participants reported their highest level of education as less than high school (n=5, 38.5%), high school graduate (n=3, 23.1%), or some college or bachelor's degree (n=5, 38.5%). Most of the women were married (n=8, 61.5%), three (23.1%) were single- never married, one was divorced and one was living with a partner. They nearly all had children (n=12, 92.3%). Eleven (84.6%) of the women reported living in households consisting of four or more adults and children, with most (n=9, 69.2%) having yearly household incomes under \$30,000. Participants reported living in the U.S. between 8-40 years (mean= 17.08, SD= 8.68). The majority of women indicated a language preference for Spanish at home (n=11, 84.6%), while one reported English and one "Spanglish" as their preferred language at home.

### Themes

The focus group questions elicited information from participants about the relevance of the POC within the cultural context of young Mexican- American mothers for promoting PA and facilitating movement throughout the earlier SOC (i.e., contemplative, preparation and action stages). Specific themes were coded that included leverage strategies that specified how young Mexican-American women deployed the POC. Focus group themes are described below as they pertain to specific POC.

*Environmental reevaluation.* Environmental reevaluation refers to thinking about the impact that a behavior has on the person's social environment and how the presence or absence of a specific behavior affects others (Prochaska & Velicer, 1997; Prochaska et al., 1988). All of the Mexican-American women in our focus groups spoke about the consequences of their physical activity or inactivity primarily in the context of their children and family members. The most prevalent themes that emerged were 1) being a good role model for their children and



family members, and 2) fear of being unable to care for family members due to illness or poor health. Participants, who understood the value of PA, discussed the importance of being a good role model for PA and spoke about how children motivate them to be more active, “because your kids look up to you” and “I neglected myself for thinking about others, and what better way than me being their example, to take care of myself.”

Participants expressed that another strong motivator for PA was the fear of becoming ill and unable to care for their families or becoming a burden to their families. This was exemplified by statements such as: “My motivation are my children and I say, if I don’t eat well, if I do not exercise, after a while I’ll get sick, and my girls have only me ... I always think about it, if I do not take care of my health, if I do not care about this, if I do not care about that, and fall ill, who will have them [care for them]”; “I do not want to get sick, I do not want to fall, because I am all the girls have, I can’t afford to fall. I have to be active, thus, and I go back to the same, the commitment is with my girls.” Participants also spoke about negative effects of stress on caring for family. PA was beneficial in helping to reduce stress and related emotions, thus helping them be a better parent.

*Self-liberation.* Self-liberation requires both a belief that one can change a behavior as well as a commitment to making the desired change, such as New Year’s resolutions or public testimonies (Prochaska & Velicer, 1997; Prochaska et al., 1988). Participants spoke about commitments they had made for becoming more physically active; these often involved commitments to themselves (e.g., “if you tell yourself in the morning, I can do it, I can do it. You can do it”) and self-realizations to improve their health by increasing PA. The commitments and self-realizations for PA are exemplified in the following statements: “... sometimes one doesn’t have someone to motivate you ... here one doesn’t have family but one does know that it is for your own health so one has to battle” and:

Then I say, “Now I prefer to be impoverished or may not have a car, maybe a pretty car, but I am going to take care of myself because this is the only car I have, my body.” I say “why I have not taken care of my body if this is my home, where I am going to live, why I haven’t taken care of myself?” “And I don’t... I neglected myself for thinking about others”.

For several participants, commitment to increase PA was prompted by a specific event. One woman discussed the desire to adhere to a walking routine after seeing old pictures of herself: “I noticed myself in the pictures that are taken or I noticed [weight gain] in my clothes and I say, no, I want to *meterle ganas* (put all your heart into it)” while two others spoke of the awakening created by approaching their 40<sup>th</sup> birthday: “It is going to be my 40<sup>th</sup> birthday, so I set a challenge to myself, ‘I don’t want to be overweight when I reach 40. I want to lose [weight]!’” Another participant expressed that her commitment to take care of herself was driven by her fear of becoming ill and a burden to her children:

“Because you say, if I chose to eat right now or then, in a few years, I will be diabetic and then my kids will have to deal with my illness. So then, yes, like yes, I make myself conscious of that. I became orphaned [when] my mom died at forty year old of cancer but she was too fat.”

*Counterconditioning.* Counterconditioning involves substituting or replacing an unhealthy behavior with a healthier one (e.g., using relaxation to counter stress) (Prochaska & Velicer, 1997; Prochaska et al., 1988). Major counterconditioning themes that participants spoke about included: 1) strategies for doing exercise as an alternative to eating and to counter fatigue, and 2) alternatives for PA when there are neighborhood safety concerns. Participants expressed



that “if I am not exercising, I am at home fatigued, I sit on the couch, I’ll sit somewhere else and all I do is go to the kitchen and eat” and some placed reminders in their homes that would help them replace eating with PA, “I put [the gym schedule] on the refrigerator, so then, there are times, I have anxiety to eat and I go to the refrigerator and I want to open it to make me a sandwich or something and I see the thing and I say what time is it? There I look and I say there is going to be a class.” Many of the participants spoke about using PA to replace eating in the context of motherhood- specifically, to lose the weight gained following the birth of the child/children as exemplified in the following statement:

“Since I gave birth to my daughter I breastfed and the doctor would tell me you are going to lose weight, but no, I would get fatter. I started trying to be somewhere where I could not be home eating. So then, what I did was that I joined the gym where they would watch her [my daughter].”

*Stimulus control.* The process of stimulus control involves removing cues to unhealthy behaviors and adding reminders or prompts that encourage healthier ones (Prochaska & Velicer, 1997; Prochaska et al., 1988). Commonly used stimulus control strategies that participants spoke about to encourage them to be physically active included physical reminders placed in their homes such as hanging the gym schedule on the refrigerator (as mentioned in Counterconditioning) or using clothing as a reminder for PA. For instance, participants spoke about buying clothing in smaller sizes or keeping their old clothes that no longer fit them as reminders to be physically active and lose weight:

“And one has to have it in front to be looking at it to stay motivated. For me, in my case, what I do is that I do not buy myself clothes. I do not go and buy myself a pair of size 12 jeans or larger. I have bought myself size 11 but that is it, I have four [pairs]. Because I know that if that is the way I look good, I feel good, and I feel healthy. So right now I am size eleven. So then, that is what motivates me to see the pants and I tell myself I am not going to buy clothes until I lose weight.

Another participant described making a collage that provided a detailed list of her goals. She hung this collage on her bathroom door and looked at every morning as a reminder to be physically active:

“I grab a large cardboard, I grab some magazines and cut what I want, for example, I want these clothes and shoes, so I put it, I want to be thin, I put a thin cute blonde...”

Participants spoke about trying to avoid behaviors, such as excessive television watching, that both involve and encourage inactivity. For example, “you start a program and you would sit there for hours, you can take up the entire day watching television if you get hooked on the program”; others spoke specifically about the Spanish language soap operas:

“What I did was I no longer watch soap operas at night, I cannot watch soap operas at night, and in the morning there are two or three soap operas in the channels, so because I was watching the *bendita novela* (sarcastic reference meaning “blessed soap opera”), I didn’t sleep, so I said, no, the television needs to be turned off.”

*Helping relationships.* Helping relationships refers to the caring, trusting and supportive relationships that promote a healthy behavior change (Prochaska & Velicer, 1997; Prochaska et al., 1988), such as having social support from friends or family that encourage PA. Participants spoke of having a female friend who was a strong motivator of PA; they often described these friends as someone who is persistent- “she always calls, she reminds me we have to go to the gym. She’s the one that made me join [the gym],” and does not make excuses- “I have a friend with whom I get together a lot and she is the one who says to me, ‘we already have membership,

and paid, we have to go because if not, we paid for nothing” or “she goes, ‘no, you can do it [stairclimbing at work] she’s like,’ just don’t talk [when out of breath], just keep going...’ she’s like, ‘no, you don’t have no excuse, come on, let’s just go’.”

Participants expressed that their children were a great source of social support for PA: “I have my daughter, she is the one who helps me: ‘Ma, this is wrong, we should not eat this’ or ‘let’s go now, we have to go to exercise;’ and we go to the gym in the mornings... so she is my motivation” and described their children’s persistence as one of their greatest motivators for PA: “she [10 year-old daughter] is like a broken record because she reminds me all the time” and “my reminder are my girls, ‘Mommy, you promised me.’ Making promises and keeping them, because if you promise something and you don’t do it, they won’t believe you... My daughters are everything to me.” In addition to social support from friends and children, many of the women expressed a desire for their husbands or partners to walk with them, “I wish my husband would go. That would be so nice...” but spoke about their lack of motivation for walking together, “he goes ‘why, I walk all day long’ cause he does um landscaping, but I go, it’s not the same” to which another participant added: “I know, that’s what my husband says too.”

A common strategy that participants spoke about to encourage PA with friends and family was the use of *retos* (challenges), both self-challenges and competitive challenges between their friends and family. These challenges included PA, often as a means of losing weight and are exemplified in the following statement:

“A while back I had some friends that would come to my house, and then we set a challenge to weigh and measure ourselves. So, then, we would share it every week or every month and we would weigh ourselves, write it down, and measure ourselves. It became a challenge to us and we lost about two inches in the waist, and we lost a few and one of them even lost 10 pounds. There at my house, I would try to have the bike, I had a climber, I had a trampoline and I had one of those [machines] to do crunches. And we would talk and drink some tea or something healthy, and we would exercise or just talk.

This participant concluded her comments by suggesting that if groups of women got together, made commitment to lose weight, and recorded their weight on a regular basis, they could turn weight loss into a social and fun source of motivation. Another participant described using challenges with her husband to help him lose weight. She stated that this challenge resulted in her becoming more physically active because she had someone to go for walks with every day:

“Because we are going to celebrate my daughter’s *quinceañera* [a traditional 15<sup>th</sup> birthday celebration for girls], I said, ‘I want you to go down to this size’...’because we want to dress you as a cowboy, so, we want you to come down to this size’... Even though at night it is cold, we always go out to walk.”

While participants discussed the role of friends and family for becoming more physically active, a common theme that emerged in our focus groups was the loss of social support for PA that occurred when a friend or family member stopped exercising with them. For example, one participant spoke about losing motivation for PA when her friend became pregnant and stopped exercising with her, “... but now she’s pregnant, too, so I do not have the motivation to go alone to the gym.”

*Contingency management.* Contingency management provides consequences for actions, such as rewards or punishments, taken towards making a behavioral change (Prochaska & Velicer, 1997; Prochaska et al., 1988). Participants spoke about the goals they used to increase PA, as well as the rewards and punishments that they used to help achieve their goals. Several women emphasized the importance of short-term goals that were realistic and attainable. They

expressed: “my goal is short-term, because, as she said, other things get in the way and we can’t do it” because “each one knows herself, and everyone knows where [their] limits are and how they can be reached, I set my goals.” These participants indicated that they had realized that long term goals are often forgotten, suggesting that making reachable goals is a better way to get oneself to lose weight.

Commonly used rewards to motivate PA were the use of clothing (e.g., buying a smaller size pair of pants) and feeling healthy. Participants often spoke about buying clothing or going to the store to try on smaller size clothing. They expressed that having smaller size clothing was a reminder to be physically active and was used as a reward for losing weight and achieving PA goals. One participant stated:

“If I did some things to reach my goal, for example- exercise, I buy [clothes], if I see a dress that I like, I buy the size that I know I will achieve...I have to fit in there, then I buy the dress and it is a motivation, I buy it before I do it...It encourage me to exercise, so that it will fit me.”

While many of the participants revealed that clothing and clothing size was a strong motivator of PA and weight loss, one participant expressed that as much as “it makes you feel good too, especially when you go to the store and you try on something...a dress or pants” she felt discouraged about the weight she had gained after having a baby, stating: “I don’t even really like going shopping right now because I put something on and I don’t like the way it looks on me... I would go to the mall, and I would try on dresses, and I would like the way that they would look on me or they fit me and now I don’t. I haven’t even gone shopping honestly.” Another participant agreed that she was “in the same boat.”

In addition to using clothing to feel good about themselves as a reward for PA, participants also emphasized that having good health was an important reward for being physically active. One participant stated that: “my reward is to feel good, just that” while another added: “the reward that I give myself is exercise. Because for me, I love, I love to dance” and spoke about health benefits such as improved sleep, “doing those twenty minutes [of exercise], believe me, I sleep tranquil.”

Several participants spoke about avoiding financial loss or punishment as a motivator of PA. For example, participants described the use of challenges to encourage them to become more physically active with friends and family. Some of these challenges involved financial consequences for not achieving the PA and/or weight loss goals. One participant stated: “I challenged her that we were going to wear size 6, for money, of course” and another explained that if she did not meet the weight loss goals in her “boot camp” challenge, she would have to pay approximately \$300; whereas if she met her goals, the program would be free of charge. Participants expressed that avoiding the expense for not meeting goals was a great motivator to increase PA.

## DISCUSSION

While the TTM constructs were developed for use in extinguishing negative behaviors (i.e., smoking cessation), to our knowledge, this study is the first to examine the cultural specificity of using the POC to promote PA (i.e., adding a positive behavior) in an underserved population. Our study provides insight into the cultural and contextual factors that young Mexican American mothers use to increase PA and facilitate movement through the TTM’s

SOC. Findings from our study suggest that the POC are culturally relevant to the lives of Mexican American women, when based on their culture and traditions, and are used by young Mexican American mothers for increasing PA. The majority of the focus group discussions revolved around interpersonal relationships, primarily focused on family and close friends. In much of the extant research on Mexican-American women, the support of family and friends has a critical bearing on the initiation and maintenance of PA (Gonzales & Keller, 2004; Keller et al., 2014a; Keller & Cantu, 2008; Lindberg & Stevens, 2011). Social support for women in this study served to motivate them through walking with spouses, children and friends. These helping relationships were often 'hidden motivators' as well as deliberately selected sources for motivating the women to be more active.

The POC environmental re-evaluation was a significant theme in this study, and appears congruent in the extant research. Participants in our study spoke about the consequences of PA in the context of having good health so that they would be able to care for their family members; they emphasized the importance of being a healthy role model for their children. The expression of fear of becoming ill and unable to care for their families was one of their strongest motivators of PA, these findings are consistent with previous research in Mexican-American women (Fleury et al., 2009; Jay et al., 2014).

Similar to previous research with Mexican-American women, participants in our study expressed a desire to lose weight and to look good for their spouses or partners (Gonzales & Keller, 2004; Keller et al., 2014b). Several participants spoke about the emotional consequences of weight gain during and after pregnancy, such as feeling dissatisfied with their appearance; these consequences were comparable to a woman's statement: "I gained weight and that made me feel more depressed" in Himmelgreen et al.'s study with Latinos (Himmelgreen, Daza, Cooper, & Martinez, 2007). Given the increased risk of weight gain during certain life stages (i.e. starting a family) (Brown et al., 2009) and health risks of obesity, understanding the emotional consequences of overweight/obesity is important as Hispanic women have reported that being self-consciousness about their appearance is one of their greatest barriers to PA, the second greatest barrier to PA after caregiving responsibilities (King et al., 2000).

While a number of new strategies emerged in our study which contributes to enhancement of cultural relevance and specificity in PA literature with Hispanic women, many of the findings were consistent with previous research. Table 2 further illustrates congruency between findings from our focus group study and extant research for each of the POC examined in the current study. Consistency between our findings and extant research suggests that the POC are culturally relevant in participants' definition and interpretation of them. In other words, young Mexican-American women mothers are using the POC to become more physically active; thus, the strategies that emerged in our study are poised to be deployed in PA interventions to promote PA with this population.

**Table 2**

*Congruency between focus group findings and extant research for selected Processes of Change (POC).*

<b>POC</b>	<b>Relevant Research</b>	<b>Relevant Findings Congruent with Extant Research</b>
Environmental Reevaluation	<p>Consequences of PA to family:</p> <ul style="list-style-type: none"> <li>▪ Latinas have reported the need/feeling obligated to stay healthy to care for their children, families (Fleury, Keller, &amp; Perez, 2009; Jay et al., 2014) and others who depended on them (Jay et al., 2014).</li> <li>▪ Desire to be healthy role models for their children and families (Keller, Coe, &amp; Moore, 2014)</li> <li>▪ Importance of family- family comes first, before woman's own needs (D'Alonzo, 2012; Evenson, Sarmiento, Macon, Tawney, &amp; Ammerman, 2002; Gonzales &amp; Keller, 2004)</li> </ul>	<p>Fear of illness and inability to care for children motivates PA</p> <p>Be a healthy role model to children and family, "teach by example"</p> <p>PA as a means of stress reduction can improve parenting abilities and promote harmony in the home.</p>
Self-liberation	<p>Commitments to themselves and others:</p> <ul style="list-style-type: none"> <li>▪ Participants in Jay (2014) spoke about commitments to children- "It's an obligation" and reminding them to stick to their commitments and goals.</li> <li>▪ Personal motivation and willpower (Jay et al., 2014)</li> <li>▪ One study used commitment forms to formalize obligation to study. Participants reported a sense of commitment to themselves and to others in the study (Ingram, Ruiz, Mayorga, &amp; Rosales, 2009).</li> </ul>	<p>Making and keeping promises with their children</p> <p>"what better way than me being their example, to take care of myself"</p> <p>Commitments often driven by the women increasing their own self-efficacy for PA/attempts to increase SE: "telling myself, you can do, I can do it!"</p>
Counterconditioning	<p>In PA literature, Latina participants have reported the use of PA strategies similar to those in our focus groups; however, the motivation for such</p>	<p>Participants listed places where they go or PA activities they can do (e.g., dancing video games with children, going to the park with children)</p>

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	<p>activities (whether these activities were intended to avoid or replace other unhealthy behaviors) was not specified. For example:</p> <ul style="list-style-type: none"> <li>▪ Latinas engage in household and caregiving activities (Chasan-Taber et al., 2007) but not specified if it is done in place of other activities or as a source of PA</li> <li>▪ A community-based study (Chasan-Taber et al., 2010) in Texas promoted stair use in largely Hispanic community locations (that had elevators and/or escalators) using culturally appropriate signs in English and Spanish that depicted the importance of family and health.</li> </ul> <p>Neighborhood safety concerns, lack of safe places to exercise common barrier to PA among Latinas (Eyler et al., 1998; Juarbe, Turok, &amp; Pérez-Stable, 2002; Martinez, Arredondo, Perez, &amp; Baquero, 2009)</p>	<ul style="list-style-type: none"> <li>▪ PA in place of sitting on the couch or eating (e.g., going to the gym instead of eating, “I started trying to be somewhere where I could not be home eating”)</li> <li>▪ One participant spoke about being encouraged by a friend to use the stairs at work for PA</li> <li>▪ Indoor PA as an alternative for unsafe neighborhood: “bought a trampoline for little ones and I do all my exercises there...” including household chores such as “mopping very fast”</li> </ul>
Stimulus Control	<p>Adding prompt to PA and removing cues for sedentary behaviors driven by:</p> <ul style="list-style-type: none"> <li>▪ Desire to change their body weight to look good for their partner or spouses (Gonzales &amp; Keller, 2004; Keller et al., 2014b)</li> <li>▪ Lack of time (Evenson et al., 2002; Juarbe et al., 2002; Martinez et al., 2009; Mier, Medina, &amp; Ory, 2007; Ramirez, Chalela, Gallion, &amp; Velez, 2007) and need for time management strategies (Keller et al., 2012).</li> </ul>	<p>Keeping smaller size clothing visible as a reminder- shopping for new smaller size clothing and keeping their own smaller size clothing visible.</p> <p>Creating physical reminders to encourage PA- cardboard collage with images of goals (e.g., clothes, shoes, body size ideals “I want to be thin, I put a cute blondie”)</p> <p>Time management- avoid excessive television</p>



	PA interventions with Latina mothers have incorporated time management strategies (Keller et al., 2014b).	watching, especially the “ <i>benditas novelas</i> .”
Helping Relationships	<p>Social support has been reported as one of the most common correlates of PA in Latinas (Keller &amp; Fleury, 2006; Marquez, McAuley, &amp; Overman, 2004).</p> <p>PA interventions with Latinas have included social support in their interventions (Benitez et al., 2015; Keller et al., 2014a; Pekmezi et al., 2009), and have used friend or family based approaches, such as mother/daughter interventions (Olvera et al., 2010) or weight loss partners selected from participants’ social networks (Marquez &amp; Wing, 2013)</p> <p>Decreased/loss of social support for PA over time:</p> <ul style="list-style-type: none"> <li>▪ Stopping PA when a friend became pregnant and could not go for walks together (Pyatak, Florindez, Peters, &amp; Weigensberg, 2014)</li> <li>▪ Initial increase in social support reported by Latinas in active phase of PA intervention was not sustained, and decreased, over time (Keller et al., 2014a)</li> </ul>	<p>Sources of social support for PA included:</p> <ul style="list-style-type: none"> <li>▪ Persistent friend who is encouraging, provides frequent PA reminders and does not make excuses for PA</li> <li>▪ Children as a great source of PA</li> <li>▪ Social support from husbands/spouses as both facilitator (e.g., walking together) and barrier for PA (e.g., does not want to walk with wife/partner after working all day or does not want her going to exercise at a gym)</li> </ul> <p>Strategies to promote PA:</p> <ul style="list-style-type: none"> <li>▪ Use of <i>retos</i> (challenges) to promote social support for PA and weight loss with friends and family</li> </ul> <p>Loss of social support that occurred when a friend or family member stopped exercising with them (moved away, became pregnant and stopped exercising), often resulting in participants’ loss of motivation to continue PA.</p>
Contingency Management	<p>Use of PA goals</p> <ul style="list-style-type: none"> <li>▪ Jay (2014)- participants wanted small and attainable goals for initiating behavior change</li> <li>▪ Intervention in Latino participants that included setting weekly short-term diet and PA goals in 20-week weight loss</li> </ul>	<p>Participants expressed preference for short-term PA goals as they are more achievable, as opposed to long-term which are often forgotten.</p> <p>Participants spoke more about use of rewards for motivating behavior change than punishments.</p> <ul style="list-style-type: none"> <li>▪ Smaller size clothing as a reward for</li> </ul>

	<p>intervention showed significant weight reduction (Corsino et al., 2012)</p> <p>Rewards for positive behaviors more useful in changing behavior than punishments (Prochaska, Velicer, DiClemente, &amp; Fava, 1988)</p> <p>Latinas report lack of energy and feeling stressed as barriers to PA (Evenson et al., 2002)</p> <p>Excessive weight gain in pregnancy and failure to lose weight after pregnancy are important predictors of higher sustained BMI/retaining weight years after pregnancy (Rooney &amp; Schauberger, 2002), emotional impact of pregnancy post-partum weight gain in Latinas</p> <ul style="list-style-type: none"> <li>▪ Himmelgreen (Himmelgreen, Daza, Cooper, &amp; Martinez, 2007) “I gained weight and that made me feel even more depressed”</li> <li>▪ King (King et al., 2000) self-consciousness about appearance was one of the top barriers to PA in Latinas, second to caregiving.</li> </ul>	<p>losing weight and achieving PA goals.</p> <ul style="list-style-type: none"> <li>▪ Having good health and sleeping well as rewards for PA: “my reward is to feel good, just that”, “doing those twenty minutes [of exercise], believe me I sleep tranquil”</li> <li>▪ Benefits of PA for helping to have more energy to care for family, to feel good, to reduce stress</li> </ul> <p>Rewards driven by desire to lose the weight gained in pregnancy and after childbirth. Several participants expressed discouragement from not losing weight.</p>
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Interventions to reduce obesity and PA-related health disparities in Hispanic women require an in-depth understanding of a range of cultural and linguistic factors that influence readiness to engage in PA. Hispanic women report common barriers to PA such as limited English language skills (Evenson, Sarmiento, Macon, Tawney, & Ammerman, 2002; Juarbe, Turok, & Pérez-Stable, 2002; Ramirez, Chalela, Gallion, & Velez, 2007), lack of time due to family responsibilities, lack of social support (Evenson et al., 2002; Juarbe et al., 2002; Martinez, Arredondo, Perez, & Baquero, 2009; Mier, Medina, & Ory, 2007; Ramirez et al., 2007), lack of safe places to exercise, fear of immigration authorities, and lack of transportation (Martinez et al., 2009). Many of the factors that put Hispanic women at increased risk for obesity and chronic diseases that are related to sedentary lifestyles have been shaped by deeply embedded cultural values and norms that can influence behavior. The importance Hispanic women place on caring for their children, grandchildren, spouses, and parents, while often seen by them as a sacred activity, is commonly identified in the health literature as a barrier to being physically active because caretaking responsibilities come first (Gonzales & Keller, 2004). A Hispanic woman's central role in caring for her family and devotion to their needs can be so strong that, despite knowing the health benefits of PA, caring for family will very often take precedence over being physically active (Gonzales & Keller, 2004; Martinez et al., 2009). We suggest that we switch our focus from demands of family and barriers to protective behaviors, to the view of this devotion as a powerful motivator to becoming physically active.

### **Limitations**

There were some limitations to our study. Our study was comprised of a small sample of Mexican-American young mothers residing in a Southwestern U.S. metropolitan area. This could limit the generalizability of findings as use of POC may vary in Hispanic women of different ages, life stages, and geographic locations. Moreover, our study was limited to participants who were not diagnosed with any syndrome or disease that would influence dietary practices. Given the rapid increase in diabetes and metabolic disorders in Latinos, further studies should include women with such medical conditions.

The small sample size of 2-3 participants in each group is a further limitation. While this limits the group dynamic, it allowed participants to provide richer detail on their experiences. Despite our best efforts to enroll participants in our study (i.e., frequent reminder calls prior to and day of visit, rescheduling missed visits, flexible hours for groups) and larger scheduled groups (4-6 per group scheduled), we had low attendance. The primary reasons for lack of attendance were reported as having a sick child, family problems, and work schedule conflicts. This issue is consistent with literature underrepresentation of racial and ethnic minorities in health research (George, Duran & Norris, 2014; Yancey, Ortega & Kumanyika 2006), and reinforces the need to further understand such factors. Despite these limitations, this study provides insight into the cultural relevance of the TTM and how this specific population uses the POC to advance through the model's SOC.

### **Strengths, Implications and Future Directions**

This focus group study examined the personal, environmental, and culture-specific factors used by Mexican-American mothers for becoming more physically active as they correspond to the theoretical constructs of one of the most widely used theoretical frameworks in PA research- the TTM. Understanding how this subgroup of Mexican-American mothers deploys the theoretical constructs (i.e., POC) of the TTM for becoming more physically active is

especially important in the development of interventions- not only for reducing the risk of obesity and PA-related illness in this underserved population, but to potentially improve the lives of future generations of Mexican-American mothers. Health practitioners can also help their patients to become more physically active by leveraging the POC. For example, they can teach young mothers to engage their children in regular PA (e.g., going for walks together, engaging in active play/games together) or teach to be a healthy role model. Mexican-American mothers have a central role in family and caretaking responsibilities; targeting this population is not only necessary for improving the health of young Mexican- American mothers, but may also impact the health of their children. While the TTM is one of the most widely used behavioral theories in PA research, little is known about the cultural relevance of the POC for promoting PA in young Mexican-American mothers. Results from the current study can be used to inform future TTM-based interventions to promote PA and reduce health disparities in this underserved population.

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### REFERENCES

- Albright, C. L., Pruitt, L., Castro, C., Gonzalez, A., Woo, S., & King, A. C. (2005). Modifying physical activity in a multiethnic sample of low-income women: one-year results from the IMPACT (Increasing Motivation for Physical ACTivity) project. *Annals of Behavioral Medicine, 30*(3), 191-200. doi: 10.1207/s15324796abm3003\_3
- Bandura, A. (1986). *Social foundations of thoughts and action: A social cognitive framework*. Englewood Cliffs, NJ: Prentice Hall.
- Bandura, A. (1997). *Self-Efficacy: The Exercise of Control*. New York: W.H. Freeman.
- Benitez, T. J., Cherrington, A. L., Joseph, R. P., Keller, C., Marcus, B., Meneses, K., . . . Pekmezi, D. (2015). Using Web-Based Technology to Promote Physical Activity in Latinas: Results of the Muevete Alabama Pilot Study. *Computers, Informatics, Nursing, 33*(7), 315-324. doi: 10.1097/cin.0000000000000162
- Benitez, T., Keller, C., Coe, K. & Tasevska, N. (In Press). Investigation of the cultural context of sugars consumption behavior in low-income Mexican-American women. *Journal of Health Disparities Research and Practice*.
- Blackwell, D. L., Lucas, J. W., & Clarke, T. C. (2014). Summary health statistics for US adults: national health interview survey, 2012. *Vital and health statistics. Series 10, Data from the National Health Survey, (260)*, 1-161.

- Brown, W. J., Heesch, K. C., & Miller, Y. D. (2009). Life events and changing physical activity patterns in women at different life stages. *Annals of Behavioral Medicine, 37*(3), 294-305. doi: 10.1007/s12160-009-9099-2
- Centers for Disease Control and Prevention. (2011). Physical Activity and Health. Retrieved from <http://www.cdc.gov/physicalactivity/everyone/health/>
- Chasan-Taber, L., Fortner, R. T., Gollenberg, A., Buonnaccorsi, J., Dole, N., & Markenson, G. (2010). A prospective cohort study of modifiable risk factors for gestational diabetes among Hispanic women: Design and baseline characteristics. *Journal of Women's Health, 19*(1), 117-124. doi: <http://dx.doi.org/10.1089/jwh.2009.1416>
- Chasan-Taber, L., Schmidt, M. D., Pekow, P., Sternfeld, B., Manson, J., & Markenson, G. (2007). Correlates of physical activity in pregnancy among Latino women. *Maternal and Child Health Journal, 11*(4), 353-363. doi: <http://dx.doi.org/10.1007/s10995-007-0201-8>
- Creswell, J. W., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory into practice, 39*(3), 124-130.
- Corsino, L., Rocha-Goldberg, M. P., Batch, B. C., Ortiz-Melo, D. I., Bosworth, H. B., & Svetkey, L. P. (2012). The Latino Health Project: pilot testing a culturally adapted behavioral weight loss intervention in obese and overweight Latino adults. *Ethnicity & Disease, 22*(1), 51-57.
- D'Alonzo, K. T. (2012). The influence of marianismo beliefs on physical activity of immigrant Latinas. *Journal of Transcultural Nursing, 23*(2), 124-133. doi: 10.1177/1043659611433872
- Evenson, K. R., Sarmiento, O. L., Macon, M. L., Tawney, K. W., & Ammerman, A. S. (2002). Environmental, policy, and cultural factors related to physical activity among Latina immigrants. *Women's Health, 36*(2), 43-57. doi: 10.1300/J013v36n02\_04
- Eyler, A. A., Baker, E., Cromer, L., King, A. C., Brownson, R. C., & Donatelle, R. J. (1998). Physical activity and minority women: a qualitative study. *Health Education & Behavior, 25*(5), 640-652.
- Fahrenwald, N. L., Atwood, J. R., Walker, S. N., Johnson, D. R., & Berg, K. (2004). A randomized pilot test of "Moms on the Move": a physical activity intervention for WIC mothers. *Annals of behavioral medicine, 27*(2), 82-90.
- Fleury, J., Keller, C., & Perez, A. (2009). Exploring resources for physical activity in Hispanic women, using photo elicitation. *Qualitative Health Research, 19*(5), 677-686. doi: 10.1177/1049732309334471
- George, S., Duran, N., & Norris, K. (2014). A systematic review of barriers and facilitators to minority research participation among African Americans, Latinos, Asian Americans, and Pacific Islanders. *American journal of public health, 104*(2), e16-e31.
- Gonzales, A., & Keller, C. (2004). Mi familia viene primero (My family comes first): Physical activity issues in older Mexican American women. *Southern Online Journal of Nursing Research, 5*(4), 1-21.
- Hayashi, T., Farrell, M. A., Chaput, L. A., Rocha, D. A., & Hernandez, M. (2010). Lifestyle intervention, behavioral changes, and improvement in cardiovascular risk profiles in the California WISEWOMAN project. *Journal of Women's Health (Larchmt), 19*(6), 1129-1138. doi: 10.1089/jwh.2009.1631
- Himmelgreen, D., Daza, N. R., Cooper, E., & Martinez, D. (2007). "I don't make the soups anymore": Pre- to post-migration dietary and lifestyle changes among Latinos living in

- West-Central Florida. *Ecology of Food and Nutrition*, 46(5-6), 427-444. doi: 10.1080/03670240701486719
- Ickes, M. J., & Sharma, M. (2012). A systematic review of physical activity interventions in Hispanic adults. *Journal of Environmental Public Health*, 2012. doi: 10.1155/2012/156435
- Ingram, M., Ruiz, M., Mayorga, M. T., & Rosales, C. (2009). The Animadora Project: identifying factors related to the promotion of physical activity among Mexican Americans with diabetes. *American Journal of Health Promotion*, 23(6), 396-402. doi: 10.4278/ajhp.08021915
- Jay, M., Gutnick, D., Squires, A., Tagliaferro, B., Gerchow, L., Savarimuthu, S., . . . Kalet, A. (2014). In our country tortilla doesn't make us fat: cultural factors influencing lifestyle goal-setting for overweight and obese Urban, Latina patients. *Journal of health care for the poor and underserved*, 25(4), 1603-1622. doi: 10.1353/pu.2014.0165
- Juarbe, T., Turok, X. P., & Pérez-Stable, E. J. (2002). Perceived benefits and barriers to physical activity among older Latina women. *Western Journal of Nursing Research* 24(8), 868-886. doi: 10.1177/019394502237699
- Keller, C. S., Ainsworth, B., Records, K., Todd, M., Belyea, M., Vega-Lopez, S., . . . Nagle-Williams, A. (2014a). A comparison of a social support physical activity intervention in weight management among post-partum Latinas. *BMC Public Health*, 14, 971. doi: 10.1186/1471-2458-14-971
- Keller, C. S., & Cantu, A. (2008). Camina por Salud: walking in Mexican-American women. *Applied Nursing Research*, 21(2), 110-113. doi: 10.1016/j.apnr.2006.12.003
- Keller, C. S., Coe, K., & Moore, N. (2014). Addressing the demand for cultural relevance in intervention design. *Health Promotion Practice*, 15(5), 654-663. doi: 10.1177/1524839914526204
- Keller, C. S., & Fleury, J. (2006). Factors related to physical activity in Hispanic women. *Journal of Cardiovascular Nursing*, 21(2), 142-145.
- Keller, C. S., Vega-Lopez, S., Ainsworth, B., Nagle-Williams, A., Records, K., Permana, P., & Coonrod, D. (2014b). Social marketing: approach to cultural and contextual relevance in a community-based physical activity intervention. *Health Promotion International*, 29(1), 130-140. doi: 10.1093/heapro/das053
- King, A. C., Castro, C., Wilcox, S., Eyler, A. A., Sallis, J. F., & Brownson, R. C. (2000). Personal and environmental factors associated with physical inactivity among different racial-ethnic groups of U.S. middle-aged and older-aged women. *Health Psychology*, 19(4), 354-364. doi: 10.1037/0278-6133.19.4.354
- Lindberg, N. M., & Stevens, V. J. (2011). Immigration and weight gain: Mexican-American women's perspectives. *Journal Immigrant and Minority Health*, 13(1), 155-160. doi: 10.1007/s10903-009-9298-8
- Marquez, D. X., McAuley, E., & Overman, N. (2004). Psychosocial correlates and outcomes of physical activity among Latinos: A review. *Hispanic Journal of Behavioral Sciences*, 26(2), 195-229.
- Marquez, B., & Wing, R. R. (2013). Feasibility of enlisting social network members to promote weight loss among Latinas. *Journal of the Academy of Nutrition and Dietetics*, 113(5), 680-687



- Marshall, C. & Rossman, G.B. (2011). *Designing Qualitative Research* (5<sup>th</sup> Ed.). Thousand Oaks, CA: SAGE Publications, Inc.
- Martinez, S. M., Arredondo, E. M., Perez, G., & Baquero, B. (2009). Individual, social, and environmental barriers to and facilitators of physical activity among Latinas living in San Diego County: focus group results. *Family & Community Health, 32*(1), 22-33. doi: 10.1097/01.FCH.0000342814.42025.6d
- Mathews, T. J., & Hamilton, B. E. (2016). Mean Age of Mothers is on the Rise: United States, 2000-2014. *NCHS data brief, (232)*, 1-8.
- Mier, N., Medina, A. A., & Ory, M. G. (2007). Mexican Americans with type 2 diabetes: perspectives on definitions, motivators, and programs of physical activity. *Preventing Chronic Disease, 4*(2), A24.
- Mier, N., Ory, M. G., & Medina, A. A. (2010). Anatomy of culturally sensitive interventions promoting nutrition and exercise in Hispanics: a critical examination of existing literature. *Health Promotion Practice, 11*(4), 541-554. doi: 10.1177/1524839908328991
- Mier, N., Tanguma, J., Millard, A. V., Villarreal, E. K., Alen, M., & Ory, M. G. (2011). A pilot walking program for Mexican-American women living in colonias at the border. *American Journal of Health Promotion, 25*(3), 172-175. doi: 10.4278/ajhp.090325-ARB-115
- National Heart, Lung, and Blood Institute. (2015). Calculate Your Body Mass Index. Retrieved from [http://www.nhlbi.nih.gov/health/educational/lose\\_wt/BMI/bmicalc.htm](http://www.nhlbi.nih.gov/health/educational/lose_wt/BMI/bmicalc.htm)
- Olvera, N., Bush, J. A., Sharma, S. V., Knox, B. B., Scherer, R. L., & Butte, N. F. (2010). BOUNCE: A Community-based Mother–daughter Healthy Lifestyle Intervention for Low-income Latino Families. *Obesity, 18*(S1), S102-S104.
- Pekmezi, D. W., Neighbors, C. J., Lee, C. S., Gans, K. M., Bock, B. C., Morrow, K. M., . . . Marcus, B. H. (2009). A culturally adapted physical activity intervention for Latinas: a randomized controlled trial. *American Journal of Preventive Medicine, 37*(6), 495-500. doi: 10.1016/j.amepre.2009.08.023
- Perez, A., Fleury, J., & Keller, C. (2010). Review of intervention studies promoting physical activity in Hispanic women. *Western Journal of Nursing Research, 32*(3), 341-362. doi: 10.1177/0193945909351300
- Prochaska, J. O., & DiClemente, C. C. (1982). Transtheoretical therapy: Toward a more integrative model of change. *Psychotherapy: Theory, Research & Practice, 19*(3), 276. doi: 10.1037/h0088437
- Prochaska, J. O., & DiClemente, C. C. (1983). Stages and processes of self-change of smoking: toward an integrative model of change. *Journal of Consulting and Clinical Psychology, 51*(3), 390-395. doi: 10.1037/0022-006X.59.2.295
- Prochaska, J. O., & Velicer, W. F. (1997). The transtheoretical model of health behavior change. *American Journal of Health Promotion, 12*(1), 38-48. doi: 10.4278/0890-1171-12.1.38
- Prochaska, J. O., Velicer, W. F., DiClemente, C. C., & Fava, J. (1988). Measuring processes of change: applications to the cessation of smoking. *J Consult Clin Psychol, 56*(4), 520-528. doi:10.1037/0022-006X.56.4.520
- Pyatak, E. A., Florindez, D., Peters, A. L., & Weigensberg, M. J. (2014). "We Are All Gonna Get Diabetic These Days": The Impact of a Living Legacy of Type 2 Diabetes on Hispanic Young Adults' Diabetes Care. (5, 40). The Diabetes Educator.

- Ramirez, A. G., Chalela, P., Gallion, K., & Velez, L. F. (2007). Energy balance feasibility study for Latinas in Texas: a qualitative assessment. *Preventing Chronic Disease, 4*(4), A98.
- Rimer, B. K., & Glanz, K. (2005). Theory at a glance: A guide for health promotion practice. Retrieved from <http://www.sbccimplementationkits.org/demandrmnch/wp-content/uploads/2014/02/Theory-at-a-Glance-A-Guide-For-Health-Promotion-Practice.pdf>
- Rooney, B. L., & Schauburger, C. W. (2002). Excess pregnancy weight gain and long-term obesity: One decade later. *Obstetrics & Gynecology, 100*(2), 245-252.
- Sidani, S., & Braden, C. (2011). *Design, evaluation, and translation of nursing interventions*. Hoboken, NJ: Wiley Blackwell.
- Yan, T., Wilber, K. H., Aguirre, R., & Trejo, L. (2009). Do sedentary older adults benefit from community-based exercise? Results from the Active Start program. *Gerontologist, 49*(6), 847-855. doi: 10.1093/geront/gnp113
- Yancey, A. K., Ortega, A. N., & Kumanyika, S. K. (2006). Effective recruitment and retention of minority research participants. *Annals Review of Public Health, 27*, 1-28.