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Predictors of parent–child relationships that support physical activity in Mexican–American families

Kayla de la Haye,

RAND Corporation, 1776 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138, USA

Hendrik Dirk de Heer,

Department of Physical Therapy and Athletic Training, Northern Arizona University, Flagstaff, AZ, USA

Anna V. Wilkinson, and

University of Texas School of Public Health, Austin Regional Campus, Austin, TX, USA

Laura M. Koehly

Social Network Methods Section, Social and Behavioral Research Branch, National Human Genome Research Institute, Bethesda, MD, USA

Kayla de la Haye: delahaye@rand.org

Abstract

Family-based physical activity (PA) interventions would benefit from research that identifies how to build support for PA among family members. This study examined the extent to which relationships of encouragement to do PA, and co-engagement in PA, exist among Mexican–American parents and children, and sought to identify individual, relational, and household factors associated with these dimensions of support. Participants were 224 Mexican-origin adults, with at least one child aged 5–20 years, participating in a larger study conducted between 2008 and 2010. In baseline surveys, adult participants enumerated the names and attributes of their family and kin; this study focuses on 455 parent–child dyads, nested in 118 households. Parental encouragement of PA in their children was found in about half of dyads, and in 20 % of dyads children encouraged parents. Encouragement relationships were highly reciprocal. Reciprocal parent–child encouragement was also positively associated with co-participation in PA; the latter found in just 17 % of dyads. Results indicated that relational, individual, and socio-cultural attributes were associated with PA support among parents and children, and provide insights into how these relationships might be fostered within Mexican–American families.

Keywords

Physical activity; Parent; Child; Mexican–American; Support

Introduction

Physical activity (PA) benefits both adults and children (Blair & Morris, 2009; Hallal et al., 2006), and regular PA is known to improve life satisfaction (Waller et al., 2010) and protect against ill-health (Blair & Morris, 2009). Yet, most Americans do not meet recommended PA guidelines (Brownson et al., 2005). Rates of physical inactivity are especially high among Mexican-Americans (Park et al., 2003) and this community also has higher rates of associated chronic conditions (Flegal et al., 2010; Ogden et al., 2010; Ong et al., 2008; Park et al., 2003). Effective promotion of PA may be one way to reduce disease burden in this at-risk community, whose population reached 31.8 million in 2010 (United States Census Bureau, 2011).

Physical activity in a family context

Because PA typically takes place in social contexts, interventions seeking to promote PA should take into account how these environments can shape and support behavior change. Family environments are especially salient because family members share both genetic and environmental risk factors associated with chronic health conditions. One such risk factor is physical inactivity, which tends to cluster within families and households (Simonen et al., 2002). The impact of the family is also enduring: the family context is a key environment in which children are socialized into a range of health behaviors, including PA, and these early experiences shape trajectories of these behaviors over the life course (Kelder et al., 1994). Aggregation of PA within Mexican-American families has been found to be even stronger relative to non-Hispanic white families (Sallis et al., 1988), suggesting that family-focused interventions are especially important in this community.

A large body of empirical and theoretical work has identified processes through which individuals' health behaviors are influenced by their social ties, including social facilitation (Zajonc, 1965, 1968), social modeling (Bandura, 1977), and social support (Cohen, 2004; Cohen & McKay, 1984). Intra-familial influences on PA may be explained by some or all of these processes, although much of the empirical research has focused on the role of social support, with few studies explicitly testing competing underlying mechanisms. Moreover, research examining the interpersonal processes among family members that shape PA has typically focused on how parents influence their children. In two recent reviews of this literature (Beets et al., 2010; Edwardson & Gorely, 2010), the provision of social and tangible support by parents was found to promote children's engagement in PA. Specifically, provision of transportation, money, and opportunities to do PA by parents has a positive impact on children's activity levels (Edwardson & Gorely, 2010). Children are also more likely to engage in PA if they receive encouragement to do so from their parents; support that appears to promote perceptions of self-efficacy and competence, as well as positive attitudes towards PA and intentions to participate in these types of activities (Beets et al., 2010; Edwardson & Gorely, 2010). In both of these reviews, parents' participation in PA with their children was also identified as a consistent predictor of child PA. Although not tested explicitly, the positive effect of parent-child co-engagement in PA may be explained by two mechanisms: social facilitation, whereby co-engagement in activities promotes increased duration or intensity of activities or provides increased opportunities for

PA; and social modeling, where children adopt the healthy behaviors exhibited by their parents.

Although family relationships are typically hierarchical, in that influence often flows from parents to children, children are not passive actors in family dynamics and may play an important role in shaping family health behaviors. Children may not be likely to increase family PA through the provision of tangible resources; however, it is plausible that they influence their parents through encouragement and support. For example, older children may play an important role in shaping family health behaviors as they become more independent and are exposed to behaviors and norms outside the family environment.

In a qualitative study, Latino and African-American adults with diabetes reported that their children reminded them to do PA, and would initiate joint exercise (Laroche et al., 2009). Currently, it is not clear if children are primarily motivated to encourage their parents to adopt healthy behaviors in response to ill health, or if these findings also extend to children whose parents are in good health. A useful framework from which to think about the role of family health in fostering relationships that support healthy behaviors is the communal coping model (Afifi et al., 2006; Lyons et al., 1998). This model proposes that communication about a health threat among family members, followed by a shared appraisal of that threat, may lead to cooperative action to address the health threat (Koehly & Loscalzo, 2009). One interpretation of Laroche et al. (2009) finding is that children's encouragement and co-engagement in PA with ill parents reflects a communal coping process, motivated by the families appraisal of a health threat.

Overall, the literature reviewed here indicates that supportive relationships that provide encouragement to do PA, and involve co-engagement in PA, are likely to foster social influence processes among family members that increase their activity levels. Additionally, our critique of this work suggests that social influence and social learning processes within the family context may be more appropriately interpreted from a systems or network perspective (Urban et al., 2011; Valente, 2010). Rather than viewing support as an individualistic phenomenon, this approach will allow us to consider the bidirectional and collective nature of family influence on PA, characteristics of parent-child relationships, and family contexts in which these parent-child dyads are embedded, that may also facilitate or hinder support. Finally, considering how family health threats might elicit a 'communal' response that stimulates these supportive relationships and the adoption of healthy behaviors will point to the usefulness of the communal coping model as a framework for future interventions. Focusing explicitly on Mexican-American families and family dynamics will allow us to identify social processes that may be unique to promoting family support for PA in this population.

Currently, there is a need to understand the extent to which relationships of encouragement and co-engagement in PA exist between children and parents in Mexican-American families and the factors associated with co-operative support and action that might promote increased family PA. A small number of studies have explored attributes of parents or children that are associated with supportive PA relationships (typically support provided by parents) in general populations. Parental encouragement of PA and co-engagement in PA with their

children has been found to differ based the child's developmental stage (Alderman et al., 2010; Lee et al., 2010), with parental support for PA decreasing as children transition into late adolescence (Bauer et al., 2011). There is also evidence that parents' encouragement differs based on the gender of the child (Bauer et al., 2011). Parent's health status also may affect their ability to provide PA support to their children or model healthy behaviors. Finally, broader household and social factors, such as household composition, socio-economic status, and acculturation may also be related to engagement in PA (and potentially support for PA) in this community.

Investigating the prevalence and predictors of parent–child support for PA in Mexican–American families

The current study seeks to understand the extent to which relationships of encouragement to do PA, and co-engagement in PA, exist among Mexican–American parents and children. The second aim of this study is to identify individual, relational, and household factors that are associated with these parent–child relationships. Specifically, we test if demographic or health attributes of the parent and child (including parent PA), characteristics of the dyad (closeness and gender homophily), and characteristics of the household (number of children, socio-economic status, acculturation) predict encouragement and co-engagement ties in parent–child dyads. Based on the literature reviewed, we anticipate that parents' will provide greater support to younger children. We also test if relationships of encouragement to do PA tend to be reciprocated between parents and children, and if encouragement is associated with co-engagement in PA. To explore the potentially important role of health threats in family engagement in PA and support for PA, we also test if supportive relationships are differentially related to PA among parents in good versus poor health.

Method

Procedure and sample

The sample for the current study was drawn from participants in a larger project Risk Assessment for Mexican–Americans (RAMA), a longitudinal study using family health history information to promote communication and health behavior change in multigenerational families (Koehly et al., 2011). Participants in RAMA were originally recruited from an ongoing population-based cohort that includes over 21,000 Mexican–American participants living in Houston, Texas. The cohort, known as the Mexican–American Cohort Study, was established in 2001 and is maintained by The University of Texas MD Anderson Cancer Center Department of Epidemiology (Wilkinson et al., 2005).

Recruitment for RAMA took place in 2008 and focused on multigenerational cohort families, which were eligible for participation if there were at least three adults willing to participate, and if two of these adults were biological relatives and living in the same household. Eligible families were randomly contacted by phone and invited into the study. Agreement to participate in the study by at least three adult household members was followed by in-home visits by a pair of bilingual interviewers who recruited and obtained written consent for study participation. A total of 497 adult participants from 162 households were recruited; the current study focuses solely on participants with children

aged 5–20 years who were living at home ($N = 224$). The Institutional Review Boards of The National Human Genome Research Institute and the University of Texas MD Anderson Cancer Center approved all study protocols.

Measures

Participants completed the baseline questionnaire during in-home assessments conducted in English or Spanish. The questionnaire included self-reported demographic, behavioral and health measures, as well as a section about the respondents' family and social kin. In this latter section, items were developed based on established procedures for measuring personal, 'egocentric' networks (McCarty, 2002; McCarty et al., 1997) whereby participants enumerated the names of their family members and other important persons and were asked to report on each person's basic demographics, health status and history, and the nature of the relationship they shared. A long history of research applying social network analysis provides support for the validity of single-item name generation measures to identify network members and relationship qualities (e.g., friendship, support, advice sharing etc.), and that these measures are fairly accurate in assessing long standing relationships (Freeman et al., 1987; Marsden, 2005). The sample drawn for the current report ($N = 224$) enumerated 256 children, aged 5–20 years, who lived in their parents' household at the time of the study. This resulted in a total sample of 455 parent–child dyads, nested in 118 households (with an average of 2.2 children per household) that are the focus of the current analyses. All measures included in the current study were based on parent report.

Relationships of encouragement to do PA and co-engagement in PA—From the list of enumerated family members, respondents identified who they encouraged to get regular PA, as well as which family members *encouraged them* to get regular PA (where 1 = an encouragement relationship). These are standard items used to measure encouragement in studies of personal networks, and have been found to be associated with a range of actual and intended health behaviors (Ashida et al., 2010, 2012; Ersig et al., 2009), as well as associated with other communication and support relationships in families (Ashida et al., 2011), providing support for construct validity. Four categories of parent–child dyads were identified from these responses: (1) dyads who shared no encouragement, (2) dyads in which the parent encouraged the child to do PA, (3) dyads in which the child encouraged the parent to do PA, and (4) dyads with reciprocal encouragement (parent and child encourage each other). From the list of enumerated family members, respondents also identified 'with whom they often exercise.' From this information, parent–child dyads were coded as 1 *exercise together* or 0 *don't exercise together*.

Parent attributes—Respondents reported on their gender (male, female) and age in years. Acculturation was captured using the Demographic Index of Cultural Exposure (DICE) scale (Cruz et al., 2012), derived from six dichotomous indicators that reflect US cultural exposure. A value of "1" was assigned to each of the following items, which were summed to create the final scale: (1) country where participant attained highest level of formal education, (2) country where participant lived the longest, (3) participant language of interview, (4) participant country of birth, (5) participant mother's country of birth, and (6) participant father's country of birth.

Parents' self-rated health was assessed by the question *In general, would you say your health is* rated on a 5 point scale from *excellent* to *poor*. Parent self-reported height and weight were used to calculate body mass index (BMI) (kg/m^2), and BMIs were subsequently classified into three categories of nonoverweight (BMI $<25 \text{ kg}/\text{m}^2$), overweight (BMI 25–29.9 kg/m^2), and obese (BMI $\geq 30 \text{ kg}/\text{m}^2$). Parent PA was derived from two items measuring weekly frequency and quantity of PA. The first asked “On average, how many times per week do you participate in physical activity, such as: walking, mowing the lawn, running, gardening, exercise classes, dancing, bicycling, soccer, swimming?” Responses were recorded on a 5-point scale from *never* to *5 or more times a week*. The second item asked, “on average, how long do you do these activities each time?” with responses coded on a 5 point scale from *less than 10 min* to *40 or more minutes*. Average weekly minutes of PA was calculated by multiplying these two items; this was recoded into a scale where one unit represented 30 min of PA.

Child attributes—Parents reported on the gender (male, female) and age (in years) of their children during the enumeration of their family network. Child age was recoded into three categories to reflect key developmental stages: 5–11, 12–16, and 17–20 years.

Dyadic attributes—A dyadic variable based on the sex of both the parent and child was created resulting in four discrete categories: mother-daughter, mother-son, father-daughter, and father-son. Whether or not the parent and child shared a close relationship was also included as a predictor variable, based on parents identifying ‘who is very close to you’ from their enumerated family members (where 1 = close relationship).

Household attributes—Household socio-economic status was captured by parent report of whether or not they owned the house in which they currently live, and whether or not they owned or leased a car. A summed household variable was computed using these two items whereby 0 = don’t own a house or car, 2 = own a home or car, and 3 = own a home and car.

The number of children living in the household who were aged between 5 and 20 years, derived from parent’s enumeration of their family members, was also included as a predictor variable.

Statistical analysis

Generalized estimating equations, with an exchangeable covariance structure, were used to account for the clustering of parent–child dyads within households. Logistic regression models were estimated predicting three dependent relational variables: dyads in which parents encouraged their children to do PA, dyads in which children encouraged their parents to do PA, and dyads that co-engaged in PA. Final models were specified using a forward selection process where effects for blocks of variable types—parent, child, household, and dyadic—were estimated and significant effects (where $p < .05$) were retained and estimated in a final model.

Results

Descriptive results

Attributes of the 455 parent–child dyads included in these analyses are described in Table 1. The proportion of parent–child dyads sharing relationships of encouragement was as follows: in 48.7 % of dyads parents encouraged their children to do PA, and in 19.6 % of dyads children encouraged their parents to do PA (this relationship was reciprocal in 15.2 % of dyads). Thus, when children encouraged parents to do regular activity it was typically as part of a reciprocal encouragement relationship, and rarely was the encouragement solely from child to parent (4.4 %). Less than one in five parent–child dyads (16.7 %) engaged in PA together. These dyads were also characterized as having an even distribution of gender-defined dyad-types, and about half (57.6 %) of relationships were defined as ‘close’ by parents. The health of parents ($N = 224$) in this sample was fairly poor, as the vast majority were overweight or obese (82.7 %) and 37.6 % reported poor or fair health. Parents’ average weekly participation in PA was 94.4 min, which falls below national recommendations of 150 min of moderately intense PA per week (US Department of Health and Human Services, 2008). The majority of these households (69.1 %) owned both a home and car, and average values on the DICE acculturation scale were close to 1 (where US acculturation is captured on a scale from 0 to 6, with 6 representing the highest level of acculturation).

Factors predicting encouragement and co-engagement in PA

Results of the final models predicting parent–child encouragement, child–parent encouragement, and parent–child co-engagement in PA are presented in Table 2.

Parents encouraging children to do PA—Overweight parents were almost 50 % less likely than obese parents to encourage their child to do PA (OR = 0.52; 95 % CI 0.27, 0.99), however there were no significant differences between nonoverweight and obese parents. Parents with higher scores on the DICE scale (and thus greater US acculturation) were also less likely to encourage their child to do PA (OR = 0.80; 95 % CI 0.65, 0.98), with a 1-Unit increase on this scale associated with a 20 % reduced likelihood of encouragement. Parents’ encouragement of child PA (48.7 % of dyads) was further predicted by closeness, with encouragement over two times more likely to be observed in dyads who shared a close relationship relative to those who did not (OR = 2.39; 95 % CI 1.35, 4.24). Parent–child encouragement was also three times more likely to be observed in dyads where the child also encouraged the parent to do PA (OR = 3.34; 95 % CI 1.35, 7.90). Parent self-rated health and participation in PA were not associated with parent encouragement, nor was child age, dyad gender type, household socio-economic status, or household size (i.e., number of children).

Children encouraging parents to do PA—Relationships in which parents reported that they were encouraged to do PA by their child (19.6 % of dyads) were significantly less prevalent in dyads where the parent did more PA (OR = 0.87; 95 % CI 0.77, 0.99), with every additional 30 min of PA associated with a 13 % reduced likelihood of encouragement. Children’s encouragement of their parents’ PA was over three times more likely in dyads where the parent also encouraged the child to engage in regular PA (OR = 3.53; 95 % CI

1.52, 8.21), indicating that these relationships tended to be reciprocal. Parent health (weight category, self-rated health), child age, dyad gender type, dyad closeness, and household variables (home/car ownership, acculturation, size of household) were not associated with child encouragement of parent PA.

Parent child co-engagement in PA—Parent weight was significantly associated with co-engagement in PA, whereby dyads in which the parent was overweight were over three times more likely to involve co-engagement in PA (OR = 3.40; 95 % CI 1.16, 9.94), compared to dyads in which the parent was obese. Co-engagement in PA among nonoverweight and obese parents did not significantly differ. Parent self-rated health and PA were not associated with co-engagement. Relative to mother-daughter dyads, father-daughter dyads were significantly less likely to co-engage in PA (OR = 0.07; 95 % CI 0.01, 0.36). Parent-child dyads were eight times more likely to engage in PA together if they shared a close relationship (OR = 8.18; 95 % CI 2.01, 33.34) and were over five times more likely to do so if there was also *reciprocal* encouragement between the parent and child to do regular PA (OR = 5.41; 95 % CI 1.82, 16.10). Of note, the association between encouragement for PA and co-engagement in PA was only found to be significant when this relationship was reciprocal, not when the encouragement relationship was unilateral (e.g., from parent to child *or* child to parent). Household variables did not significantly predict co-engagement in PA.

Analysis exploring interactions between parent health and parent PA

In a second model, we assessed whether parent's health status moderates the relationship between their participation in PA and the dependent relational variables, because support may be differentially related to PA for parents in good versus poor health. To test this, we estimated the models above including an interaction between parent PA and two dimensions of health: self-rated health and weight category.

In a model predicting parent's encouragement of child PA (Table 3), the main effect of parent self-rated health became significant, as did the interaction between self-rated health and parent PA. This positive interaction indicates that it is parents in good health (vs. those whose health was fair/poor), who are also active, that tend to encourage their children to do PA (OR = 1.42; 95 % CI 1.07, 1.88). There was no evidence of an interaction between parent weight status and PA, while the main negative effect of parent overweight (vs. obese) remained significant (OR = 0.40; 95 % CI 0.20, 0.81). Effects of closeness, acculturation, and children's encouragement of parents' PA also remained significant positive predictors of parent-child encouragement.

In models predicting child encouragement of parent PA, we found a significant interaction between parent weight and parent PA. This interaction indicates that nonoverweight parents (relative to obese parents), who were less active, were more likely to receive encouragement from their children (OR = 0.60; 95 % CI 0.37, 0.97). Therefore, inactive parents who were obese were *less* likely to receive encouragement from their children. There were no significant interactions between parent self-rated health and PA on child-parent

encouragement. As in the initial models, parents' encouragement of their child's PA continued to predict child's encouragement of their parents.

There were no significant interactions between parent PA and parent self-rated health or weight category in models predicting co-engagement in PA.

Discussion

Parents who are supportive of their child's PA and model healthy behaviors, through overt encouragement to do PA or co-participation in PA, are known to have a positive impact on their child's activity levels (Beets et al., 2010; Edwardson & Gorely, 2010). Fostering these supportive relationships among family members, and not solely from parents to children, may be a useful strategy for family and household-based PA interventions seeking to develop family environments that support and promote healthy activity levels. In this sample of Mexican–American parent–child dyads, only half were relationships in which parents encouraged their children to do PA, while in one fifth of dyads children also encouraged their parents to be active. Less than one in five dyads were physically active together. Given the low prevalence of PA and high incidence of PA-related chronic disease in this community (Flegal et al., 2010; Ogden et al., 2010; Ong et al., 2008; Park et al., 2003), promoting joint activities and relationships that are supportive of PA among family members who share disease risk is vital.

The results of the current study indicate that encouragement to do PA was a highly reciprocal phenomenon, in that a strong predictor of parents or children providing encouragement was whether or not encouragement was also received from the other member of the parent–child dyad. In particular, children were unlikely to encourage parents who did not encourage them. Not surprisingly, this mutual encouragement among parents and children was also strongly predictive of co-engagement in PA, while unilateral encouragement (from the parent to child *or* child to parent) was not. In line with the communal coping model (Afifi et al., 2006; Lyons et al., 1998), cooperative action among family members may be more successful in achieving behavior change than individual initiatives because it is underpinned by shared health goals and reinforcing relationships. Additional longitudinal research is needed to determine why reciprocal encouragement and co-engagement in PA tend to co-occur in this community, and whether mutual encouragement can indeed instigate joint activity among family members. If so, increasing the extent to which parents and children both encourage each other to be physically active—which was found in only 15.2 % of dyads in the current sample—could be a valuable intervention strategy that promotes a communal coping process.

Informed by an ecological, network-based perspective of social influence within families, goals of the current report were also to identify characteristics of parents, children, relationships, and households that were associated with encouragement and co-engagement in PA among Mexican–American parents and children. Previous research has found that individual level factors (i.e., attributes of the parent or child) are associated with PA support (Alderman et al., 2010; Bauer et al., 2011; Laroche et al., 2009; Lee et al., 2010), however our findings suggest that characteristics of the parent–child relationship are also important.

The closeness of the parent–child relationship emerged as factor predicting PA support. Specifically, parents who reported being close to their children were substantially more likely to encourage their child to do PA, and were also more likely to participate in activities with that child. Closeness may foster these supportive relationships, and if so building strong connections among family members will be important for family-based PA interventions; particularly given that almost half of these parent–child dyads were not defined as ‘close’ by parents in this sample. Children who lack close parental relationships may also receive little encouragement to do PA, or lack healthy behavior models due to less joint activities, and so may be particularly vulnerable to developing inactive lifestyles (Beets et al., 2010; Edwardson & Gorely, 2010).

At the dyad level, gender heterogeneity was also associated with co-participation in PA. As shown in previous research, parent and child gender are associated with the provision and type of PA support (Beets et al., 2010), and findings here show that although gender was not associated with encouragement, father-daughter dyads were less likely to engage in activities together. In this population, it may not be the gender roles of the parents or children that are especially important, but the dynamics between father-daughter dyads that hinder joint activities. Initiatives seeking to foster co-engagement in PA among family members should consider these relational factors, and look for culturally acceptable ways in which father-daughter dyads might be more active together.

Household factors, including ownership of the family home and car, and number of children in the household, were not related to parent–child encouragement or co-engagement in PA. These null findings suggest that strategies that promote support and communal coping in Mexican–American families may be equally effective across a range of household types. However, US acculturation was associated with parents being *less* likely to encourage their children to do PA. The relationship between acculturation and health among Latinos has been shown to be complex, with greater acculturation often associated with poorer health outcomes and behavior (Lara et al., 2005), but also associated with *increased* leisure time physical activity (Abraído-Lanza et al., 2005). It is plausible that acculturation may promote a stronger individualistic, rather than familial or communal health focus, thus increasing individual leisure time PA but not supportive relationships for PA among family members. Should longitudinal research show that parents’ encouragement of PA in their children is an important precursor to eliciting reciprocal encouragement and co-participation in activities, fostering parental encouragement for PA within more acculturated households will be an important consideration for interventions in this community.

A question of key importance to this study is whether individual health variables, and in particular PA, are associated with relationships of support and co-engagement in PA among parents and children. The literature strongly suggests that support provided by parents increases PA in their children (Beets et al., 2010; Edwardson & Gorely, 2010), in line with theoretical models outlining how social support, modeling, and facilitation can promote behaviors in others. Unfortunately, because we did not have measures of child PA we could not confirm this relationship in the study population. However, we were able to examine relationships between parent PA and the dependent relationships of interest, and found evidence that parent PA was associated with relationships of encouragement, but only when

parent health was taken into consideration. Increased activity in parents was associated with a tendency to encourage PA in children, but only among the 46 % of parents who reported being in good health. This effect was not found among parents in fair/poor health (37.8 %) or those in very good/excellent health (16.6 %). Children also seemed to respond to the PA levels and health status of their parents: their tendency to encourage inactive parents to do PA was dependent on the weight status of their parent and was significantly less likely among nonoverweight parents (vs. obese). It seems likely that children who recognize that their parent is inactive, and that they have a health threat such as obesity, respond by encouraging them to do PA. These findings are in line with research showing a similar response by children of Latino and African-American parents with diabetes (Laroche et al., 2009). Overall, these findings indicate that parents in good health with healthy behaviors seem more likely to encourage exercise in their children, while children seem prompted to encourage parents in poor health and with low activity. From a communal coping perspective, shifting perceptions of health risks to have a more family-oriented focus may be beneficial, as this theoretical framework suggests that shared appraisal of a health threat is likely to foster a collective response and increased joint activity among family members (Afifi et al., 2006; Lyons et al., 1998).

Perhaps surprisingly, parent PA was not associated with parent–child co-engagement in PA, indicating that active parents were no more likely than inactive parents to do joint exercise with their children. However, only 15 % of parent–child dyads in this sample engaged in activity together suggesting that initiatives should not only attempt to increase activity among sedentary parents, but should also actively promote co-engagement in PA for these parents *as well as* parents who are currently active but who are no more likely to share this activity with their children.

Finally, parents' weight status was also associated with their provision of PA support. Overweight parents were the least likely to encourage their children to do PA, although they were the most likely to co-engage in PA with their children. It is not clear why this group of parents (relative to nonoverweight and obese parents) tends to provide support via joint activities, but not through overt encouragement; additional research is needed to investigate the implications of this for family engagement in PA. Because parental influence on children's PA is likely to have the greatest positive impact when it occurs via multiple mechanisms, such as overt social support and behavior modeling, identifying barriers to these different processes is warranted.

This report focuses on baseline data and as such cannot test hypotheses about causality; however the results outlined above point to variables that are likely to be important considerations for future longitudinal research and intervention development. A further limitation is that we relied on parent reports of their own behaviors and health status (as opposed to objective measures of activity, BMI, and health), and that information about children and the parent–child relationship was based on information provided solely from the parent. It is possible that children would have a different perspective about the support they provide, or the quality of their relationships. As children were not recruited into this study, we also lacked information on their PA levels and health status; variables that also may impact these support dynamics. Finally, the study also relied on single-item measures

of encouragement and co-engagement in PA. Although these measures have demonstrated validity in the broader social networks literature (Marsden, 2005), we are limited in our ability to test their validity with the data available in this study.

Despite these shortcomings, the current paper contributes to our understanding of the prevalence of parent–child relationships in Mexican American families that support PA. The findings highlight that some children also play an active role in supporting their parents to be physically active, and seem to respond in particular to PA encouragement they receive, as well as their parent’s health and PA levels. As reciprocal parent–child encouragement was strongly related to co-participation in physical activities, increasing bi-directional support for PA in families and integrating a communal coping model for health threats appears to be a promising avenue for research and family-based interventions.

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Table 1

Characteristics of parents, children, households, and dyads

Variable	%	M (SD)
Dependent relational variables (N = 455)		
Parent encourages child PA	48.7	
Child encourages parent PA	19.6	
Reciprocal parent-child PA encouragement	15.2	
Parent-child co-engage in PA	16.7	
Parent attributes (N = 224)		
% male	46.4	
DICE acculturation scale		1.4 (1.5), range 0–6
Parent self-rated health		
Excellent/very good	16.6	
Good	45.7	
Fair/poor	37.6	
Parent weight category		
Nonoverweight	14.7	
Overweight	34.8	
Obese	50.4	
M (SD) minutes of PA per week		94.4 (82.9), range 0–225
Child attributes (N = 256)		
% male	49.6	
Age category		
5–11 years	28.9	
12–16 years	21.9	
17–20 years	49.2	
Dyadic attributes (N = 455)		
% dyad type		
Mother-daughter	26.8	
Mother-son	27.5	
Father-daughter	21.1	
Father son	24.6	
% close relationships	57.6	
Household attributes (N = 118)		
House and car ownership		
% don't own house or car	4.1	
% own home <i>or</i> car	26.8	
% own home <i>and</i> car	69.1	
Number of children 5–20 years old		2.2 (1.2), range 1–5

Table 2
Child, parent, household, and dyadic predictors of encouragement and co-engagement in PA

Predictor	Parent encourage child PA (439 dyads nested in 116 families)			Child encourage parent PA (439 dyads nested in 116 families)			Co-engagement in PA (429 dyads nested in 116 families)		
	OR	95 % CI	p	OR	95 % CI	p	OR	95 % CI	p
Intercept	.81	.44, 1.49		.17	0.08, 0.33		0.03	0.01, 0.14	
Parent weight									
Nonoverweight	0.91	0.35, 2.34	.838	1.07	0.32, 3.59	.915	1.82	0.47, 7.11	.389
Overweight	0.52	0.27, 0.99	.046	0.89	0.36, 2.19	.802	3.40	1.16, 9.94	.026
Obese (referent)									
Parent self-rated health									
Excellent/very good									
Good	ns			ns			ns		
Fair/poor (referent)									
Parent PA (30 min intervals)	ns			0.87	0.77, 0.99	.039	ns		
Child age group	ns			ns			ns		
Own home and/or car	ns			ns			ns		
DICE	0.80	0.65, 0.98	.035	ns			ns		
Number of children in household	ns			ns			ns		
Dyad type									
Father-son									
Father-daughter	ns			ns			0.42	0.16, 1.11	.080
Mother-son							0.07	0.01, 0.36	.002
Mother-daughter (referent)							0.63	0.28, 1.42	.262
Close dyad	2.39	1.35, 4.24	.003	ns			8.18	2.01, 33.34	.003
Parent encourage child PA	–	–	–	3.53	1.52, 8.21	.003	ns		
Child encourage parent PA	3.34	1.35, 7.90	.006	–	–	–	ns		
Reciprocal PA encouragement	–	–	–	–	–	–	5.41	1.82, 16.10	.002

Statistically significant effects ($p < .05$) are in bold

ns not statistically significant

Table 3
Main effects and physical activity-health interactions predicting encouragement and co-engagement in PA

Predictor	Parent encourage child PA (439 dyads nested in 116 families)			Child encourage parent PA (439 dyads nested in 116 families)			Co-engagement in PA (429 dyads nested in 116 families)		
	OR	95 % CI	p	OR	95 % CI	p	OR	95 % CI	p
Intercept	1.26	0.52, 3.09		0.13	0.06, 0.28		0.03	.01, .14	
Parent weight category									
Nonoverweight	0.93	0.35, 2.45	.926	3.63	0.56, 23.67	.177	1.82	0.47, 7.11	.389
Overweight	0.40	0.20, 0.81	.011	1.23	0.38, 3.97	.729	3.40	1.16, 9.94	.026
Obese (referent)									
Parent self-rated health									
Excellent/very good							ns		
Good	2.37	0.55, 10.27	.250						
Fair/poor (referent)	0.33	0.12, 0.94	.039						
Parent PA (30 min intervals)	0.91	0.74, 1.11	.350	0.96	0.81, 1.14	.663	ns		
Parent self-rated-health* parent PA									
Excellent/very good*PA	0.85	0.56, 1.30	.452	ns			ns		
Good*PA	1.42	1.07, 1.88	.015						
Fair/poor*PA (referent)									
Parent weight* parent PA									
Nonoverweight*PA	ns			0.60	0.37, 0.97	.038	ns		
Overweight*PA				0.85	0.65, 1.11	.223			
Obese*PA (referent)									
Child age group	ns						ns		
Own home and/or car	ns						ns		
DICE	0.78	0.63, 0.96	.020				ns		
Number of children 5–20	ns						ns		
Dyad type									
Father-son									
Father-daughter	ns						0.42	0.16, 1.11	.080
Mother-son							0.07	0.01, 0.36	.002
Mother-daughter (referent)							0.63	0.28, 1.42	.262

Predictor	Parent encourage child PA (439 dyads nested in 116 families)			Child encourage parent PA (439 dyads nested in 116 families)			Co-engagement in PA (429 dyads nested in 116 families)		
	OR	95 % CI	p	OR	95 % CI	p	OR	95 % CI	p
Close dyad	2.11	1.17, 3.81	.013				8.18	2.01, 33.34	.003
Parent encourage child PA	–			3.80	1.56, 9.28	.003	ns		
Child encourage parent PA	3.71	1.47, 9.35	.005				ns		
Reciprocal encourage PA	–						5.41	1.82, 16.10	.002

Statistically significant effects ($p < .05$) are in bold

ns not statistically significant