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## Social Network Characteristics Associated With Health Promoting Behaviors Among Latinos

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### Abstract

**Objective:** This study examined the relationship between social network characteristics and health promoting behaviors (having a routine medical check-up, consuming no alcohol, consuming no fast food, and meeting recommendations for leisure-time physical activity and sleep duration) among Latinos to identify potential targets for behavioral interventions.

**Method:** Personal network characteristics and health behavior data were collected from a community sample of 393 adult Latinos (73% women) in San Diego County, California. Network characteristics consisted of size and composition. Network size was calculated by the number of alters listed on a name generator questionnaire eliciting people with whom respondents discussed personal issues. Network composition variables were the proportion of Latinos, Spanish-speakers, females, family, and friends listed in the name generator. Additional network composition variables included marital status and the number of adults or children in the household.

**Results:** Network members were predominately Latinos (95%), Spanish-speakers (80%), females (64%), and family (55%). In multivariate logistic regression analyses, gender moderated the relationship between network composition, but not size, and a health behavior. Married women were more likely to have had a routine medical check-up than married men. For both men and women, having a larger network was associated with meeting the recommendation for leisure-time physical activity.

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**Conclusion:** Few social network characteristics were significantly associated with health promoting behaviors, suggesting a need to examine other aspects of social relationships that may influence health behaviors.

### Keywords

social networks; health behaviors; Latino; men

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Although the role of social networks in the propagation of health behaviors is a burgeoning area of research (Christakis & Fowler, 2013), there has been limited focus on specific subgroups that are at elevated risk for chronic disease such as adult Latinos. As a result, less is known about the relationship between social networks and health behaviors among Latinos whose network features and behavioral patterns differ from non-Hispanic Whites. Compared to non-Hispanic Whites, Latino social networks tend to be smaller, more family based, and less ethnically and gender heterogeneous (Keefe, 1984; Marsden, 1987; Schweizer, Schnegg, & Berzborn, 1998).

In terms of health behaviors, Latinos are less likely to use preventive health care services (Pleis, Ward, & Lucas, 2010), consume alcohol (Schoenborn & Adams, 2010), not eat fast food (Bostean et al., 2013), and are more likely to be physically inactive (Schoenborn & Adams, 2010) and sleep an insufficient number of hours (Hale & Do, 2007) compared with non-Hispanic Whites. Moreover, Latinos are more likely than non-Hispanic Whites to have concurrent behavioral risk factors for chronic disease (Fine, Philogene, Gramling, Coups, & Sinha, 2004). The current study focuses on Latinos and expands on existing research conducted on predominately non-Latinos showing that various network characteristics involving size and composition are associated with health behaviors. We examined five health behaviors implicated in chronic disease prevention (Anderson, Rafferty, Lyon-Callo, Fussman, & Imes, 2011; Li et al., 2011): having a routine medical check-up, consuming no alcohol, consuming no fast food, and meeting the recommendations for leisure time physical activity (LTPA), and sleep duration.

## Social Network Characteristics and Health Behaviors

### Medical Check-Up

Routine medical check-ups are important for early identification of chronic disease but evidence shows that health care seeking behavior often depends on social ties. Network size has been positively associated with attendance to medical visits (Molloy, Perkins-Porras, Strike, & Steptoe, 2008) and use of preventive health services (Berkman & Syme, 1979). Other indicators of structural social support such as marital or relationship status have also been linked to medical visits, with married individuals attending more routine medical check-ups than single individuals (Dryden, Williams, McCowan, & Themessl-Huber, 2012). This difference is even more apparent among men as they are less likely to seek health care than women. For both men and women, a routine medical check-up is positively associated with screening for cancer (López-Charneco et al., 2013; Phillips, Smith, Ahn, Ory, & Hochhalter, 2013). Longitudinal data from the Framingham Heart Study indicates that health screening behaviors of individuals are influenced by the screening behaviors of family.

Specifically, men and women with a spouse who had been screened for colorectal cancer were more likely to undergo colorectal cancer screening (Keating, O'Malley, Murabito, Smith, & Christakis, 2011), and women with sisters who had a mammography in the past year were also more likely to undergo mammography screening themselves.

### **Alcohol Consumption**

Various network attributes have been associated with drinking behavior. Friends' drinking approval and behavior are related to alcohol consumption among adults (Lau-Barraco & Collins, 2011; Moos, Brennan, Schutte, & Moos, 2010). Compared to friends, family members are more likely to recognize and comment on an individual's drinking behavior (Room, Greenfield, & Weisner, 1991). Family relationships have been found to discourage drinking behavior either indirectly by promoting adherence to norms for conventional behavior or directly through intervention (Umberson, 1987). Although more men than women consume alcohol, being married is related to less drinking for both genders (Umberson, 1987, 1992). However, parental status and a greater number of children in the household are related to less drinking among women only (Kuntsche, Knibbe, & Gmel, 2012). Gender has also been found to affect the spread of alcohol consumption across social contacts. For example, data from the Framingham Heart Study revealed that women were significantly more likely than men to influence the drinking behavior of friends and a spouse (Rosenquist, Murabito, Fowler, & Christakis, 2010). Female family members are also more likely than males to be identified by others as sources of pressure to stop drinking (Room et al., 1991).

### **Fast Food Consumption**

Given that fast food consumption is linked to obesity (Anderson et al., 2011) and obesity clusters among socially connected individuals (Christakis & Fowler, 2007), there has been increased effort to understand the role of the interpersonal environment on fast food intake. The peer effect on the frequency of eating fast food has been proposed as a potential mechanism by which obesity spreads within social networks because individuals are more likely to eat fast food if their friends also engage in this behavior (Ali, Amialchuk, & Heiland, 2011). A systematic review of young people's eating behaviors found that frequency of fast food consumption is similar in friendship networks (Fletcher, Bonell, & Sorhaindo, 2011). In general, men report more frequent use of fast food than women (Paeratakul, Ferdinand, Champagne, Ryan, & Bray, 2003) but eating with friends is reported to be important for men and women who are unmarried (Sobal & Nelson, 2003) and this may help explain why they report higher intake of fast food compared to married individuals (Yannakoulia, Panagiotakos, Pitsavos, Skoumas, & Stefanadis, 2008). Evidence suggests that not all familial ties are protective against fast food intake as larger family-based networks or living in larger sized households are associated with fast food consumption (Paeratakul et al., 2003; Powell, Nguyen, & Han, 2012).

### **Physical Activity**

Although men and women embedded in large social networks are more physically active than those in small social networks, the types of social relationships appear to better predict exercise behavior. Larger friendship networks increase the likelihood of LTPA (Tamers et al.,

2013; Yu et al., 2011). In contrast, having a larger family network is associated with less physical activity for women but not men (Dowda, Ainsworth, Addy, Saunders, & Riner, 2003), presumably because of differential gender roles involving caregiving. Similarly, women who are married or live with a partner are less likely to be physically active (Schmitz, French, & Jeffery, 1997; Yu et al., 2011). Even though women in general are less likely than men to meet the national recommendation of at least 150 min per week of moderate or moderate-to-vigorous LTPA (Carlson, Fulton, Schoenborn, & Loustalot, 2010), studies have shown that married women with highly active husbands are similarly active (Petee et al., 2006; Satariano, Haight, & Tager, 2002), suggesting that partners influence each other's activity levels.

## Sleep

Because insufficient sleep has been associated with adverse conditions such as diabetes, obesity, and cardiovascular disease (Knutson, 2010), identifying social factors associated with sleep is important. The current recommended duration of sleep for adults from the National Sleep Foundation is 7 to 9 hr per night ([www.sleepfoundation.org](http://www.sleepfoundation.org)). Large observational studies indicate that married individuals are less likely than unmarried individuals to report short sleep duration (Hale, 2005), but individuals with children living at home report greater insufficient sleep (Chapman et al., 2012). Friendship ties also have been shown to influence sleep behavior. Specifically, individuals were more likely to sleep 7 hr/night if they had a friend who slept 7 hr/night (Mednick, Christakis, & Fowler, 2010), suggesting that network members tend to resemble each other in terms of sleep habits. Despite women being less likely than men to be short duration sleepers (Hale, 2005), they report poorer sleep especially those with fewer friends or low social integration (Nordin, Knutsson, Sundbom, & Stegmayr, 2005).

## Sociocultural Context of Latino Social Networks

Because an individual's behaviors have been found to reflect that of his or her social network, examination of network characteristics could shed light on the larger sociocultural context in which Latinos live. Understanding the relationship between social networks and health behaviors is especially relevant given the collectivist and family-oriented nature of the Latino culture. Compared to non-Hispanic Whites, Latinos tend to have larger family and multigenerational households (Lofquist, 2012; Lofquist, Lugaila, O'Connell, & Feliz, 2012). Evidence suggests that family members help shape behaviors and influence decisions on health. Familism, the interdependence and cooperation among family members, is associated with positive health behaviors (Coonrod, Balcazar, Brady, Garcia, & Van Tine, 1999; Kopak, Chen, Haas, & Gillmore, 2012; McHale, Kim, Kan, & Updegraff, 2011; Suarez, 1994), however, familism appears to decline with acculturation (Sabogal, Marin, & Otero-Sabogal, 1987). In turn, acculturation, measured by English language use, is linked to negative health behaviors such as fewer health screenings (Mack, Pavao, Tabnak, Knutson, & Kimerling, 2009), alcohol consumption (Caetano, 1987; Zemore, 2007), fast food consumption (Van Wieren, Roberts, Arellano, Feller, & Diaz, 2011), sedentary behavior (Banna, Kaiser, Drake, & Townsend, 2012), and insufficient sleep (Seicean, Neuhauser, Strohl, & Redline, 2011).

Hence, personal networks defined by familial relationships, Latino ethnicity, and language acculturation can provide unique insight into cultural factors influencing health.

## Present Study

Understanding social network characteristics could help identify individuals more likely to engage in certain health behaviors and has implications for targeted network-based behavioral interventions. Drawing on prior research, we hypothesized that certain network characteristics would be associated with health promoting behaviors. In line with evidence indicating gender differences, we also expected gender to moderate the relationship between network characteristics and health behaviors, with these associations seen in women. In addition, exploratory analyses examined the moderating role of age on the relationship between network characteristics and health behaviors.

*H1:* A larger network size, a greater proportion of network females, and family members, being married or having a smaller proportion of network Latinos would be associated with having a routine medical check-up.

*H2:* A larger proportion of network Latinos, Spanish-speakers, females, and family members, being married, having more children in the home, or having a smaller proportion of network friends would be associated with consuming no alcohol.

*H3:* A larger proportion of network females, being married, having fewer children and adults living in the home or having a smaller proportion of network Latinos and friends would be associated with consuming no fast food.

*H4:* A larger network size, a greater proportion of network friends, not being married, having fewer children and adults living at home or having a smaller proportion of network Latinos, Spanish-speakers, females, and family members would be associated with meeting the recommendation for LTPA.

*H5:* A larger proportion of network females and friends, being married, having fewer children living in the home, or having a smaller proportion of network Latinos would be associated with meeting the recommendation for sleep duration.

## Method

### Participants

Data were drawn from the San Diego Prevention Research Center's 2009 Household Community Survey (Arredondo et al., 2013). A cross sectional study design was used in which adult Latinos were randomly sampled from the Southern region of San Diego County using multistage sampling methods. Specifically, data from the 2000 U.S. Census were downloaded to obtain the total number of blocks for the target area, the number of households per block, and the number of Latinos per block. From these lists, 200 blocks were randomly sampled with households that included at least one Latino resident. Randomly sampled blocks were visited to verify households and then 4,279 households were randomly sampled from these blocks. Households were visited at least three times to screen for eligibility. If a household member agreed to complete the screening process, a

household roster was completed and if the household was deemed eligible, a Latino adult was randomly sampled from the household roster to complete the full assessment protocol. From among households visited, 64.9% were eligible, 26.4% were ineligible, and 8.8% were of unknown eligibility due to the end of the study period. From among eligible households, 397 (14.3%) women and men completed the full assessment. The interview was conducted in either Spanish or English during a home visit by trained bilingual/bicultural research assistants. The study was approved by the San Diego State University and University of California, San Diego Institutional Review Boards.

## Measures

**Demographic variables.**—Self-reported information on gender, age, education, income, marital status, health insurance status, nativity (U.S. or foreign born), length of U.S. residency if foreign born, and English/Spanish language proficiency were collected. Age was categorized in three groups: 18–35, 36–50, or >50 years old. Gender was coded as female (1) and male (0). Education was coded as high school graduate (1) or not (0). Total household income was split into four categories: <\$10,000, \$10,000–19,999, \$20,000–29,999, or \$30,000. Marital status was coded as married/living as married (1) or not (0). Health insurance status was coded as has coverage (1) or not (0).

**Acculturation.**—Acculturation was assessed using the Bidimensional Acculturation Scale for Hispanics (Marín & Gamba, 1996). The Bidimensional Acculturation Scale consists of three language subscales that measure communication and electronic media use in Spanish and English to produce two cultural domains (Hispanic and non-Hispanic). Acculturation categories were generated based on composite scores from each cultural domain using established cutoff points to reflect the following three groups: Hispanic (maintained traditional practices including almost exclusive use of the Spanish language), bicultural (fairly equal use of Spanish and English), and non-Hispanic (more frequent use of English vs. Spanish language). The scale has high validity and internal consistency (Hispanic domain  $\alpha = .90$  and non-Hispanic domain  $\alpha = .96$ ).

**Social network variables.**—Personal network characteristics were assessed using an egocentric approach that examines the network members (alters) reported by the respondent (ego). Because the ego–alter connection is described from the point of view of the ego, this approach focuses on the relationships directly surrounding the ego (Marsden, 2006). Using a name generator, participants (egos) were asked to list up to 5 people (alters) whom they relied on to talk with about personal issues or problems and to provide information on a variety of features of the listed network members such as ethnicity, language of communication, gender, and relationship type. Assessment of discussion networks selects for close ties (Huang & Tausig, 1990; Marsden, 1987). The average number of network members listed by participants was 3.6.

Social network characteristics used for the present analyses included network size and composition. Network size was calculated by the number of alters listed on the name generator questionnaire. Network composition variables included the proportion of Latinos, Spanish-speakers, females, family, and friends listed in the name generator. Additional

network composition characteristics included marital status and the total number of adults or children living in the household.

**Health behavior variables.**—Five behaviors were classified as health promoting (having a routine medical check-up, consuming no alcohol, consuming no fast food, and meeting recommendations for LTPA and sleep duration) for analyses. These behaviors were selected on the basis that they were among those implicated by the Behavioral Risk Factor Surveillance System (BRFSS; Anderson et al., 2011; Li et al., 2011) in the prevention of chronic disease and were available for secondary data analyses. Having a routine medical check-up was assessed by asking the 2008 BRFSS question, “How long has it been since you last visited a doctor for a routine check-up?” Responses were dichotomized to never or >1 year (0) versus within the past year (1) to reflect the medical recommendation. Consuming no alcohol was determined by asking the 2008 BRFSS question, “During the past 30 days, how many days did you have at least one drink of any alcoholic beverage?” Responses were dichotomized to 1 (0) or <1 (1) days based on the distribution indicating that most participants did not consume alcohol in the last 30 days. Consuming no fast food was determined by asking a question adapted from the 2007 BRFSS, “How many times in a typical week do you eat fast food for breakfast, lunch or dinner? Fast food includes restaurants like McDonalds and Pizza Hut, but also food sold from lunch wagons and vending machines.” Responses were dichotomized to 1 (0) or <1 (1) times/week based on the distribution indicating most participants consumed fast food no more than once a week. Meeting the recommendation for LTPA was assessed using the Global Physical Activity Questionnaire, a 16-item scale that measures physical activity in a typical week (Armstrong & Bull, 2006). Responses were dichotomized to <150 (0) or 150 (1) min/week of moderate-to-vigorous LTPA to reflect national recommendation for physical activity. Meeting the recommendation for sleep duration was assessed by asking a question adapted from the Pittsburg Sleep Quality Index (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989), “During the past month, how many hours of actual sleep did you get on a typical night?” Responses were dichotomized to <7 or >9 (0) and 7 to 9 (1) hr/night to reflect the national recommendation for sleep duration.

## Analysis

A total of 393 participants completed the social network measure and were included for analyses in this study. Given differences observed in the literature, chi-square tests for categorical variables and independent samples *t* tests for continuous variables were used to compare women and men on demographic and social network characteristics. Correlational analyses were conducted to determine interrelationship among social network variables. Multiple logistic regression models were used to determine the association between social network characteristics (independent variables) and health behaviors (dependent variables), while controlling for sociodemographic variables (age, education, income, health insurance status [for model testing routine medical check-up], and acculturation). Interactions between social network characteristics, gender, and age were also tested. To examine the independent contribution of each network characteristic, separate models were tested for each social network characteristic and health behavior. A total of 45 models were tested. Analyses were performed using PASW Statistics 20.

## Results

### Description of Sample Characteristics

Demographic characteristics by gender are presented in Table 1. Participants ranged in age from 18 to 89 years, with the average age of  $43.4 \pm 16.8$ . The majority of participants were women with less than a high school education and living in low-income households. Over three-fourths were born outside the United States, spoke Spanish well or very well, and were Hispanic or bicultural. Significantly more men than women had higher household incomes, English-language proficiency, and were bicultural or non-Hispanic on the acculturation scale.

### Social Network Characteristics

Social network characteristics are shown in Table 2. The average number of network members listed by participants was 3.6. Network members were predominately Latino. Respondents spoke Spanish with the majority of their network members. More than half of the network consisted of females or family members. Compared to men, women had significantly more children living in the household and female network members.

### Correlations Among Social Network Characteristics

Intercorrelations among social network characteristics were determined. Being married was positively associated with the number of adults in the household ( $r = .13, p < .01$ ) and the proportions of network Latinos ( $r = .10, p = .03$ ) and Spanish-speakers ( $r = .16, p < .01$ ). The proportions of network Latinos and Spanish-speakers were positively related to each other ( $r = .36, p < .01$ ) and the proportions of network females ( $r = .11, p = .02$ ;  $r = .12, p = .02$ , respectively) and family members ( $r = .11, p = .01$ ;  $r = .12, p = .01$ , respectively). A larger proportion of network females was related to a larger proportion of network friends ( $r = .15, p < .01$ ). On the other hand, a larger proportion of network family members was associated with a smaller proportion of network friends ( $r = -.81, p < .01$ ).

### Health Behaviors

Health behaviors by gender are presented in Table 3. The majority of women and men reported having a routine medical check-up in the past year, consuming no alcohol in the past month, and meeting the recommendation for sleep duration on a typical night. Fewer than half indicated consuming no fast food and only a quarter reported meeting the recommendation for LTPA in a typical week. Significantly more women than men reported consuming no alcohol or fast food but more men than women reported meeting the recommendation for LTPA.

### Multivariate Analyses of Social Network Characteristics and Health Behaviors

Multivariate models tested the relationships between social network characteristics and health behaviors, and whether gender moderated these relationships (see Table 4). Married women were more likely to have had a routine medical check-up (odds ratio [OR] = 5.15, confidence interval [CI] = 1.34–19.81,  $p = .01$ ) than married men. For both men and women,

having a larger social network was associated with meeting the recommendation for LTPA ( $OR = 2.30$ ,  $CI = 1.03\text{--}5.15$ ,  $p = .04$ ).

Exploratory analyses examined the moderating role of age on the relationship between social network characteristics and health behaviors. Compared to individuals 18–35 years old, individuals over 50 years old with a larger proportion of network females were less likely to have had a routine medical check-up ( $OR = 0.05$ ,  $CI = .01\text{--}.91$ ,  $p = .04$ ). Individuals 36–50 ( $OR = 0.44$ ,  $CI = .21\text{--}.93$ ,  $p = .03$ ) and over 50 years old ( $OR = 0.38$ ,  $CI = .17\text{--}.83$ ,  $p = .01$ ) living with more adults were less likely to meet the recommendation for sleep duration than individuals 18–35 years old. However, individuals 36–50 years old living with a greater number of adults were more likely to not consume alcohol ( $OR = 1.83$ ,  $CI = 1.04\text{--}3.22$ ,  $p = .03$ ) than individuals 18–35 years old. Individuals over 50 years old with smaller social network were less likely to consume fast food ( $OR = 0.52$ ,  $CI = .27\text{--}.97$ ,  $p = .04$ ) than individuals 18–35 years old.

## Discussion

This study provides preliminary data on the social network characteristics and health behaviors of a community sample of Latino women and men. The social networks of our sample were dominated by Latino family members with whom they communicated in Spanish. These network features are consistent with other studies showing that the personal networks of Latinos tend to be more family based and ethnically homogeneous compared to non-Hispanic Whites (Keefe, 1984; Schweizer et al., 1998). Latino networks are also characterized as tightly integrated and locally bounded as family members typically reside within the same neighborhoods.

Interrelationships among social network variables in the current study speak to the family oriented nature of Latino networks. First, married individuals were predominately connected to those they resided with who were Latino and Spanish-speaking adults. Second, Latino-dense networks were mainly composed of females and family members who were likely less acculturated based on Spanish language use. Third, networks with a larger proportion of family members had fewer friends consisting of females. These family related network attributes offer some insight into culturally salient sources of influence and support for health behaviors.

### Having a Routine Medical Check-Up

Our data revealed that having a routine medical check-up in the past year was not significantly different between Latino men and women but this varied by marital status. Married women had a higher likelihood of having a routine medical check-up than did married men, which is consistent with our hypothesis and studies on predominately non-Hispanic Whites showing that family members serve to encourage health promoting behaviors. Although tending to reproductive care may contribute to greater utilization of health services for married women, other studies report higher health care seeking behavior among women regardless of marital status (Dryden et al., 2012), supporting the idea that women in general tend to engage in more preventive health behaviors than men. In fact, whereas married men most often identify their wives as individuals who monitor and

attempt to control their health, married women most often name other women in the family including their mothers and daughters (Umberson, 1992). Some have suggested that marriage serves as a proxy for social support and could help explain why married individuals are generally healthier (Verbrugge, 1979).

Although people are more likely to discuss health-related matters with women (Perry & Pescosolido, 2010), our data indicate that social ties to women may not necessarily translate into health seeking behavior for older Latinos because those with a larger proportion of network females were less likely to have had a routine medical check-up. This may speak to the experiences of social network members with health care service because experiences are often shared with family and friends. Latinos indicate using these shared stories to inform their decisions in seeking care and undergoing health screenings, with negative testimonials instilling reluctance (Ashida, Wilkinson, & Koehly, 2012; Shaw, Vivian, Orzech, Torres, & Armin, 2012).

Other features such as network size, gender, and ethnicity have been previously linked to health care utilization among Latinos. Among Mexican American women, a larger social network was associated with higher Pap smear and mammography use (Suarez, Lloyd, Weiss, Rainbolt, & Pulley, 1994). A greater number of close friends in particular was an important predictor of screening behavior. Latinas have reported relying on connections to bilingual friends to help them navigate the health care system (Derose, 2000). Acculturation or use of the English language among Latinas is associated with more information seeking and greater involvement in medical care (Tortolero-Luna et al., 2006). Thus, use of medical services among Latinas may be facilitated by their ability to speak English and/or English-speaking friends that share health-related information as well as influence health care seeking behavior by modeling or establishing a norm. On the other hand, receiving information on how to access health services from Spanish-speaking friends and family can promote health care utilization among immigrant Latinos. Specifically, access to health care for Mexican American men and women was previously found to be related to living in communities highly populated by Latinos, immigrants, or Spanish-speakers (Gresenz, Rogowski, & Escarce, 2009). Hence, for immigrants, the flow of information or the emulation of care seeking behavior among social contacts similar in gender, ethnicity, and acculturation appears to play a role in decisions involving health care use.

### **Consuming No Alcohol**

We found that fewer women than men consumed alcohol in the last 30 days but contrary to expectation, we did not find any relationship between social network characteristics and alcohol consumption. We had proposed that having a larger proportion of network family members or Latinos would be associated with consuming no alcohol because family relationships had been described as having a protective effect on drinking behavior especially among Latinos. Moreover, Spanish-language use, an indicator of low acculturation, by network members had been shown to decrease the risk of substance use (Allen et al., 2008). Lack of support for our hypothesis in this respect may be attributed to the low variability in network characteristics, as networks were highly homogeneous in

terms of ethnicity and language use and alcohol consumption was low especially among women which were the majority of our sample.

Examination of the different age groups revealed that middle-aged individuals who lived with a greater number of adults were more likely to not consume alcohol than younger individuals. Household adults are likely family members. Larger family households have been linked to lower alcohol consumption in Latinos (Stroup-Benham, Trevino, & Trevino, 1990). Living with more adults may be indicative of reinforcement of social or cultural norms related to drinking for middle-aged individuals.

### **Consuming No Fast Food**

Consuming no fast food in a typical week was more common among Latino women than men but it was not related to any network attribute. Native and foreign-born Latinos are more likely to report eating fast food than non-Hispanic Whites of the same nativity status (Bostean et al., 2013). In both ethnic groups, U.S.-born individuals report more frequent intake. Hence, we may have been unable to detect a link for reasons related to the nativity status and perhaps low language acculturation of our sample. Specifically, our sample consisted of mostly foreign-born and Spanish-speaking Latinos who consumed fast food either not at all or no more than one time in a typical week. Alternatively, given that our assessment of fast food consumption was based on a single item that did not describe ethnic or neighborhood restaurants, which may be preferred, it is possible that we did not adequately capture this behavior.

In looking at the role of age in the relationship between social network characteristics and consuming no fast food, we found that older individuals with a smaller social network were less likely to consume fast food. A small social network may present fewer opportunities for commensality, as eating fast food has been cited as a way of socializing with family and friends (Rydell et al., 2008). Social integration and companionship at mealtime play important roles in the dietary intake and quality of older adults (Dean, Raats, Grunert, & Lumbers, 2009; McIntosh, Shifflett, & Picou, 1989; Sahyoun & Zhang, 2005; Vesnaver & Keller, 2011).

### **Meeting Recommendation for LTPA**

Meeting the recommendation for LTPA in a typical week was more prevalent in Latino men than women but larger network size was associated with meeting the recommendation regardless of gender, which is in line with other studies (Tamers et al., 2013; Willey, Paik, Sacco, Elkind, & Boden-Albala, 2010). Unlike prior reports, more friends were not related to physical activity (Yu et al., 2011). Family members were also not associated with physical activity. Prior research has linked being married and larger family size to less physical activity among women (Dowda et al., 2003). In the present study, larger networks were likely composed of a combination of friends and family, which indicates some network heterogeneity. This network attribute was previously shown to be important to physical activity, as individuals with fewer types of social relationships or more homogenous networks were more likely to report insufficient exercise (Cohen, Doyle, Skoner, Rabin, & Gwaltney, 1997). Diverse social networks are believed to introduce and transmit new

behaviors across socially connected individuals. Low ethnic heterogeneity may help explain the lack of relationship between network Latinos and respondent physical activity, given that Spanish-speaking Latino women in particular have high rates of inactivity (Crespo, Ainsworth, Keteyian, Heath, & Smit, 1999; Crespo, Keteyian, Heath, & Sempos, 1996; Neighbors, Marquez, & Marcus, 2008).

### Meeting Recommendation for Sleep Duration

Men and women did not differ in meeting the recommended hours per night of sleep in a typical week. Surprisingly, although women had significantly more children living at home than men, they were equally likely to sleep 7–9 hr/night. Longitudinal observation of sleep among parents finds that parents of minor children have short sleep duration but sleep duration increases as children age into adulthood (Hagen, Mirer, Palta, & Peppard, 2013). Sleep duration of parents with many children approaches that of parents with fewer children as children transition into adulthood. Sleep problems have been associated with cosleeping with children, a practice significantly more common among Latino than non-Hispanic White women (Colson et al., 2013; Schachter, Fuchs, Bijur, & Stone, 1989). Family members were also expected to be related to not meeting the recommendation for sleep among women as they may be an indicator of greater demands. Conversely, friends had been suggested to provide some benefit to sleep for women in a previous study (Nordin et al., 2005). Data also did not support our contention that fewer network Latinos would be associated with meeting the recommendation for sleep duration. Evidence based on National Health and Nutrition Examination Survey data indicates that Latinos are at increased risk for short sleep duration (<7 hr/night) compared to non-Hispanic Whites but this appears to depend on acculturation for both men and women (Hale & Do, 2007; Seicean et al., 2011).

When different age groups were examined, we found that middle-aged and older individuals living with more adults were less likely to meet the recommendation for sleep duration. Household or family structure is known to affect sleep. Multigenerational or shared households are common among Latinos particularly immigrants and those of lower income (Vespa, Lewis, & Kreider, 2013). This living arrangement is often indicative of economic strain (Mykyta & Macartney, 2012). Moreover, adults in shared households are typically relatives such as parents and adult children of householder. Family responsibilities involving caregiving have been associated with poorer sleep related to less perceived social support (Brummett et al., 2006).

### Study Limitations

This study has some limitations. First, causality cannot be inferred given the cross sectional nature of the data. Second, our sample size was small and men consisted of fewer than 30% of the sample. Third, our operationalization of acculturation was limited to language use and does not reflect the changes that may occur in social interactions during the acculturation process (Berry, 2005). Fourth, some behaviors were assessed through single-item questions with specific timeframes that differed across behaviors. Finally, alcohol consumption was quantified based on the distribution of the sample rather than research showing curvilinear effects of alcohol consumption on health.

## Conclusion

Given that one main effect and one interaction was observed of the 45 models tested, there is little support for the predicted associations between social network characteristics and health promoting behaviors. With the exception of social network size and physical activity, the relationships between characteristics of social networks and health behaviors differed by gender and age. It is worth noting that this study examined close social ties and the effects of social network characteristics did not control for other aspects of the network. Examination of social integration such as frequency of contact with network members or specific interactions with network members may provide a better assessment of the association between social networks and health behaviors.

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**Table 1**

Participant Demographic Characteristics by Gender

Variable	All	Women	Men	<i>p</i> value
<i>n</i>	393	73.3%	26.7%	
Age (years)				
18–35	36.2	35.9	37.1	0.969
36–50	34.2	34.5	33.3	
>50	29.6	29.6	29.5	
Education				
Less than high school graduate	54.1	55.4	50.5	0.386
High school graduate or more	45.9	44.6	49.5	
Annual income				
<\$10,000	24.4	29.6	13.0	0.007
\$10,000–19,999	24.8	28.6	26.1	
\$20,000–29,999	18.6	16.6	22.8	
\$30,000	29.2	25.1	38.0	
Health insurance coverage	57.3	54.4	65.4	0.051
Acculturation indicators				
Nativity				
Foreign born	77.3	77.7	76.2	0.752
Years in United States	20.68 ± 15.28	20.01 ± 13.53	22.39 ± 13.07	0.181
Language spoken				
Spanish well–very well	97.2	97.5	96.2	0.478
English well–very well	59.6	56.6	67.5	0.050
BAS categories				
Hispanic	51.0	55.4	39.3	0.008
Bicultural	43.9	40.8	52.3	
Non-Hispanic	5.1	3.8	8.4	

Note. Data are % or mean ± *SD*. BAS = Bi-dimensional Acculturation Scale.

**Table 2**

## Social Network Characteristics by Gender

Characteristic	All	Women	Men	<i>p</i> value
Married	60.1	57.7	66.7	0.108
Adults in household	2.37 ± 1.02	2.33 ± 1.04	2.46 ± 0.98	0.291
Children in household	1.29 ± 1.30	1.42 ± 1.36	0.95 ± 1.07	0.001
Network size	3.58 ± 1.29	3.56 ± 1.31	3.62 ± 1.22	0.688
Latinos	95.9	95.7	96.4	0.653
Spanish-speakers	80.7	82.0	77.2	0.233
Females	64.4	69.1	51.5	0.001
Family	55.3	54.9	56.6	0.671
Friends	29.4	30.6	26.1	0.246

*Note.* Data are % or mean ± *SD*.

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**Table 3**

Health Promoting Behaviors by Gender

Behavior	All	Women	Men	$\chi^2$	df	N	p value
Having a routine medical check-up	66.7	69.2	59.6	3.17	1	390	0.075
Consuming no alcohol	63.4	68.5	49.5	12.10	1	393	0.001
Consuming no fast food	38.0	42.2	26.7	7.83	1	392	0.005
Meeting recommendation for LTPA	27.2	21.7	42.3	16.39	1	390	0.001
Meeting recommendation for sleep duration	63.6	61.8	68.6	1.53	1	387	0.216

Note. Data are %. LTPA = leisure time physical activity.

**Table 4**Social Network Characteristics and Health Behavior Multivariate Models<sup>a</sup>

Characteristic and model	Odds ratio	95% confidence interval	<i>p</i> value
Having a routine medical check up			
Married × Gender	5.15	1.34–19.81	.01
Meeting recommendation for LTPA			
Social network size	2.30	1.03–5.15	.04

*Note.* LTPA = leisure time physical activity

<sup>a</sup>Forty-five models were tested. Only significant results are presented.

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