Ecological Contexts and Family Dynamics among Mexican American Families

by

Lorey A. Wheeler

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Graduate Supervisory Committee:

Kimberly A. Updegraff, Chair
Adriana Umaña-Taylor
F. Scott Christopher
Jenn-Yun Tein

ARIZONA STATE UNIVERSITY

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ABSTRACT

In the present research, elements of the intra- (i.e., family dynamics) and extra-family (i.e., characteristics of parents' occupations) contexts were examined in a longitudinal design as associated, broadly, with individuals' mental health, relationship quality, and future orientations among Mexican American families with adolescent offspring in two separate studies. The first study reviewed the utility of applying dyadic data methods to the investigation of family processes, explored the strengths three different analytic approaches (i.e., the actor-partner interdependence model, a two-intercept model, and a difference model), and applied them to the study of marital relationships (N = 246 marital dyads). Results revealed that spouses' marital negativity was related to their own somatic symptoms, whereas, spouses' somatic symptoms were associated with both their own and their partners' marital negativity, with some variations by approach. This study suggested the three analytic approaches, though designed to answer slightly different questions, yielded a similar pattern of results with several important differences. The second study utilized a person-centered approach to identify family-level patterns of both mothers' and fathers' objective occupational characteristics (i.e., self-direction, hazardous conditions, physical activity), as well as the larger sociocultural context of these patterns (N = 160 dual-earner families). Results revealed three distinct occupational contexts: *Differentiated High Physical Activity*, *Incongruent*, and *Congruent High Self-Direction*. Results indicated that families in the Congruent High Self-Direction profile had the highest levels of youth career aspirations, whereas, educational aspirations were

the highest among youth in both the Incongruent and Congruent High Self-Direction profiles. Youth-mother and -father conflict was highest in the Congruent High Self-Direction profile, and youth-father warmth was highest for families in the Differentiated High Physical Activity profile. This study suggested that Mexican American parents work in varied occupational contexts, and these contexts were differentially associated with family relationships and youth's orientations toward the future.

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INTRODUCTION

Family dynamics as embedded within larger social and cultural contexts are central to individual development, adjustment, and mental health (O'Brien, 2005). As Mexican Americans are culturally distinguished for valuing identification and closeness with family (Cauce & Domenech-Rodriguez, 2002), it would be expected that family dynamics are especially important for individuals in this cultural context. Considering that unique cultural and economic conditions shape Mexican American family dynamics and experiences (McLoyd, 1998) and that Mexican Americans are a large and growing population that makes up about 66% of Latinos in the US (U.S. Census Bureau, 2011), a specific focus on Mexican Americans is warranted. The majority of research on Mexican American families is focused on the considerable challenges they face (Umaña-Taylor, 2009), and there is a considerable lack of knowledge regarding the links between normative family dynamics, larger social structures, and individual functioning. The following two studies address these gaps by applying innovative methods to the study of ecological factors that are associated with individual psychosocial functioning among Mexican American families with adolescent offspring.

Scholars direct our attention to the need for the application of cultural-ecological perspectives (e.g., Bronfenbrenner, 1989; García Coll et al., 1996; Szapocznik & Kurtines, 1993) that recognize layers of overlapping contextual influences that shape functioning over time. These overlapping influences are embedded in nested systems with the most proximal being immediate social settings (e.g., family) of an individual that are distally impacted by larger social

structures (e.g., workplaces, cultural patterns; Bronfenbrenner, 1989). It is important to identify features of these contexts that foster or interfere with family dynamics and individual functioning (Bronfenbrenner & Morris, 2006). Furthermore, families include interdependent subsystems (e.g., parent-child, marital) that influence one another and have properties that go beyond individual subsystems (Cox & Paley, 2003). Identifying characteristics of the subsystems, as well as characteristics of the family as a whole, enriches research on associations between family dynamics and individual functioning. Consequently, this dissertation examined family dynamics (i.e., marital relationships, parent-child relationships), extra-family contexts (i.e., family profiles of occupational characteristics), and individual functioning (i.e., spouses' depressive symptoms, youth's future orientations) longitudinally in a two-study approach united by cultural-ecological perspectives (e.g., Bronfenbrenner, 1989; García Coll et al., 1996; Szapocznik & Kurtines, 1993) and family systems theory (Cox & Paley, 2003).

The emphasis of the first study was the interplay between the marital context and individual functioning among Mexican American couples. Theories of relational interdependency purport multilayered, reciprocal, and causal pathways that connect marital behavior and individuals' mental health (e.g., Huston, 2000; Kelly & Thibaut, 1978). These theories provide a foundation for other scholars to build on to make specific predictions about, for example, the direction of associations between marital quality and spouses' depressive symptoms. The marital discord model of depression (Beach, Sandeen, & O'Leary,

1990) asserts that marital quality predicts individuals' depressive symptoms, whereas, the stress generation model (Hammen, 1991) suggests the opposite. In Study 1, these competing perspectives inform the illustration of three longitudinal dyadic statistical models: the actor-partner interdependence model (Kenny, Kashy, & Cook, 2006), a two-intercept model (Wendorf, 2002), and a difference model (Newsom, 2002). Specifically, the reciprocal associations between spouses' marital quality and somatic symptoms (i.e., an indicator of depressive symptoms) were examined longitudinally, and spouse gender was tested as a moderating factor.

The focus of the second study was on links between the extra-familial context, defined as parents' objective occupational characteristics (e.g., physical activity, self-directed work), family relationships, and youth's future orientations over a 5-year period. Two perspectives of work-family linkages informed this study. First, this study drew on the premise of role stress theory that stress in one domain, such as work, may impact another domain, such as relationships at home (e.g., Bolger, DeLongis, Kessler, & Wethington, 1989). Second, as directed by Kohn and Schooler's (1982) work on occupational self-direction (i.e., work autonomy, complexity, and minimal supervision) as a socialization agent of behaviors that are generalized to life away from work, parents' self-directed occupations may positively influence family relationships and individual functioning. To explain the mechanism that links these work contexts with family dynamics and functioning, this study broadly draws on social-cognitive theory (Bandura, 1986) that purports that social experiences (e.g., parents' work

experiences) shape behavioral domains (e.g., parent-youth relationships) and outcomes (e.g., youth's future orientations) through internal cognitive processes. The bulk of the work-family literature has primarily focused on using variable-oriented approaches to explore the impact of single dimensions of work (either positive or negative) in isolation from one another, as compared to person-centered approaches that allow for the identification of patterns of different work characteristics (e.g., Magnusson, 1988). Thus, this study is one of the first to utilize a person-centered analytic approach (e.g., Magnusson, 1988) to examining mother-father profiles of objective occupational characteristics in their larger socio-cultural context and associations with parent-youth relationship quality and youth's future orientations.

This work has the potential to make key contributions to the study of individual and family functioning over the lifespan. First, this dissertation employs an ethnic-homogenous design (García Coll et al., 1996) with a sample that varies in cultural background and socioeconomic status that allows for the examination of within-group variability among Mexican American families on intra- and extra-familial factors associated with functioning. Second, few studies in the family and marital literatures have focused on couple dynamics or occupational profiles as linked to individual and family functioning among Mexican American families. Third, this work more fully captures the complex nature of associations between family experiences and individual functioning by focusing on the family as the unit of study and, thus, utilizing multiple family members' perspectives, as well, as both parents' objective measures of

occupational characteristics. Obtaining data from multiple sources, including self-reports and objective measures, reduces reporter bias, and provides a richer picture of the relationships at hand. Fourth, by employing rigorous statistical techniques and a longitudinal design, this dissertation increases the depth of knowledge about Mexican American family processes. In particular, it offers insights on the dyadic nature of links between marital negativity and spousal somatic symptoms, and the complexities in work-family linkages for dual-earner families. In conclusion, this dissertation enhances the current literature on the study ecological contexts, family dynamics, and individual functioning over the lifespan for Mexican American parents and youth, and provides important new directions for future research.

STUDY 1: ANALYTIC APPROACHES FOR STUDYING MARITAL AND FAMILY DYNAMICS USING LONGITUDINAL DYADIC DATA

Family relationships are significant for many aspects of individual development and functioning over the life span (Reis, Collins, & Berscheid, 2000). Scholars who are interested in marital and family relationship dynamics have long recognized the complexity and interdependent nature of these processes (Hinde, 1979). In this literature, theoretical frameworks and models that highlight the importance of interdependency, such as Huston's (2000) social ecology model of marriage and intimate relationships, encourage researchers to link constructs simultaneously at the individual- and dyadic-level. Empirical work highlights that much is gained from investigating relationship processes in this manner; for example, spouses' marital discord has deleterious individual and cross-spouse associations on depressive symptoms over time (e.g., Beach, Katz, Kim & Brody, 2003). However, researchers have been challenged by capturing interdependency, and there is a paucity of family research using dyadic analytic techniques, as advances in these techniques are recent. As such, the purpose of this paper was to be a resource for family researchers by illustrating longitudinal dyadic statistical approaches that facilitate answering relationship-process questions using recent advances in statistical methods (Fincham & Beach, 2010).

The goal of this study was to illustrate how longitudinal dyadic data analysis techniques can offer important opportunities to understand the nature and functioning of family relationship processes. Specifically, this paper illustrates three statistical techniques that incorporate varying multilevel structural equation

methods for analyzing dyadic data from relationships longitudinally: (a) the Actor-Partner Interdependence Model (APIM, Kenny et al., 2006), (b) a two-intercept model (Wendorf, 2002), and (c) a difference model (Newsom, 2002). This paper begins by identifying the strengths of each technique and then demonstrates their application using data on marital relationships and spouses' somatic symptoms. For simplification purposes, this study focused on methods for *distinguishable* dyads (i.e., members are considered to have a distinct role in the dyad and are identified by a nonarbitrary variable such as sex or social role; e.g., husbands and wives as distinguished by sex; for methods applicable to exchangeable dyads see Olsen & Kenny, 2006) and on longitudinal panel models (i.e., two waves of data).

This paper built on other primers on dyadic data analysis (e.g., Maguire 1999; Lyons & Sayer, 2005; Ackerman, Donnellan, & Kashy, 2011) by reviewing three longitudinal dyadic techniques that incorporate components of structural equation models (SEM) and answer both individual- and dyad-level research questions. Scholars in both the family (e.g., Cook & Snyder, 2005) and developmental (e.g., Furman & Simon, 2006) literatures utilize dyadic matched-pairs (i.e., data exists for both members of a dyad) designs that require taking into account clustering and nonindependence of observations. Despite the fact that dyadic matched-pairs designs present special analytic challenges, the application of techniques presented in this paper offers researchers opportunities to understand dyadic phenomena by utilizing appropriate statistical methods for longitudinal dyadic data that can be implemented in any SEM package. Another

advantage of longitudinal dyadic statistical techniques is that they allow researchers to move beyond examining, for example, relationship attributes (e.g., love, conflict) as reported by one partner. These techniques link individual attributes of partners (e.g., well-being) and/or dyad attributes (e.g., length of relationship) to relationship attributes as reported by both partners to be modeled at the individual level or the dyad level. Such approaches are congruent with calls for the use of sophisticated modeling of dyadic data to move past practices that either ignored or corrected for the nested nature of scores (Fincham & Beach, 2010).

Three Techniques for Analyzing Longitudinal Dyadic Data

Actor-partner interdependence model (APIM) approach. Within the field of human development and family studies, by far the most common conceptual and statistical model for dyadic data is the APIM (Kenny, 1994; Kenny et al., 2006), which integrates interdependence theory of personal relationships (Kelly & Thibaut, 1978) with appropriate statistical techniques for non-independent data. Specifically, the APIM estimates the mutual influence between dyad members in a relationship and assesses dyadic processes that cannot be measured with data from one partner in a dyad. In multilevel terms, the APIM includes individual-level measurement of the independent and dependent variables, and dyad-level measurement of patterns of influence within the relationship (Kenny & Ledermann, 2010). An assumption of the APIM is that nonindependence in dyads is due to the association between a person's independent variable with the

dependent variable of the partner (partner effect), adjusted for the association on his or her own dependent variable (actor effect).

The basic APIM can be used to estimate three different associations: actor, partner, and influence patterns. All associations are represented as regression coefficients in the model. The associations between individuals' own behaviors or traits and their own report of the relationship dependent variable are the actor effects (e.g., wives' marital negativity to wives' somatic symptoms). The associations between individuals' own behaviors or traits and their partners' report of the relationship dependent variable are the partner effects (e.g., wives' marital negativity to husbands' somatic symptoms). The patterns of influence within a relationship are defined as actor-only, partner-only, couple, or contrast pattern. The actor-only pattern provides evidence for an association between the independent and dependent variables of interest that are within-individual processes, as compared to the other patterns that reflect relationship-based processes. Specifically, for the actor-only pattern, an individual's independent variable is linked to his or her own dependent variable but not to his or her partner's dependent variable (e.g., wives' marital negativity to wives' somatic symptoms, only). For the partner-only effect, an individual's independent variable is linked to his or her partner's dependent variable but not to his or her own dependent variable (e.g., wives' marital negativity to husbands' somatic symptoms, only), which may imply a reactionary process at work in the relationship. For the couple pattern, there are both actor and partner associations that are statistically significant in predicting the dependent variables (e.g., wives'

marital negativity to wives' and husbands' somatic symptoms), and implies an additive process in the relationship. Lastly, for the contrast pattern, the partner and actor associations work in opposite directions, for example, an individual's dependent variable is positively linked to his or her own independent variable and is negatively linked to his or her partner's independent variable (e.g., wives' marital negativity positively linked to wives' somatic symptoms and negatively linked to husbands' somatic symptoms). This may suggest either a competitive or a compensatory process in the relationship.

To apply the APIM technique (see Table 1), three steps are used that include estimating a series of SEM models to determine the actor, partner, and influence patterns. In all three steps, the interdependence between dyad members' data is accounted for by including correlations among the dyad members' independent and dependent variables, respectively. *Step 1* includes estimating a saturated model (i.e., no degrees of freedom left in the model) where the actor (a_1 = husbands' marital negativity to husbands' somatic symptoms, and a_2 = wives' marital negativity to wives' somatic symptoms) and partner (b_1 = husbands' marital negativity to wives' somatic symptoms, b_2 = wives' marital negativity to husbands' somatic symptoms) effects are freely estimated across dyad members (see Figure 1a). This model is used (a) to test for the equality of means of the dependent variables (i.e., constraining the means of Y_1, husbands' somatic symptoms, and Y_2, wives' somatic symptoms, to be equal and comparing to the saturated model with a chi-square difference test), and (b) to determine if the actor effects are nontrivial as the APIM approach assumes the actor effects to be

substantial (e.g., a simple rule of thumb, standardized regression coefficients > .10; Kenny & Ledermann, 2010). The actor effects need to be nontrivial for the *k* parameters (i.e., quantification of patterns of influence) to be stable. If the actor effects are trivial, the *k* parameter cannot be estimated.

Step 2 includes testing for distinguishability between dyad members (i.e., no husband and wife differences on any of the terms in the model; see Figure 1b). First, a model is estimated by simultaneously fixing the two actor (a_1) and two partner paths (b_1) to be equal using liberal alpha of .2 and a null hypothesis that the two unstandardized regression coefficients are equal. Using a chi-square difference test, this constrained model is compared to the final model from Step 1. If this model fits better than the model from Step 1, then a model in which all of the terms in the model are constrained across dyad members is estimated. This model is known as the "indistinguishable members" model. The indistinguishable members model includes the following six equality constraints: (a/b) equal means and variances of the independent variables, (c) equal intercepts of the dependent variables, (d) equal error variances, (e) equal actor paths, and (f) equal partner paths. If this model fits better than the previous model, then dyad members are treated as being empirically indistinguishable.

Step 3 includes estimating the model that includes the *k* parameter (k_1, k_2; see Figure 1c), which equals the partner effect (b_1) divided by the actor effect (a_1). The *k* parameter is estimated by using phantom latent variables (i.e., latent variables without substantive meaning and disturbance terms; P_1, P_2; see Figure 1c) to force linear constraints on the model. These constraints allow for the

quantification of the pattern of influence as the partner effect divided by the actor effect, and statistically tests of this pattern as equal to 0, 1, or -1. To evaluate these effects, first two models are estimated to determine if the *k* parameter should be constrained across partners. Then, models are estimated constraining the *k* parameter to 0, 1, or -1 to determine which influence pattern applies to the data. If the model with the *k* parameter constrained to 1 fits best, this indicates the couple pattern; if –1, the contrast pattern; if 0, the actor pattern. Kenny and Ledermann (2010) do not operationalize the partner-only pattern.

For researchers interested in examining interdependence, bidirectional associations, and patterns of influence (e.g., who has more influence on whom) in relationships as guided by, for example, Huston's (2000) social ecology model of marriage and social exchange theory (Emerson, 1976), this approach to dyadic data analysis has distinct advantages. First, the greatest advantage of the APIM is the ability to measure and confirm dyadic patterns of influence within a relational context. For example, research questions pertaining to mutual influence as compared to individual influence within couples can be answered using this model. Additionally, the APIM can be used in many analytic situations, including time-series, cross-lag, and growth analyses. Other advantages include the accessibility, flexibility, and ease of implementation, as it can be implemented in SEM and hierarchical linear modeling (HLM) packages and statistical programs such as SPSS and SAS.

Two-intercept approach. Wendorf (2002) presents a statistical model for dyadic data developed within a multilevel modeling framework. Wendorf extends

a two-intercept model (i.e., each dyad member has a separate regression equation within the same model to control for the dependence of observations; Barnett, Marshall, Raudenbush, & Brennan, 1993; Raudenbush, Brennan, & Barnett, 1995) by translating it into a structural equation approach to examine couple data. In accord with the two-intercept model, Wendorf's model includes an individual-level model in which each dependent variable (e.g., husbands' somatic symptoms, wives' somatic symptoms) is represented as a function of "true scores" for each dyad member plus measurement error. This model extends the two-intercept model by incorporating latent factors in a structural equation measurement model (i.e., links the measured items that make up the scales of husbands' and wives' somatic symptoms to create a set of latent factors that represent husbands' and wives' somatic symptoms accounting for error). Similar to the two-intercept model, Wendorf's dyad- or family-level model represents dyad members' true scores as dependent variables predicted by a set of explanatory variables in a structural model. This model can also incorporate family-level (e.g., family poverty) explanatory variables. Nonindependence of observations is captured by including the correlation between the dependent variables' (e.g., husbands' and wives' somatic symptoms) errors.

To apply Wendorf's (2002; see Table 1) approach to analyzing dyadic data with two steps. *Step 1* includes estimating an unconditional or measurement model that is estimated to confirm the latent factor ($\eta_{1,}$ husbands' somatic symptoms, and η_2, wives' somatic symptoms) structure of both dyad members' dependent variables ($Y_1 - Y_{14}$; husbands' items 1-7 and wives' items 8-14) and

measurement errors (ε_1 - ε_{10}; see Figure 2a). This model is specified to estimate the measurement model that includes dyad-level random effects (e.g., between dyad variance; ψ_1, ψ_2), at the exclusion of predictors and covariates. *Step 2* includes estimating a conditional or structural model that predicts outcomes (e.g., husbands' and wives' somatic symptoms) for each dyad member. This prediction model includes explanatory variables (ξ_2, husbands' marital negativity, ξ_3, wives' marital negativity), regression coefficients ($\beta_1 - \beta_6$; e.g., family poverty to husbands' somatic symptoms), and the latent dependent variables (η_1 = husbands' somatic symptoms, η_2 = wives' somatic symptoms; see Figure 2b). This model is specified to estimate the mean structure (i.e., means of the somatic symptoms' items constrained to 0 to allow the estimation of the means of the somatic symptoms' factors) and allows correlations between independent (e.g., marital negativity and family poverty) and dependent (e.g., somatic symptoms) variables, respectively. One can incorporate a full measurement model for covariates, but for illustration purposes, a measurement model was not incorporated; these variables can either be assumed to be measured without error (Bryk & Raudenbush, 1992) or modeled as single indicator latent variables with errors fixed at alpha to take into account measurement error. The independent variables are correlated with each other.

This approach is particularly useful for researchers interested in both individual-level and dyad-level predictors of individual-level dependent variables. This approach answers questions pertaining to individual outcomes (e.g., how is marital negativity associated with husbands' and wives' somatic symptoms?) in

the context of the dyad while controlling for within-dyad (dyadic) dependence of observations (e.g., interdependence or homogeneity). This model is similar to the APIM approach in that the dependent variables are predicted at the individual level from each dyad member's independent variable, *but different in that it includes estimates of measurement error*. Similar to the APIM, this model estimates actor and partner associations (i.e., individual-level), but *different* in that it also includes dyad-level effects (i.e., family-level) and incorporates measurement error into the model as it incorporates both dyad members' data points from matched-pairs designs. This is important as most family researchers' instruments include some degree of measurement error, which produces bias in regression coefficients (McDonald, 1999). The SEM approach to this model offers researchers more information than testing hypotheses using regression-based models.

Difference approach. Newsom (2002) extended work on statistical techniques used for longitudinal analysis of individual growth curves (e.g., Bryk & Raudenbush, 1987) to propose a statistical model for dyadic data analysis within the multilevel regression framework. Similar to growth curve models, this approach employs the use of intercepts and slopes to allow for tests of multilevel hypotheses about dyads. Specifically, this model provides a test of whether, on average, there is a difference between dyad members on the dependent variable (i.e. intercept parameter) and if this difference varies significantly across dyads (i.e., slope parameter). The difference model (see Figure 3) can incorporate predictors for each member at the individual-level or dyad-level.

To apply Newsom's (2002) approach, there are two steps (see Table 1). *Step 1* includes estimating an SEM configured to include two latent variables, an intercept and a slope, along with two indicators (e.g., husbands' and wives' somatic symptoms), and the mean structure is estimated to obtain the average intercept and slope (see Figure 3a). In this model, the latent intercept is defined by fixing the loadings of the two dependent variable indicators (e.g., husbands' and wives' somatic symptoms) to 1. In the dummy coded model, the latent slope is defined by fixing one of the loadings to 0 and the other to 1, and in the effect coded model it is defined by fixing the loadings to -.5 and .5 (i.e., produces a grand-mean centered solution). It is not possible to estimate variances (i.e., random effects) for the intercept and slope simultaneously in the difference model due to identification issues; thus, the slope variance is often constrained to be 0. Then, separate models are estimated to determine if the slope or intercept variance (and the covariance between the slope and intercept) should be fixed to 0. Chi-square difference tests are used to determine which model (i.e., slope variance = 0 or intercept variance = 0) fits better. In this approach, the average intercept represents the average score on the dependent variable for the dyad member coded 0 (e.g., wives' somatic symptoms) when a dummy coding (0 and 1) scheme is used, and it represents the grand mean of all couples when effect coding (-.5 and .5) is used. The average slope represents the difference between dyad members on the dependent variable (e.g., somatic symptoms). The intercept variance indicates the standardized between-dyad variation. The within-dyad variation is reflected in the error terms constrained to be equal for the factor

indicators. *Step 2* includes estimating a model with predictors (e.g., husbands' and wives' marital negativity) and any covariates (see Figure 3b).

This technique is particularly useful for researchers interested in examining *differences between dyad members*. This approach answers very different substantive questions as compared to the other two approaches and allows flexibility in individual- and dyadic-level questions that can be tested. For example, researchers may be interested in examining separate husband and wife predictors of mean levels of marital negativity in the dyad, as well as, husbands' and wives' individual-level marital negativity levels. These different substantive questions can be tested using different coding schemes. For example, the use of dummy coding should give similar findings as the APIM and Wendorf's approach (i.e., estimate the model twice to get estimates for husbands and wives), whereas effect coding answers a very different substantive question (i.e., grand mean of the DV) and can be used to test couple-level questions. Thus, researchers using Newsom's (2002) model can include both individual-level and dyad-level predictors of individual-level and dyad-level dependent variables. As Newsom's (2002) model is embedded in the SEM framework, it allows for tests of model fit and comparisons between models, as well as the integration of other SEM features, such as growth curve analysis. The difference model allows for a flexible approach to analyzing dyadic data.

Substantive Example: Marital Negativity and Spouses' Somatic Symptoms

The above dyadic statistical techniques are illustrated by examining the reciprocal effects between spouses' somatic symptoms (i.e., an indicator of

depressive symptoms) and marital quality longitudinally. An association between marital quality (i.e., cognitive, behavioral, or affective quality of marriage) and spouses' depressive symptoms has been demonstrated in the literature on marital relationships (Proulx, Helms, & Buehler, 2007). There have been two prominent lines of research on the effects between depressive symptoms and marital quality. Researchers using the marital discord model of depression (Beach et al., 1990) found evidence that suggests that marital quality is a strong predictor of positive and negative well-being concurrently and over time (Proulx et al., 2007). Marital quality has been found to be lower among people with psychological and health problems (Kiecolt-Glaser & Newton, 2001; Whisman, 2007) and marital discord has been linked to the onset of psychological disorders and health conditions (e.g., Overbeek, Vollebergh, de Graaf, Scholte, de Kemp, & Engels, 2006; Whisman, Uebelacker, & Bruce, 2006). Alternatively, researchers using the stress generation model (Hammen, 1991) suggest that increases in depressive symptoms lead to decreases in marital quality, and in turn, further increases in depressive symptoms (Davila, Bradbury, Cohan, & Tochluk, 1997). Depressive symptoms and marital dissatisfaction have been found to be associated longitudinally (e.g., Beach et al., 2003). Thus, the models illustrated in this paper are useful in examining these individual and dyadic relationship processes.

It is also important to test the links between marital quality and spouses' depressive symptoms for both husbands and wives. Indeed, a recent meta-analysis identified gender as moderator of the association between marital quality and depressive symptoms (Proulx et al., 2007). For example, there is evidence that

marital *status* (i.e., married or not) has a stronger effect on mortality and health for men, whereas marital *quality* has a stronger effect for women (e.g., Loving, Heffner, Kiecolt-Glaser, Glaser & Malarkey, 2004; Saxbe, Repetti, & Nishina, 2008). There is also a need to explore crossover effects between spouses' marital quality and depressive symptoms (e.g., Beach et al., 2003).

As there is a lack of racial and ethnic diversity in research on marital processes (e.g., Fincham & Beach, 2010), the current study contributes by examining these processes within long-term marriages among Mexican American families with adolescent offspring. Marital conflicts often increase when adolescents are present in the home (Hatch & Bulcroft, 2004), thus, this period of childrearing may be an important time to explore marital negativity and somatic symptoms. For illustrative purposes, somatic symptoms were chosen as an indicator of depressive symptoms and marital negativity was chosen as an indicator of marital quality. Furthermore, because economic strain has been associated with marital negativity (e.g., Conger, Elder, Lorenz, Conger, Simons, Whitbeck, Huck, & Melby, 1990) and depressive symptoms (e.g., Parke et al., 2004), family poverty was included as a control variable.

Method

Participants

Data were drawn from a larger longitudinal study of family socialization and adolescent development in Mexican American families (N = 246; Updegraff, McHale, Whiteman, Thayer, & Delgado, 2005). Eligible families included those with a biological mother of Mexican descent, a biological or long-term adoptive

father, and two adolescent siblings (i.e., a 7th grader and at least one older sibling). Given the study requirements of two-parents both living long-term with two siblings, families were recruited at a point where divorce would not necessarily be expected. The family members all had to be living together and fathers were working for pay at least 20 hours per week (given that the larger study focused on how parental work dynamics relate to family processes). Although not required for participation, 93% of fathers also were of Mexican descent. Two-parent families were chosen so that the roles of both spouses in family dynamics could be examined.

Participating families were recruited from schools in and around a southwestern metropolitan area. Letters were sent to 1,856 families. The contact information of 396 families (21%) was incorrect and attempts to find updated information were unsuccessful, and 146 families (10%) refused screening for eligibility. Of those eligible families (N = 421), 284 families (67%) agreed to participate, 95 families (23%) refused, and 42 families (10%) were unable to be reconnected with to determine if they would participate. Enrollment of families ended when home interviews were completed with 246 families, which surpassed the target sample size of 240 families.

At Time 1 (T1), couples in the study were either legally married (n = 228) or living in a consensual union as if legally married (n = 18). In Mexico marital unions commonly referred to as consensual unions, or common-law marriages in the United States, are publically recognized and De Vos (1999) suggested that unions of couples from these countries be considered a marriage if the union has

persisted for at least 5 to 10 years. In this sample, spouses had been together for an average of 18.89 years (*SD* = 4.98). No differences in background characteristics emerged between the two groups of couples. In the county from which the sample was drawn, two-parent Mexican-headed households were the most common family type (67.8%) and 18.6% of those families were living in poverty (U.S. Census Bureau, 2003), which is consistent with the current sample of which 18.3% met federal poverty guidelines. Families represented a range of education and income levels, from poverty to upper class, with a median family income of $40,000 for an average family size of 5.79 members. Spouses completed an average of 10 years of education (*M* = 10.34; *SD* = 3.74 for wives, and *M* = 9.88; *SD* = 4.37 for husbands) and were 40 years old on average (*M* = 39.00; *SD* = 4.63 for wives, and *M* = 41.70; *SD* = 5.76 for husbands). Most spouses were born in Mexico and completed interviews in Spanish (71% of wives and husbands), and wives and husbands had lived in the United States an average of 12.38 (*SD* = 8.86) and 15.18 (*SD* = 8.77) years, respectively.

Interviews were conducted five years later with over 75% of the original families [*n* = 184; here referred to as Time 2 (T2)]. Those who did not participate: could not be located (*n* = 43), had moved to Mexico (*n* = 2), could not presently participate or were difficult to contact (*n* = 8), or refused (*n* = 8). Non-participating families at T2 (*n* = 62), compared to participating families reported lower income (*M* = $37,632, *SD* = $28,606 vs. *M* = $59,517, *SD* = $48,395) and lower maternal education (*M* = 9.48, *SD* = 3.45 vs. *M* = 10.62, *SD* = 3.80) at T1. There were no other differences between T1 and T2 participants on demographic

variables for husbands or wives. At T2, 90% of couples continued to be either married (86%) or in a consensual union (4%), and 10% had a change in status (separated = 3%; divorced = 6%, and widowed = 1%). Divorced couples were not remarried at the time of the interview.

Procedures

The same procedures were used at each wave of data collection. Trained bilingual interviewers collected data in separate home interviews in spouses' preferred language (either English or Spanish). At the beginning of the interview, interviewers obtained informed consent. Due to variability in reading abilities, interviewers read questions aloud and entered responses into a laptop computer. Home interviews averaged between 2 to 3 hours in duration. Families were given a $100 honorarium for the interviews at T1 and $125 at T2. The University's Institutional Review Board approved procedures, including the use of consents and assents (see Appendix A).

Measures

Two translators familiar with the local Spanish dialect using the method outlined by Foster and Martinez (1995) forward and back translated all measures. Cronbach's alphas for all measures were comparable for English- and Spanish-speaking spouses; thus, for efficiency, all alphas were reported for the overall sample.

Background characteristics. At T1, spouses reported on household income, number of adults and children living in the household, and number of years they had been married or together as if married. A measure of family

poverty was created by creating a ratio from household income and census poverty thresholds from 2002 and 2003 (as applicable to cohorts across time). High scores indicate relatively greater family wealth.

Somatic symptoms. Spouses reported on the somatic symptoms subscale of the Center for Epidemiological Studies Depression Scale at both T1 and T2 (CES-D; Radloff, 1977). The factor structure of this measure has been validated with a sample of Mexican Americans (Golding & Aneshensel, 1989). Respondents rated the frequency that each of seven symptoms occurred on a 4-point scale in the past month (1 = *Rarely or none of the time,* 4 = *Most of the time*). The scale was created by meaning items separately for each spouse, with high scores indicating higher levels of somatic symptoms. Cronbach's α = .75 and .71 at T1 and .77 and .78 at T2 for wives and husbands, respectively.

Marital negativity. As an indicator of marital quality, spouses reported on marital satisfaction negativity at T1 and T2. The negativity scale of Braiker and Kelley's (1979) Relationship Questionnaire was used to measure spouses' feelings of negative (5-items) emotional aspects within the marriage. Participants answered questions on a 9-point scale with higher scores indicating more negativity (e.g., "How often do you feel angry or resentful towards your spouse?"). Few measures of marital quality, including these subscales, have been validated in Latino samples, although recent work with the current sample demonstrated support for validity of this scale with Mexican Americans (Wheeler et al, 2010). In this sample, α's = .68 and .69 at T1, and .76, and .72 at T2, for wives' and husbands' negativity, respectively.

Results

The results are organized around each of the dyadic data approaches illustrated in this paper (see Table 1 for a list of steps and Figures 1a-1c, 2a-b, and 3a-c for conceptual models). Within each approach, results from the models predicting T2 husbands' and wives' reports of somatic symptoms from T1 husbands' and wives' reports of marital negativity are detailed first. The results from the second set of models predicting T2 marital negativity from T1 somatic symptoms follow.

Mplus 6.11 (Muthén & Muthén, 2008-2010) was used to estimate all models from a data set configured in the "repeated measures" format (i.e., each record in the data set contained variables with different names for both members of the dyad). Full information maximum likelihood (FIML) estimation was used to adjust for missing data that were assumed to be missing at random (MAR). Auxiliary variables (i.e., T1 family poverty and years married, T1 measures of T2 dependent variables, and T2 marital status) were included to improve estimation under conditions of missing data (Enders, 2010). Fit of models that are not saturated (i.e., models have remaining degrees of freedom) was assessed with the chi-square statistic, root mean square error of approximation (RMSEA $\leq .05$), the comparative fit index (CFI $\geq .95$), and standardized root mean square residual (SRMR $\leq .08$). These particular fit indices are suggested as a good combination to assess the fit of models with small sample sizes (e.g., $N < 250$; Hu & Bentler, 1999). Correlations and descriptive statistics for all study variables are reported in Table 2.

Actor-partner interdependence model (APIM) approach. The APIM, as detailed previously and by Kenny and Lederman (2010), was used to estimate the associations between (a) T1 marital negativity and T2 somatic symptoms, and (b) T1 somatic symptoms to T2 marital negativity. Correlations between the independent variables (e.g., T1 husbands' and wives' marital negativity) and the errors of the dependent variables (e.g., T2 husbands' and wives' somatic symptoms) were included in the models to account for the interdependence between husbands' and wives' within couples.

Three steps were used that included estimating a series of models to determine the actor, partner, and pattern of influence associations (see Table 3 for fit indices and difference tests for each step). Starting with *Step 1*, for T2 *somatic symptoms* a saturated model was estimated. Model 1 was used to determine if the actor effects were nontrivial (i.e., *standardized* regression coefficients > .10), which they were. Of note, the actor coefficients needed to be nontrivial for the *k* term (see Figure 1c) to be stable and thus indicated that the *k* parameter could be estimated. Model 1 was also used to test for the equality of means of the dependent variables (i.e., constraining the means to be equal and comparing to the saturated model with a chi-square difference test, Model 1a). This step is not relevant to determining actor and partner effects, but to determine if there are mean differences on somatic symptoms. The test of equality of somatic symptoms means across husbands and wives was not statistically significant, and indicated that the T2 somatic symptoms means did not differ significantly by gender (see Table 3, M_{1a} vs. M_1).

Step 2 tested for distinguishability between partners (i.e., partner differences on any of the terms in the model). First as suggested by Kenny and Lederman (2010), a model was estimated that included simultaneously fixing the two actor paths to be equal to one another and the two partner paths to be equal to one another using a null hypothesis that the two unstandardized regression coefficients are equal (Model 2). Using a chi-square difference test, this constrained model (i.e., Model 2) was compared to the final model from Step 1 (i.e., Model 1a in Table 3). In comparing Models 2 and 1a, the chi-square difference test was not significant indicating that husbands and wives were indistinguishable on the two actor and two partner paths (see Table 3, M_2 vs. M_{1a}). As there were no significant differences between Model 2 and Model 1a, Model 2 was adopted, because it was more parsimonious. The next step then was to estimate a model in which all of the terms in the model were constrained across partners and is represented as Model 2a in Table 3. Model 2a is known as the "indistinguishable members" model (see Figure 1b). The indistinguishable members model included the following six equality constraints: (a/b) equal means and variances of the independent variables, (c) equal intercepts of the dependent variables, (d) equal error variances, (e) equal actor paths, and (f) equal partner paths. Next, Model 2a was compared to Model 2 to determine if the dyad members can be treated as being empirically indistinguishable. The chi-square difference test was significant indicating that husbands and wives were distinguishable on one or more of the six parameters constrained (see Table 3, M_{2a} vs. M_2). To investigate where the difference was, each constraint not

previously tested (e.g., equal error variances) was relaxed. Upon testing each constraint in Model 2b, husbands and wives were determined to be indistinguishable on all parameters except for the T1 marital negativity mean as indicated by the result of the non-significant chi-square difference test comparing Model 2 to Model 2b, in which Model 2b constrained everything except for the marital negativity means of husbands and wives (see Table 3, M_{2b} vs. M_2).

Step 3 estimated the model that estimated the *k* parameter using Model 2b as the initial model. The auxiliary command was not used in this step as bootstrapping (i.e., 5000 bootstrapped samples) was used in the estimation of the *k* parameters. First, two models were estimated to determine if the k parameters should be constrained across partners. Results of a chi-square difference test indicated that there were no differences by gender for the *k* parameter (see Table 3; M_{3a} vs. M_3), and thus it was constrained in the following models. Second, models were estimated constraining the *k* parameter to first 0 (i.e., actor influence pattern), then 1 (i.e., couple influence pattern), then -1 (i.e., contrast influence pattern) to determine which influence pattern best applies to the data. Chi-square difference tests indicated that the k parameter = 0, indicating the actor pattern, should be adopted as the final model (see Table 3; M_{3b} vs. M_{3a}, M_{3c} vs. M_{3a}, M_{3d} vs. M_{3a}).

Results suggested that Model 2b was the most optimal model (see Table 3) and explained a significant amount of variance in T2 somatic symptoms (see Table 4 and Figure 4). There was a significant actor path indicating that spouses' T1 marital negativity was positively associated with their own T2 somatic

symptoms across both husbands and wives. Results from Step 3 indicated that there was a significant actor dyadic pattern of association between marital negativity and somatic symptoms (see Table 3, Model 3b); thus, spouses' own marital negativity was significant only for their own somatic symptoms over time. Conversely, spouses' somatic symptoms were not associated with their partners' marital negativity.

Turning to T2 *marital negativity*, the *Step 1* chi-square difference test comparing Model 1 and 1a was not statistically significant (see lower half of Table 3, M_{1a} vs. M_1). This indicated that the T2 marital negativity means did not differ significantly by gender. The actor effects were also determined to be nontrivial (see Table 5). The results from the chi-square difference tests from *Step 2* indicated that husbands and wives should not be treated as indistinguishable (see lower half of Table 3, M_2 vs. M_{1a}). In particular, in comparing Models 2 and 1a, the chi-square difference test was significant indicating that husbands and wives *were distinguishable* on the two actor and two partner paths. Thus, husbands and wives were treated as distinguishable. As Model 1a was the final model, it was used in *Step 3* to estimate the *k* parameter. Results of a chi-square difference test indicated that there were no differences by gender on the *k* parameters (see lower half of Table 3; M_{3a} vs. M_3), and thus the *k* parameters were constrained across husbands and wives in the models determining the influence pattern. Chi-square difference tests resulted in the *k* parameter = 1 (i.e., the couple pattern) being adopted as the final model (see lower half of Table 3; M_{3b} vs. M_{3a}, M_{3c} vs. M_{3a}, M_{3d} vs. M_{3a}).

Results suggested that Model 1a was the most optimal model (see lower half of Table 3) and explained a significant amount of variance in husbands' and wives' T2 marital negativity (see Table 5 and Figure 5). There were significant actor paths for husbands and wives indicating that spouses' T1 somatic symptoms were positively associated with their own T2 marital negativity. There was also a significant partner path for husbands indicating that husbands' T1 somatic symptoms were positively associated with wives' T2 marital negativity. Results from Step 3 suggested a significant partner dyadic pattern of association between somatic symptoms and marital negativity (see the lower half of Table 3, Model 3c), indicating that for both husbands and wives, marital negativity is associated with their own and their partners' somatic symptoms over time.

In summary, spouses' marital negativity was positively related to their own, but not their partners', somatic symptoms five years later, with tests for gender indicating no differences between husbands and wives. Marital negativity as a precursor to somatic symptoms was an individual level process in that there was not mutual influence among spouses. Furthermore, spouses' somatic symptoms were also positively associated with their own and, for husbands, their wives' marital negativity five years later. Husbands and wives were significantly different in that wives' somatic symptoms were not associated with their husbands' marital negativity and the association between somatic symptoms and marital negativity was stronger for wives than for husbands. Somatic symptoms as a precursor to marital negativity is a dyadic process in that spouses' influence their own and their partners' marital negativity.

Two-intercept approach. Next, the two-intercept 2-step approach was used as detailed previously and by Wendorf (2002) to estimate the associations between T1 marital negativity and T2 somatic symptoms, as well as the reciprocal associations (i.e., T1 somatic symptoms predicting T2 marital negativity), with family poverty as a control variable. Starting with the results for T2 *somatic symptoms*, *Step 1* included estimating an unconditional or measurement model that confirmed the latent factor structure of both spouses' dependent variables and measurement errors, which were correlated for each item between spouses (e.g., wives' item 1 correlated with husbands' item 1) to account for the nested nature of the data. This model also estimated the measurement model, as well as the dyad-level random effects (e.g., between dyad variance), at the exclusion of the predictors and covariates. The unconditional measurement model had adequate fit, $\chi^2(81) = 106.71$, $p = .04$, RMSEA = .04, CFI = .95, SRMR = .08. This model confirmed the structure of the T2 somatic symptoms factors for both spouses.

In *Step 2*, a conditional (i.e., structural) model was estimated that predicted T2 somatic symptoms from T1 marital negativity for each spouse by estimating a prediction model that included explanatory variables, regression coefficients, and the latent dependent variables. This model estimated the mean structure (i.e., means of the indicators of the factors constrained to 0 to allow the estimation of the means of the factors) and allowed correlations between the independent and dependent variables, respectively. This model also had adequate fit, $\chi^2(117) = 159.67$, $p = .01$, RMSEA = .04, CFI = .92, SRMR = .07, and explained significant variation in husbands' and wives' T2 somatic symptoms

(see Table 4 and Figure 4). For both husbands and wives, T1 marital negativity was positively associated with their own T2 somatic symptoms. Additionally, wives' T1 marital negativity was positively associated with husbands' T2 somatic symptoms. There were no other significant associations.

Moving to T2 *marital negativity*, the unconditional measurement model had adequate fit, $\chi^2(36) = 63.61$, $p < .01$, RMSEA = .06, CFI = .92, SRMR = .11. To improve model fit, a correlated error between items Y_{9w} and Y_{11w} (see Figure 2a) was estimated for wives as the items had similar wording. The structural model predicting T2 marital negativity from T1 somatic symptoms also had adequate fit, $\chi^2(60) = 92.06$, $p = .01$, RMSEA = .05, CFI = .91, SRMR = .09, and explained significant variation in wives' T2 marital negativity (see Table 5 and Figure 5). For wives, but not husbands, T1 somatic symptoms were positively associated with T2 marital negativity. Additionally, husbands' T1 somatic symptoms were positively associated with wives' T2 marital negativity. There were no other significant associations.

In summary, in predicting marital negativity to somatic symptoms five years later, husbands' and wives' marital negativity was positively related to their own somatic symptoms, and in addition, wives' marital negativity also was associated with their husbands' somatic symptoms. In contrast, in the models predicting somatic symptoms to later marital negativity, wives' somatic symptoms were related only to their own marital negativity, whereas husbands' somatic symptoms were associated only with their wives' marital negativity.

Difference approach. The difference approach was used as detailed previously and by Newsom (2002) to estimate the associations between T1 marital negativity and T2 somatic symptoms, and between T1 somatic symptoms and T2 marital negativity. In *Step 1* for T2 *somatic symptoms*, a measurement model was estimated with two latent variables, an intercept, and a slope, along with two indicators (i.e., T2 husbands' and wives' somatic symptoms); this model had adequate fit, $\chi^2(1) = .001$, $p = .978$, RMSEA = .00, CFI = 1.00, SRMR = .00. In this model, the mean structure was estimated to obtain the average intercept and slope. The latent intercept was defined by fixing the loadings of the two dependent variable indicators to 1. With dyadic data, a model with a random intercept and slope results in 1 too many parameters to be estimated given the number of covariance elements available, leading to identification problems. The model with the slope variance freely estimated did not converge and, thus, the slope variance and the intercept and slope covariance were fixed to 0. In the context of dyadic data, nonsignificant or near zero variance simply indicates there is little difference among groups on the slope, in this case. The measurement errors on the DVs were constrained across husbands and wives. Lastly, effect coding (i.e., husbands = -.5, wives = .5; grand mean centered solution) was used in this illustration to include a couple level variable in the models. Therefore, the intercept represented the group mean on T2 somatic symptoms and the slope represented the difference between husbands and wives on somatic symptoms.

Step 2 included estimating the structural model predicting the T2 intercept (i.e., somatic symptoms' group mean) and slope (i.e., difference between

husbands' and wives' on somatic symptoms) from T1 husbands' and wives' marital negativity. This model also had adequate fit, $\chi^2(1) = .03$, $p = .87$, RMSEA = .00, CFI = 1.00, SRMR = .01, and explained significant variation in the T2 somatic symptoms intercept (see Table 4 and Figure 4). There was significant within-dyad variation (i.e., residual for husbands' and wives' somatic symptoms), indicating greater variation within dyads than between dyads on T2 somatic symptoms. There was also a significant positive association between wives' T1 marital negativity and the T2 intercept (i.e., somatic symptoms grand mean). There were no other significant associations.

For T2 *marital negativity*, the measurement model had adequate fit, $\chi^2(1) = .06$, $p = .292$, RMSEA = .06, CFI = .92, SRMR = .11. The second step was to include the structural model predicting the T2 intercept (i.e., marital negativity group mean) and slope (i.e., difference between husbands and wives on marital negativity) from T1 husbands' and wives' somatic symptoms. This model also had adequate fit, $\chi^2(1) = .13$, $p = .72$, RMSEA = .00, CFI = 1.00, SRMR = .02, and explained significant variation in the T2 marital negativity intercept (see Table 5 and Figure 5). There was significant between- (i.e., intercept residual) and within-dyad variation (i.e., residual for husbands' and wives' marital negativity). For both husbands and wives, there were significant positive associations between T1 somatic symptoms and the T2 intercept (i.e., marital negativity grand mean). For wives, but not for husbands, there was also a significant positive association between T1 somatic symptoms and the T2 slope (i.e., difference between husbands' and wives' marital negativity), indicating that as wives' somatic

symptoms increased, the difference between husbands and wives on marital negativity increased, with husbands being higher on marital negativity than wives.

In summary, wives' marital negativity was positively related to couple-level somatic symptoms five years later. Husbands' and wives' somatic symptoms were also positively related to couple-level marital negativity five years later. Furthermore, as wives' somatic symptoms increased, on average, the difference between husbands' and wives' marital negativity increased.

Discussion

Scholars who are interested in marital and family relationship dynamics are often confronted with the challenge of characterizing the complex and interdependent nature of these processes. As illustrated in this paper, a dyadic approach to data analysis is one way to study the complexities in interpersonal relationships. This study outlined three approaches to dyadic data analysis specifically for distinguishable members within the flexible SEM framework. In particular, the actor-partner interdependence model (APIM), the two-intercept, and difference approaches offer researchers dyadic-analytic tools to investigate complex relationship processes that occur between members of a dyad over time. This study illuminated variations in model estimation, the types of questions that can be answered, and other differences among the approaches, but also illustrated the complementary nature of the findings that emerged from these approaches. It may be useful for researchers to use more than one approach as they each contribute unique information, leading to a greater understanding of family processes.

In the analyses of the associations from marital negativity to somatic symptoms, the results of all three analytic approaches suggested that there were positive associations between spouses' marital negativity and their somatic symptoms five years later. In particular, wives' marital negativity was a consistent predictor of future levels of wives', husbands', and dyadic levels of somatic symptoms. Thus, this study goes beyond previous work that has primarily examined associations between spouses' own marital and psychological functioning (e.g., Proulx et al., 2007) to highlight the influence of wives' marital quality on husbands' psychological functioning.

For the associations from somatic symptoms to marital negativity five years later, results of all three analytic approaches suggested that husbands' and wives' somatic symptoms played different roles in their marital negativity. When wives were depressed, the results suggested that it affected wives' but not husbands' marital negativity, and thus, the *difference* in spouses' marital negativity was larger five years later. In contrast, husbands' somatic symptoms predicted the dyads' average level of marital negativity, but not spousal differences because husbands' somatic symptoms were linked to higher levels of both spouses' marital negativity. This study extends prior research supporting the direction of effects from marital quality to psychological functioning (e.g., Proulx et al., 2007) by highlighting the importance of examining these constructs at the level of the dyad with the use of three dyadic-analytic approaches to reveal the implications of psychological functioning for future marital quality.

Practical Implications

As illustrated in the current study, all three dyadic approaches were informative substantively and analytically. Thus, for researchers interested in dyadic processes, recommendations highlight the practical implications of applying each analytic approach. First, the three approaches all answer slightly different dyadic research questions, which researchers should consider prior to choosing one dyadic analytic approach over another. In particular, the APIM and two-intercept approaches both answer research questions about interdependence as measured by the associations between dyad members' independent and dependent variables. Results from these two approaches most closely resembled one another; for example, with both approaches, husbands' and wives' marital negativity were associated with their own somatic symptoms. Thus, hypotheses regarding individual-level reciprocal associations between dyadic phenomena can adequately be examined using either the APIM or the two-intercept approach.

The APIM also answers questions of mutual influence, such as "Who has more influence on whom?" which the other two models do not answer. For example, the *k* parameter suggested that the association between husbands' and wives' T1 marital negativity and T2 somatic symptoms is an individual-based process and not mutually influenced, whereas the association between T1 somatic symptoms and T2 marital negativity is a dyadic process that may suggest the mutual influence of the partners' somatic symptoms on one another's marital negativity. For those researchers interested in mutual influence, the APIM has a

clear advantage, as the other two approaches are not able to directly test this type of hypothesis.

The difference approach answers quite different research questions pertaining to dyadic-level phenomena. For example, “What is the association between husbands’ and wives’ marital negativity with mean levels of somatic symptoms in the dyad?” As such, results from this approach revealed that only wives’ marital negativity was associated with couple-level somatic symptoms. Additionally, the difference approach, as compared with the other two approaches, is also useful in answering questions regarding differences between dyad members on phenomena such as marital negativity. In illustration, results from this study suggested that increases in wives’ somatic symptoms were associated with increased differences between husbands’ and wives’ marital negativity. Thus, researchers interested in examining phenomena at the level of the dyad or differences between dyad members will have more success in applying the difference approach over the other approaches.

Second, there were also important implications for applying the approaches with regard to the specification and estimation of the analytic models. Illustrations of the APIM (e.g., Kenny & Ledermann, 2010) and difference (e.g., Newsom, 2002) approaches in the current literature often have not included measurement error. Measurement error could be a possible explanation for differences in results across models. In particular, for somatic symptoms as related to marital negativity five years later, the direction of results were consistent across the APIM and two-intercept approaches but the significance

level of effects varied. Also in the APIM, husbands' somatic symptoms were positively associated with wives' marital negativity, whereas in the two-intercept approach, this association was a trend.

Conversely, the utility of the APIM approach over the other two approaches is that the basic model is much simpler to estimate. By including the estimation of latent variables and error structures, the two-intercept and difference approaches are less straightforward in model setup and have more possible estimation problems. Although for the APIM, when incorporating the estimation of the *k* parameter, the estimation process is more complicated with the inclusion of the phantom latent variable. Thus, for researchers concerned about or encountering estimation problems, the basic APIM approach is simpler than the other two approaches.

Third, another issue to consider is the level of the phenomena of interest. As presented to date in the literature, the two-intercept and difference approaches both can expand to include dyad-level predictors (e.g., family income) and, therefore, are analytically more flexible than the APIM approach. In contrast, the APIM approach makes the assumption that nonindependence in the data between the dyad members can be explained fully by the partner effect (i.e., a person's independent variable as associated with the dependent variable of the partner), adjusted for the actor effect (i.e., the association on his or her own dependent variable) to the exclusion of other explanatory variables. Thus, researchers interested in examining explanations of dyadic independence beyond the two

members (e.g., neighborhood context) should consider utilizing either the difference or the two-intercept approach.

The APIM and difference approaches both include parameters that represent dyad-level dependent (i.e., endogenous) variables. For example, the APIM approach incorporates the estimation of the *k* parameter that quantifies the amount of mutual influence within a dyadic process. As discussed previously, this study revealed that the prospective association between spouses' somatic symptoms to marital negativity seemed to be mutually influenced by both partners, whereas for spouses' marital negativity and somatic symptoms, mutual influence was not apparent. Thus, for those scholars interested in mutual dependence, the APIM approach has an advantage over the other approaches. Turning to the difference approach, it includes parameters that represent dyadic levels of the dependent variable as well as the difference between dyad members on the dependent variable. This approach, as compared to the other two, in this study revealed that both husbands' and wives' somatic symptoms were associated with couple-level marital negativity five years later. The difference approach is unique in this regard, and is a powerful approach for those interested in *differences* between dyad members. Thus, differences in estimation ultimately relate back to the research questions that can be answered by each approach and should be carefully considered prior to the choice of one approach over the others.

Limitations

As with any analytical method, these three approaches were not without their limitations. First, to some degree, measurement error was not addressed fully

in each of the models as illustrated in this paper and discussed previously. Although, the variables that were used in this illustration were highly reliable, measurement error can produce spurious results or obscure true associations between phenomena (McDonald, 1999). Second, in the APIM and two-intercept models there is the potential for method variance inflation of the actor effects as the independent and dependent variables were self-reports. Many statistical techniques can be used to adjust for this (see Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Furthermore, Van Dulmen and Goncy (2010) discuss methods of incorporating cross-reporter data into dyadic analytic techniques. Third, power may also be a concern in dyadic models because of the nonindependence of the data. As discussed by Ackerman and colleagues (2011), who specifically examined power in the context of the APIM, there is low power to detect partner effects. Researchers using dyadic designs should be aware of the issue of power and consider using traditional methods to increase it, such as a larger sample size.

Due to the scope of this paper, not all topics related to dyadic longitudinal data were covered. With respect to dyadic data, other analytic approaches can be used to answer other research questions about relationships. Some of these approaches correspond with other forms of dyadic nonindependence. One example is modeling data from interchangeable dyads – also known as exchangeable or indistinguishable dyads (i.e., there is no meaningful basis to assign individuals to certain roles in a dyad, such as same-sex twins or friends; e.g., Olsen & Kenny, 2006). These data present unique challenges and can be analyzed with the APIM approach with slight modifications, but cannot be easily

analyzed with the two-intercept or difference approaches presented here. Another example, the common fate model, allows for modeling group effects (e.g., dyad members' shared external factors such as neighborhood quality) as reflective constructs (i.e., two dyad members are similar to one another on a measured variable due to the influence of a shared latent variable) that are separate from and can be associated with individual effects (e.g., Lederman & Kenny, 2012). Lastly, the present study followed standard practices for missing data in longitudinal models (i.e., use of Full Information Maximum Likelihood estimation with auxiliary variables), but an extended discussion of missing data in longitudinal designs was beyond the scope of this paper (see Enders, 2010).

Conclusion

Researchers interested in dyadic relationships have many complementary analytic approaches available to them, each with their own strengths and weaknesses. Ultimately, the choice of any dyadic analytic strategy must be carefully considered as not every approach works well with every research question or phenomenon being studied. Although researchers should carefully consider the pros and cons of the particular approach they choose, the application of dyadic analytic techniques to the study of family and close relationships will offer important advances in our understanding of dyadic processes that occur in these contexts.

STUDY 2: THE ROLE OF MEXICAN AMERICAN FAMILY WORK CONTEXTS ON PARENT-YOUTH RELATIONSHIPS AND YOUTH FUTURE ORIENTATIONS

The work context has important implications for the quality of many aspects of family life (e.g., Perry-Jenkins, Repetti, & Crouter, 2000). Extant research suggests that parents' exposure to workplace conditions is linked to the quality of parent-youth interactions and youth adjustment (e.g., Greenberger, O'Neil, & Nagel, 1994; Ransford, Crouter, & McHale, 2008). Some dimensions of parents' work characteristics, such as occupational self-direction (e.g., autonomy, complexity, minimal supervision), are linked to positive family dynamics (e.g., Goodman, Crouter, Lanza, & Cox, 2008) and individual well-being (e.g., Parcel & Menaghan, 1994). Other dimensions (e.g., work stressors and pressure) are associated with problematic family dynamics (e.g., Crouter, Bumpus, Head, & McHale, 2001) and adjustment (e.g., Crouter, Davis, Updegraff, Delgado, & Fortner, 2006a). Despite the demonstrated importance of work-family connections, few studies have investigated the simultaneous associations of both positive and negative work characteristics for both mothers and fathers within diverse family and cultural contexts (Perry-Jenkins et al., 2000). The current study sought to address these limitations by examining associations of *patterns* of both mothers' and fathers' positive and negative occupational characteristics with parent-youth relationships and youth future orientations among a sample of Mexican American dual-earner families with two offspring.

In the face of changing demographic trends in the US (U.S. Census Bureau, 2011) very little is known about the impact of Mexican American parents' work contexts on family and individual functioning. In particular, Mexican Americans comprise the majority of the fastest growing US ethnic-minority group, a population composed disproportionately of working-poor families (U.S. Census Bureau, 2011). Mexican Americans, of whom 69% are in the labor force (U.S. Census Bureau, 2011), are overrepresented in unskilled labor positions (Mosisa, 2002) that have stressful environments with long hours and low wages (Crouter et al., 2006a). These work conditions are risk factors for diminished quality of family relationships, and, in turn, lower levels of youth adjustment with primarily European American samples (Conger, Rueter, & Conger, 2000). Yet, there is a paucity of research on *patterns* of parents' occupational characteristics as linked to family conditions that give rise to quality parent-youth relationships and youth's future orientations.

Drawing on an ecological framework (Bronfenbrenner & Crouter, 1982) and a person-oriented approach (Magnusson, 1988), the present study examined work-family linkages among Mexican American families over time. Given that little is understood about work-family connections among Mexican American families, ethnic-homogeneous designs are useful in conjunction with person-oriented approaches to identify within-group variations (García Coll et al., 1996; McAdoo, 1993). The first goal is to identify profiles of objective occupational characteristics of both mothers' and fathers' jobs along three dimensions: self-direction, hazardous conditions, and physical activity. The focus on profiles of

parental occupational characteristics extends prior, variable-oriented research that has examined single dimensions of maternal or paternal occupational attributes, while controlling for other dimensions. Grounded in ecological (Bronfenbrenner & Crouter, 1982) and cultural-ecological perspectives (García Coll et al., 1996; McAdoo, 1993), the second goal was to examine mothers' and fathers' sociocultural correlates (i.e., socioeconomic resources, nativity, years living in the US, acculturation) of the mother-father occupational profiles. The third goal was to explore the links between the occupational profiles in early adolescence with parent-adolescent relationship quality (i.e., warmth, conflict) and youth future orientations (i.e., academic, career) in late adolescence and early adulthood, and how these associations vary as a function of sibling birth order and developmental status. As elaborated below, the efforts to address this latter goal were grounded in a role stress perspective (e.g., Bolger et al., 1989) and social cognitive theory (Bandura, 1986).

Profiles of Mother-Father Occupational Characteristics

According to an ecological perspective, multiple macrosystems (e.g., economic, work) and components of these systems interact to shape the texture of daily life within families (Bronfenbrenner & Crouter, 1982). Scholars have identified parents' work contexts as an important macrosystem linked to family functioning (Belsky, 1984; Bronfenbrenner & Crouter, 1982). As research with Mexican American families has been limited, it is important to identify dimensions of work beyond status characteristics (i.e., employed versus not, work hours) that are salient for these families (Updegraff, Crouter, Umaña-Taylor, &

Cansler, 2007). As recognized in earlier work (Updegraff et al., 2007), the occupational characteristics of self-direction, hazardous conditions, and physical activity are particularly important for Mexican American parents who primarily work in service, sales, construction, and production positions (U.S. Census Bureau, 2011) that have long hours and low wages (Crouter et al., 2006a). Scholars have noted that the work-family literature has primarily included European American mothers (Updegraff et al., 2007) and either positive or negative assessments of work while controlling for other dimensions, with few studies examining patterns of multiple domains of occupational characteristics (Perry-Jenkins et al., 2000). In this study, a person-oriented approach (Magnusson, 1988) was used to identify profiles of multiple occupational characteristics of both parents' jobs. Applying a person-oriented approach to work-family research allows for the examination of patterns across mothers and fathers with special attention to how multiple occupational components are interrelated and mutually associated with family processes (Magnusson, 1988).

Based on prior research on Mexican American parents' occupational characteristics (e.g., Updegraff et al, 2007), it was hypothesized that several different mother-father patterns would emerge. As there is a paucity of research on Mexican Americans occupational characteristics, the first goal of identifying distinct family profiles of Mexican American mothers' and fathers' objective occupational characteristics was exploratory. It was hypothesized that similarities and differences in parents' occupations would explain some of the patterns that emerged. For example, when both parents' jobs are in low-skill occupations, high

levels of physical demands, and low levels of self-direction characterize families. Conversely, as there is much variation within cultural-groups as related to occupations (Nightingale & Fix, 2004), it was expected that dimensions such as self-direction may be most applicable to parents in skilled and professional occupations. Thus, it was hypothesized that a common pattern would emerge in which both parents were in occupations with high self-direction and low to moderate physical and hazardous demands. Lastly, it was hypothesized that a differentiated pattern would emerge within families, as not all parents have similar occupations.

As part of this goal, the objective occupational profiles were linked to parents' subjective job characteristics (i.e., hours, occupational prestige, and workplace discrimination). These job experiences are important sources of within-group variability that may characterize occupational profiles among Mexican American families (Updegraff et al., 2007). For example, workplace experiences with discrimination have been associated with employee's feelings about their jobs and job conditions in diverse samples (Hughes & Dodge, 1997, Roberts, Swanson, & Murphy, 2004, Sanchez & Brock, 1996), with different patterns emerging depending on prior work experiences (Sanchez & Brock, 1996). Thus, work hours, occupational prestige, and discrimination were used to describe the occupational profiles.

The Role of the Family and Cultural Context

Ecological (Bronfenbrenner & Crouter, 1982) and cultural-ecological perspectives (García Coll et al., 1996; McAdoo, 1993) highlight the importance of

the larger context within which family experiences are embedded. Exploring cultural variation in family environments provides a contextualized understanding of the specific patterns of family occupational characteristics. Scholars have recommended conceptualizing families' cultural contexts as multidimensional (Gonzales, Fabrett, & Knight, 2009), including multiple measures of mothers' and fathers' cultural backgrounds (i.e., socioeconomic resources, nativity, years living in the US, acculturation) to facilitate a more complete understanding of these contexts. This approach provides a direct test of how culture is associated with parental occupations in Mexican American families relative to comparative designs that make assumptions about ethnic differences that may be accounted for by other factors.

Researchers who study work-family linkages among Mexican American families have highlighted the importance of cultural backgrounds. Mexican American parents who are born in Mexico and are recent arrivals to the US, and thus less acculturated, may have more difficulties finding employment in skilled and professional positions as immigrants are over-represented in unskilled labor positions (Mosisa, 2002). Previous research has documented differences in occupational self-direction, which often characterizes professional positions. Spanish-speaking parents report less occupational self-direction than their English-speaking counterparts (Updegraff et al., 2007). Based on the limited research, the associations of socioeconomic resources, nativity, number of years in the US, and acculturation were hypothesized as correlates of the occupational profiles.

Mother-Father Occupational Profiles, Parent-Youth Relationships, and Youth Future Orientations

Scholars have proposed that parents' work environments are important extra-familial contexts that are linked to parent-youth relationships and youth development (Belsky, 1984; Bronfenbrenner & Crouter, 1982). Patterns of parents' occupational characteristics are important across developmental periods, but may be particularly salient during adolescence. During this time, parents and adolescents begin renegotiating their relationship, often including changes in levels of acceptance and patterns of communication (Collins, 1990), as well as, increased conflict (Steinberg, 2001). Moreover, the developmental task of identity exploration is becoming more salient during adolescence, and youth are beginning to consider and formulate aspirations for future educational and career plans (Markus & Wurf, 1987; Nurmi, 1991). Parents and adolescents may be particularly sensitive to both the positive and negative aspects of parents' work contexts because of the potentially turbulent nature of this developmental period. Below, the theoretical and empirical links of the patterns of parents' occupational characteristics with parent-youth relationship quality (i.e., warmth, conflict) and youth future orientations (i.e., academic, career) are considered, as well as how these associations vary as a function of sibling birth order and developmental status (late-adolescence and early adulthood).

Parent-youth relationships. There are two primary traditions that connect work to family in the literature: work socialization and work stress. First, the work socialization literature (e.g., Kohn & Schooler, 1982; Menaghan &

Parcel, 1995) is grounded in sociological theory. This literature is based on the premise that occupational characteristics, such as self-direction (i.e., complexity and low levels of supervision and repetition), shape workers' beliefs, values and world view, which in turn are applied to family processes, such as childrearing, which then influence children's social and cognitive development (Parcel & Menaghan, 1994). For example, mothers who worked in jobs that were low in complexity had poorer quality home environments than those who worked in jobs that were higher in complexity (Menaghan & Parcel, 1995). Occupational self-direction has also been linked with higher levels of parent-child relationship quality (Goodman et al., 2008; Menaghan & Parcel, 1991; Wheeler, Updegraff, & Crouter, 2011). Second, the work stress literature draws from both the clinical psychology and occupational health fields (Perry-Jenkins et al, 2000) as it investigates how work stress affects workers' behaviors and functioning outside of the work context. Role stress perspectives (e.g., Bolger et al., 1989) on the work-family interface suggest that stressful occupational characteristics may negatively influence parent-youth relationships through the negative influence of work on parents. In particular, studies have shown that stressful work conditions, such as hazardous and physically demanding conditions, are negatively associated with well-being for Latinos (Wheeler et al., 2011; Zimmerman, Christakis, & Stoep, 2004) and less warm and conflictual interactions between parents and adolescents (Galambos, Sears, Almeida, & Kolaric, 1995; Wheeler et al., 2011). Based on prior literature and theory, the links between mother-father occupational profiles with warmth and conflict in the parent-youth relationship were examined.

In families in which there was a congruent pattern of parents both working in occupations characterized by hazards and physical demands, lower levels of parent-youth warmth and higher levels of conflict were hypothesized relative to the other patterns.

Youth future orientations. During adolescence, identity exploration and preparation for adulthood are important developmental tasks that include the formation of aspirations for future education and work involvement (Nurmi, 1991). There is evidence that parents are a primary source of knowledge and beliefs about adult roles for adolescents (Bryant, Zvonkovic, & Reynolds, 2006). Social cognitive theory (Bandura, 1986) suggests that parents' work experiences are a model that adolescents may learn from and incorporate into their own orientations toward future academic and career plans. Furthermore, work contexts may shape parents' skills and attitudes that they then apply to the home environment (Kohn & Schooler, 1982) linking to socialization practices of parents (Bryant et al., 2006) and, in turn, adolescents' future goals or orientations toward education and work involvement. Empirical work on the links between parents' work and adolescents' future orientations has primarily focused on parent work status (i.e., lack of employment, Vandell & Ramanan, 1992; inflexibility, Galinsky, 2000; long hours, Harvey, 1999; instability, Barling & Mendelson, 1999), rather than on specific occupational characteristics or patterns of characteristics. This research has found negative links with academic and career aspirations. However, there is also some preliminary support for links between parents' experiences at work and adolescents' attitudes toward school (Sallinen,

Kinnunen, & Ronka, 2004). Based on theory and limited empirical work, it was hypothesized that mother-father occupational profiles with high levels of self-direction would be linked with higher educational and careers aspirations.

The role of sibling birth order and developmental status. The associations between parents' occupational characteristics and both parent-youth relationship qualities and youth's future orientations may differ for older versus younger adolescents who vary in both their *birth position* (i.e., older versus younger) and *developmental status* (i.e., middle/late adolescence versus late adolescence/early adulthood). For at least two reasons, it was hypothesized that these associations may be stronger for older early-adult siblings as compared to younger adolescent siblings. First, from a developmental perspective, siblings in early adulthood are expected to have stronger and more clearly formulated orientations toward the future (Steinberg, Graham, O'Brien, Woolard, Cauffman, & Banich, 2009) and, thus, may be more aware of and influenced by parents' work experiences as they develop their own future work and education plans. Second, research suggests that older siblings are likely to assume additional household responsibilities and caregiving roles as compared to younger siblings (Brody, 1998). To the extent that older siblings do assume additional burdens because of parents' work demands (e.g., physical demands, hazardous conditions), parents' occupational characteristics may have implications for the qualities of the parent-youth relationship in terms of lower warmth and greater conflict for older siblings. Of note, the roles of birth position and developmental status in the implications of work contexts on relationships and future orientations

is limited, due to the fact that these two variables are confounded in cross-sectional studies (i.e., older siblings are higher in rank in birth order than younger siblings); thus, this study explores these linkages longitudinally. Based on this theory and literature, stronger and more consistent associations of parents' occupational profiles with older siblings' (i.e., late adolescents/early adults) future orientations and relationship quality with parents were hypothesized as compared to younger siblings (i.e., middle/late adolescents).

Method

Participants

Data for this study came from an ongoing longitudinal study investigating the role of gender, culture, and family socialization processes in the lives of 246 Mexican American families with adolescent siblings (Updegraff et al., 2005). Given the goals of the larger study, criteria for participation were as follows: (a) mothers were of Mexican origin, (b) a 7^{th} grader was living in the home and not learning disabled, (c) an older sibling was living in the home (in all but two cases, the older sibling was the next oldest child in the family), (d) biological mothers and biological or long-term adoptive fathers lived at home (all non-biological fathers were in the home for a minimum of 10 years), and (e) fathers worked at least 20 hours/week. Most fathers (93%) also were of Mexican origin.

Families were recruited through junior high schools in five districts and five parochial schools that served ethnically and linguistically diverse communities in a southwestern metropolitan area. Schools were selected to represent a range of socioeconomic situations, with the proportion of students

receiving free/reduced lunch varying from 8% to 82% across schools. Letters and brochures describing the study (in both English and Spanish) were sent to 1,856 families, and bilingual staff made follow-up telephone calls to determine eligibility and interest in participation. Eligible families included 421 families (23% of the initial rosters and 32% of those who were contacted and screened for eligibility). Of those who were eligible, 284 (67%) agreed to participate, 95 (23%) refused, and 42 (10%) were unreachable, with 246 families completing interviews. The current sample is a subset of the full sample and included only dual-earner families (n = 160; both mothers and fathers employed) given the focus on patterns of mothers' and fathers' occupational characteristics.

At Time 1 (T1), dual-earner families represented a range of socioeconomic levels from poverty to upper class, with 11% meeting federal poverty guidelines. The annual median family income was $53,500, which was comparable to the median dual-earner Mexican-origin family income ($49,289) of the county from which the sample was drawn (U.S. Census Bureau, 2000). Families had an average of 3.58 children (SD = 1.24). Most parents completed interviews in Spanish (60%), were born outside the US (65%), had lived in the US an average of 13.39 (SD = 9.41) and 14.60 (SD = 8.69) years for mothers and fathers, respectively. Parents completed an average of 10 years of education (M = 10.96; SD = 3.64 for mothers and M = 10.47; SD = 4.19 for fathers). The majority of fathers (62%) and mothers (73%) worked the day shift. Fathers and mothers worked an average of 46.64 (SD = 11.62) and 35.90 (SD = 11.86) hours weekly, respectively, and had been in their current positions for 7.49 (SD = 7.04) and 4.03

(*SD* = 4.95) years, respectively. Mother occupations ranged in prestige from dishwasher to teacher, with the modal occupation of housekeeper, and for fathers, from car detailer to attorney, with the modal occupations of maintenance and construction workers. With respect to siblings, younger siblings were 51% female and 12.71 (*SD* = .58) years of age, and older siblings were 48% female and an average of 15.68 (*SD* = 1.62) years of age. Most siblings were born in the US (68% of younger siblings and 58% of older siblings) and interviewed in English (88% of younger siblings and 86% of older siblings).

The second set of interviews, here referred to as Time 2 (T2), were conducted five years after T1 when younger siblings were 17.70 years old (*SD* = .54) and older siblings were 20.69 (SD = 1.65); 78% of the families participated (*n* = 124). Those who did not participate either could not be located, had moved to Mexico, could not presently participate, were difficult to contact, or refused. Non-participating families at T2 (*n* = 36), compared to participating families, reported lower maternal income (*M* = $10,561; *SD* =$8,800 vs. *M* = $20,833; *SD* = $18,919), lower maternal education (*M* = 9.68; *SD* = 3.45 vs. *M* = 11.33; *SD* = 3.62), lower maternal job prestige (*M* = 32.46; *SD* = 9.60 vs. *M* = 38.05; *SD* = 2.36), and more children (*M* = 4.06; *SD* = 1.43 vs. *M* = 3.44; *SD* = 1.14) at T1. There were no other differences between participants and nonparticipants at T2 on mothers' and fathers' demographic variables. To account for differences, SES was controlled for in all longitudinal models.

Procedures

Data were collected at T1 and T2 during structured in-home interviews averaging three hours for parents and two hours for siblings. Bilingual interviewers conducted interviews separately with each family member using laptops and reading questions aloud due to literacy variations. Families received $100 and $125 honorariums at T1 and T2, respectively. The University's Institutional Review Board approved procedures, including the use of consents and assents (see Appendix A).

Measures

All measures were forward and back translated into Spanish and English by two separate individuals (Foster & Martinez, 1995), final translations were reviewed by a third native bilingual translator, and discrepancies were resolved by the research team. Measures of parents' occupational attributes and family and cultural characteristics were collected at T1 and parent-youth relationship quality and youth future orientations were assessed at T2. For all scales, higher scores indicate higher levels of the construct.

Occupational characteristics. Using data from the Occupational Information Network (O*Net; Peterson et al., 2001), objective measures of maternal and paternal occupational characteristics were constructed from parents' job descriptions at T1. The O*Net electronic database contains information that reflects the character of occupations and workers, and allows for the comparison of attributes and characteristics within and across occupations. The database contains hundreds of descriptors (e.g., knowledge, skills, activities, tasks) and

provides standardized scores on a 100-point scale that represent the degree of importance of a particular characteristic to an occupation. Descriptors from the database representing self-direction, hazardous conditions, and physical activity were used as per a previous validation study of the measures (Crouter, Lanza, Pirretti, Goodman, & Neebe, 2006b). Sixteen O*Net characteristics were combined to create a measure of *self-direction* that represents mean occupational complexity and management (e.g., making decisions, solving problems). The *hazardous conditions* measure, which represented mean stressors encountered at work due to physical hazards, was comprised of six characteristics (e.g., hazards, contaminants, or extremes of noise or temperature). The *physical activity* measure represented mean physical activity at work and was comprised of five characteristics (e.g., running, bending, or standing). Internal consistency was acceptable: α's = .96, .75, and .94 for mothers' and .94, .88, and .93 for fathers' self-direction, hazardous conditions, and physical activity, respectively.

Work background characteristics. To asses *work* background at T1, parents reported on the number of hours at work, job descriptions, and workplace discrimination. Parents reported on their jobs descriptions by responding to the following items: "What is your occupation? What are your main tasks and responsibilities?" Responses were coded for *occupational prestige* (i.e., ratings of "social standing" of Census occupational categories) using the National Opinion Research Council (NORC) coding system (Nakao & Treas, 1994) with a range of 0 (lowest) to 100 (highest). The measure of *workplace discrimination* assessed the extent that parents experienced discrimination and bias in the workplace using a

combination of Hughes and Dodge's (1997) measures of Institutional Discrimination and Interpersonal Prejudice in the Workplace. These measures were used to form a single scale from a mean of the 12-items that has been validated in in another study with this sample (Crouter et al, 2006a). Items (e.g., ''Mexicans/Mexican Americans get the least desirable assignments'') were rated from 1 "*strongly disagree*" to 4 "*strongly agree*," with Cronbach's α's = .89 and .88 for mothers and fathers, respectively.

Sociocultural correlates. To assess *sociocultural* correlates at T1, parents reported on their education in years, income, birth country (0 = Mexico, 1 = US), number of years in the US, and acculturation level. The measure of *family income* was a composite sum score of each parents' report of their own income from employment and any other income they might receive. A log transformation was applied to family income to correct for skew and kurtosis. Parents' levels of *acculturation* to US Anglo culture were measured with the 30-item ARSMA II (Cuéllar, Arnold, & Maldonado, 1995) scale, which assesses cultural orientations toward Mexican and Anglo culture independently. Parents responded to items about their family and cultural backgrounds using a 5-point scale (1 = *not at all*, 5 = *extremely often or almost always*). Sample items included "I enjoy Spanish language TV." and "I think in English." The acculturation scale is a linear score that represents a parent's score along a continuum from very Mexican oriented to very Anglo oriented by subtracting the Mexican orientation mean from the Anglo mean. This scale was developed specifically for Mexican Americans, has been used extensively, and has been deemed reliable and valid (Cuéllar et al., 1995).

For the current study, α = .89 and .92 for mothers' and .91 and .91 for fathers' Mexican and Anglo orientations, respectively.

Parent-youth relationship quality. As indicators of parent-youth relationship quality, siblings reported on warmth/acceptance from and frequency of conflict with both mothers and fathers at separate points in the interview at T2. Youth reported on the *warmth/acceptance* subscale of the Children's Report of Parental Behavior Inventory (Schwarz, Barton-Henry, & Pruzinsky, 1985). Each item (e.g., "I am able to make 'child's name' feel better when he/she is upset") was rated on a 5-point scale ranging from "*almost never*" to "*almost always*", and the mean of items was used for the scale score. Cronbach's α's = .89 and .94 for younger siblings and .92 and .93 for older siblings' reports on mothers and fathers at T2, respectively. Using an adapted version of measures by Smetana (1988) and Harris (1992), youth rated the frequency of *conflict* (1 = *not at all* to 6 = *several times a day*) with mothers and fathers over the past year on 12 topics (e.g., How often in the past year have you had disagreements or differences of opinion with your mom/dad about talking back or being disrespectful?"). Cronbach's α's = .86 and .84 for younger siblings' mean reports and .86 and .84 for older siblings' mean reports on mothers and fathers at T2, respectively.

Youth future orientations. Youth reported on their *educational aspirations* at T2 by responding to the following item: "How far would you like to go in school?" The response choice was on a continuous scale representing the total number of years of education (e.g., 12 = *high school diploma*, 21 = *MD, JD, DO, DDS, OR Ph.D.*). Youth also reported on their desired future jobs (*career*

aspirations) by responding to the following items: "What kind of job would you like to have when you are an adult?" at T1 and "Thinking about five years from now, what kind of job would you like to have?" at T2. Responses were coded for occupational prestige (i.e., ratings of "social standing" of Census occupational categories) using NORC coding system (Nakao & Treas, 1994) with a range of 0 (lowest) to 100 (highest).

Results

The results of the latent profile analysis (LPA) were organized around the three research goals (see Figures 6-9) for conceptual models including constructs from the three goals). The first goal was to identify profiles of mothers' and fathers' occupational characteristics using objective ratings of self-direction, hazardous conditions, and physical activity. The second goal was to examine correlates of mother-father profiles in terms of parents' sociocultural context (i.e., family income, parents' educational attainment, nativity, years in US, acculturation). The third goal was to investigate how profiles of parents' occupational characteristics were temporally linked to parent-youth relationship quality (i.e., warmth and conflict with mothers and fathers) and youth future orientations (i.e., educational and career aspirations) 5-years later, and to test for nonequivalence across youth birth order (i.e., younger vs. older siblings) on these associations. See Table 6 for means and standard deviations of all study variables.

LPA is similar to cluster analysis in that it is a method of finding subtypes of related cases from multivariate data but based on probabilistic theory. An advantage of LPA as a person-centered approach is that whereas traditional

methods of variable-oriented analytic strategies assume that the population under study is homogeneous, LPA enables researchers to detect population heterogeneity. LPA estimates the probability of an individual's membership in a profile based on a series of item scores (here maternal and paternal occupational self-direction, hazardous conditions, and physical activity). These groups, referred to as latent profiles, are categories of a latent variable, each one of which contains individuals who are similar to each other and different from individuals in other groups. The profiles are latent as individuals' group membership cannot be directly observed but is estimated from item scores. Thus, the goal of the current study was to identify groups of parents who were highly similar on the continuously measured observed occupational characteristics, and thus, to describe different categorical types of occupational characteristics associated with parents' jobs. The latent profiles reflect different patterns of characteristics that are important to mothers' and fathers' occupations. Parents within a profile show the same pattern of means pointing to similar patterns of important occupational characteristics. Between profiles, means can be highly dissimilar, indicating different *patterns* of important occupational characteristics.

To analytically test the goals of the current study, a series of LPA (an extension of latent class analysis with continuous variables, also called latent variable mixture modeling; Collins & Lanza, 2010) were estimated utilizing Mplus 6.11 (Muthén & Muthén, 2008-2010). As recommended by Collins and Lanza (2010), the LPA models were fit in a series of modeling steps and validating procedures. These steps began with a simple model to explore the

number and structure of occupational profiles and ended with the inclusion of meaningful covariates and distal outcomes to evaluate the validity of the classes. First, to determine the best profile solution, unconditional models were estimated including only the latent profile observed indicators (i.e., mothers' and fathers' self-direction, physical activity, and hazardous conditions). Second, the final solution was refit to include the identified sociocultural correlates (i.e., family income, parents' educational attainment, nativity, years in the US, and acculturation level). Third, to establish predictive validity, models were estimated that explored differences in family relationships and future orientations longitudinally. In all models, to avoid convergence on a local maximum, 500 random sets of starting values, 50 final stage optimizations, and 50 iterations in the initial stage were used (Collins & Lanza, 2010).

Identifying Profiles of Mother-Father Occupational Characteristics

To address *Goal 1*, the identification of family-level profiles of T1 mothers' and fathers' occupational characteristics, a series of five LPAs were estimated starting with the specification of a one-profile model and subsequently increasing the number of profiles until there was no further improvement in the model. These models included maternal and paternal occupational self-direction, hazardous conditions, and physical activity as observed indicators of the family-level occupational latent profiles. Profile indicators were not allowed to correlate per the local independence assumption of LPA (i.e., the latent profile variable accounts for all of the associations between the indicators).

Model fit determination was evaluated using a number of indices of which the most reliable are information criteria (IC) and likelihood ratio (LR) tests (Nylund, Asparouhov, & Muthén, 2007; Tofighi & Enders, 2007; Tein, Coxe, & Cham, in press). For IC indices, researchers have recommended the Bayesian information criteria (BIC) and the adjusted Bayesian information criteria (ABIC); a decrease in these indices when an additional profile was estimated indicated an improvement in model fit (Lubke & Muthén, 2005). With regard to LR tests, the Lo-Mendell-Rubin log likelihood test (LMR), the adjusted LMR, and the bootstrap likelihood-ratio test (BLRT) were used to determine whether a model with a given number (*k*) of profiles fit the data significantly better than a simpler model with one fewer profiles (*k* – 1; Tofighi & Enders, 2007). A significant LR test value indicated that the model in which *k* profiles were specified was a better fitting than the *k*-1 profile model. Lastly, model fit and interpretation of class solutions were substantively evaluated. The conditional response means (i.e., the class-specific means of the latent profile indicators) as compared to the overall sample means were examined to determine if each class offered a unique pattern and was substantively different from other classes. The distribution of the number of people in each class was also examined. Classes with small *n*s may not provide quality information; this would be grounds for choosing a previous model (Lawrence & Zyphur, 2011).

Table 7 presents ICs and LR results for each analysis. Additionally, the change in BIC and ABIC from a class solution to the next was charted in a scree plot to determine the best class solution visually by locating the class number at

which the change attenuates (see Figure 10; Lawrence & Zyphur, 2011). Results revealed that the 3-profile solution was the most optimal solution. In particular, as the LMR tests were close in significance levels for the 3- and 4-profile solutions and the change in BIC and ABIC decelerated after the 3-profile solution, it appeared that the 3-profile solution was the best fitting and most parsimonious model as compared to the 4-profile solution. Further, the 3-profile solution had better sample sizes per each profile as compared to the 4-profile solution and the 3-profile solution made sense substantively, as discussed subsequently. Interpretation of the classes is described in the section below where more complete models with covariates and distal outcomes were examined.

Mother-Father Occupational Profiles and Sociocultural Correlates

To address *Goal 2*, investigation of the sociocultural correlates of the LPA profiles (i.e., family income, parents' education, nativity, years in the US, and acculturation), these variables were included as covariates in the next set of analyses. The sociocultural correlates were added to the three-profile model. It should be noted that the latent profile solution could shift with the addition of new variables into the model. Significant changes can either indicate an unstable model or that, possibly, a simpler solution (e.g., 2-profile solution vs. 3-profile solution) would be more appropriate. Using logistic regression, the categorical latent profile variable was regressed on the continuous variables of family income, parents' education, years in the US, acculturation and the binary nativity variable (0 = Mexico, 1 = US). This allowed for the examination of differences on the sociocultural correlates being associated with profile membership, for

example, if those born in the US or Mexico were more likely to be in a certain occupational profile. All of the models from this point forward include the sociocultural correlates. First, the latent profiles and their structures were interpreted, and then the covariate results were presented.

Interpretation of profiles. The 3-solution model was refit to include the set of sociocultural correlates (i.e., family income, parents' educational attainment, nativity, years in the US, acculturation). This model closely replicated the 3-profile solution from the unconditional model (see Table 7) and had good fit, *BIC* = 7611.98, *ABIC* = 7472.69; LMR = 132.57, $p < .05$; adjusted LMR = 130.96, $p < .05$; BLRT = 132.57, $p < .05$; and latent class probabilities = .97, .95, .96.

Figure 11 provides a visual illustration of the latent profiles. Table 8 presents the 3-profile solution with means for each group, mean differences across the profiles, and within (i.e., family differences between mothers and fathers within profiles) and between (i.e., gender differences across families) profile gender differences as estimated by Wald Tests (1 degree of freedom). A majority of Mexican American families (49.1%; $n = 79$) had fathers and mothers who reported high levels of physical activity (PA) and hazardous conditions (HC), and low levels of self-direction (SD) (relative to other profiles), although fathers were significantly higher than mothers on self-direction and hazardous conditions, and mothers were higher than fathers on physical activity. Jobs that typified this profile included construction and operations positions for fathers and cleaning and food industry positions for mothers. Thus, this group was categorized as

Differentiated High PA. Next, 28.4% (n = 44) of families fell into a group that was characterized by differences in mothers' and fathers' work conditions, such that fathers' occupations were characterized by higher levels of hazardous conditions and physical activity, and lower levels of self-direction as compared to mothers. Typical positions of fathers in this profile included occupations in the janitorial and mechanical industries, and for mothers, positions in teaching and sales. Furthermore in comparison to the other profiles, this profile was the lowest on self-direction for fathers but highest for mothers; it was the highest on hazardous conditions for fathers but the lowest for mothers; and it was moderate on physical activity for fathers, but the lowest for mothers. Thus, this group was labeled *Incongruent*. Finally, the smallest group to emerge (22.5%; n = 37) was characterized by congruency between parents in that they worked in positions with the highest levels of self-direction and lowest levels of hazardous conditions and physical activity (as compared to the other profiles) and parents were not significantly different on any of these indicators. Thus, this group was categorized as *Congruent High SD*. Fathers in this profile were typically in management and executive positions and mothers were in office administration and accountancy positions.

Given the profiles did not include indicators of work demographics, post-hoc analyses were conducted examining if in fact parents in the profiles differed on work hours, occupational prestige, and workplace discrimination. Mplus 6.11 was used to test equality in means across classes using posterior probability-based multiple imputations (pseudo-class draws) with 1 degree of freedom for the

pairwise tests. Starting with *work hours*, results presented in Table 9 demonstrated no differences among the profiles on work hours. Turning to *occupational prestige*, results revealed that families in the Differentiated High PA and Incongruent profiles had lower paternal occupational prestige than families in the Congruent High SD profile. Results for mothers' occupational prestige revealed that families in the Differentiated High PA profile had lower maternal occupational prestige than families in the Congruent High SD and Incongruent profiles. Lastly, results for *workplace discrimination* revealed families in the Differentiated High PA profile had higher paternal workplace discrimination than families in the Congruent High SD profile. For mothers, families in the Differentiated High PA profile had higher maternal workplace discrimination that both the Incongruent and Congruent High SD profiles.

Examining sociocultural correlates. Next, the links between the sociocultural correlates and parents' occupational profiles were presented. Three covariate comparisons were made: (a) the likelihood of being in the Differentiated High PA profile compared to the Congruent High SD profile, (b) the likelihood of being in the Incongruent profile compared to the Congruent High SD profile, and (b) the likelihood of being in the Differentiated High PA profile compared to the Incongruent profile. The odds ratios of the associations between the sociocultural correlates and the occupational profiles were reported.

Table 10 presents the results of the sociocultural correlates analyses. Beginning with *family income*, results indicated that there was a significant negative family income effect on profile membership indicating that the odds of

membership increased with family income for the Congruent High SD profile as compared to the Differentiated High PA and Incongruent profiles. Turning to *educational attainment*, there was a significant negative association of *paternal* educational attainment on membership such that as paternal education increased there were greater odds of membership in the Congruent High SD as compared to the Differentiated High PA profile. There was also a significant negative association of fathers' educational attainment on membership in the Incongruent as compared to the Congruent High SD profile, indicating that families with lower paternal educational attainment were more likely to be in the Incongruent profile. For *mothers*, there was a significant negative association of maternal educational attainment on membership in the Differentiated High PA profile as compared to the Congruent High SD profile, indicating that families with lower maternal educational attainment were more likely to be in the Differentiated High PA profile. There was also a significant positive association for maternal education on membership in the Differentiated High PA profile as compared to the Incongruent profile, indicating that families with lower maternal educational attainment were more likely to be in the Differentiated High PA profile. For fathers' and mothers' *nativity*, there were no significant differences. Lastly, for *acculturation*, there was a negative association between fathers' acculturation and membership in the Incongruent profile as compared to the Congruent High SD profile, indicating that families with lower levels of paternal acculturation were more likely to be in the Incongruent profile. There were no associations for maternal acculturation.

Examining Outcomes: Parent-Youth Relationships and Youth Future Orientations

To address *Goal 3*, the temporally ordered associations between the T1 profiles and T2 parent-youth relationship quality and youth future orientations were examined. Significant findings provide evidence of the predictive validity of the profiles. The variation of youth's reports of maternal and paternal relationship quality (i.e., conflict, warmth) and future orientations (i.e., academic and career aspirations) at T2 across the three occupational profiles (T1) were examined. Using Mplus 6.11 (Muthén & Muthén, 2008-2010), the first set of analyses treated the relationship quality and future orientations variables as outcome variables in the LPA models. One LPA model was estimated for each of the outcome variables simultaneously for youth's reports of father- and mother-youth relationship quality for warmth and then for conflict, respectively. The outcome variables' variances were constrained to be equal across the occupational profiles due to the small sample size and potential estimation problems. Due to the nested nature of the data, errors were correlated within and between siblings on reports of parents (e.g., younger sibling report of mothers' warmth correlated with fathers' warmth and younger and older siblings' reports of mothers' warmth). To test which occupational groups differed in their mean outcome scores, a Wald Test was conducted on all between-group comparisons. Next, to test for the moderating role of sibling birth order on the associations of profiles with parent-youth relationships and youth's future orientations, comparisons were conducted by constraining siblings' means to be equal across class with significant

differences assessed with a Wald Test. Table 11 presents ICs and LMR results for each analysis. The 3-profile solution remained a stable model (i.e., both means and proportion of sample in each profile remained nearly identical to Figure 11) across all outcome models. Below, results were described that pertain to main effects and interactions involving profile membership. Other main effects (e.g., sibling differences) were noted in the table but not described in the text.

Table 12 presents the results for *relationship quality*, including sibling effects. Starting with *warmth*, results indicated a significant effect of profile on warmth with fathers. In particular, youth in the Differentiated High PA profile reported significantly higher youth-father warmth than did youth in the Incongruent profile. Additionally, youth in the Differentiated High PA profile had significantly higher youth-father warmth than the Congruent High Self-direction profile. Tests of nonequivalence revealed no significant birth order effects, $\chi^2(2) = 1.72$, ns. Turning to *conflict* with parents, results indicated a significant effect of profile on conflict with parents. Particularly, the Congruent High SD profile had significantly higher youth-father conflict than the Differentiated High PA and Incongruent profiles. Tests of nonequivalence revealed no significant differences by birth order for Differentiated High PA, $\chi^2(2) = 3.00$, ns, and Incongruent, $\chi^2(2) = 2.51$, ns. Additionally, there was a main effect of profile on youth-mother conflict. This association was different across sibling birth order, $\chi^2(2) = 7.39$, $p < .05$, indicating that maternal conflict was highest in the Congruent High SD and Differentiated High PA as compared to the Incongruent profiles for younger

siblings, but for older siblings, maternal conflict was highest in the Congruent High SD as compared to the other two profiles.

Table 13 presents the results for future orientations. Starting with *educational aspirations*, results indicated significant main effects of profile on educational aspirations. Specifically, youth in the Incongruent and Congruent High SD profiles had significantly higher educational aspirations then youth in the Differentiated High PA profile. Tests of nonequivalence revealed that there were no significant differences across sibling birth order (Congruent High SD and Incongruent profiles, $\chi^2(2) = 4.86$, $p = .09$, and of Differentiated High PA and Incongruent profiles, $\chi^2(2) = 4.87$, $p = .09$). Turning to *career aspirations*, results revealed a profile effect indicating that Congruent High SD profile included youth with significantly higher career aspirations as compared to the Differentiated High PA profile. There were no differences across siblings, $\chi^2(2) = 3.10$, *ns*.

In summary, results confirmed the predictive quality of the latent occupational profiles. For relationship quality, parents' occupational profiles predicted youth's warmth with fathers and conflict with fathers and mothers. Warmth with fathers was highest for families in the Differentiated High PA profile and conflict with fathers was highest in the Congruent High SD profile. For maternal conflict, these associations were not equivalent across sibling birth order, indicating different patterns of linkages for sibling-mother conflict with maternal conflict highest in both the Differentiated High PA and Congruent High SD profiles for younger siblings and highest in only the Congruent High SD profile for older siblings. The occupational profiles were also linked to youth's

future orientations. In particular, educational aspirations were highest for families in both the Incongruent and Congruent High SD profiles. Career aspirations were highest for families in the Congruent High SD profile.

Discussion

Studying the nature and correlates of parents' occupational contexts among Mexican-origin families is important, as this population is composed disproportionately of working poor (U.S. Census Bureau, 2011) in unskilled labor positions (Mosisa, 2002) whom are at risk for diminished quality of family relationships and adjustment via work-family spillover (Repetti, 1987). As guided by ecological (Bronfenbrenner & Crouter, 1982) and person-oriented (Magnusson, 1988) frameworks, this study contributed to the literature on work-family connections among Mexican American families in several ways. First, this study investigated *patterns* of mothers' and fathers' occupational characteristics given that little is known about the combination of positive *and* negative work qualities that serve as a context of family processes and individual development among Mexican American dual-earner families (Updegraff et al., 2007). As such, this study moves beyond variable-oriented research examining single dimensions of maternal or paternal occupational attributes to highlight *profiles* of objective family-level characteristics along three dimensions: self-direction, hazardous conditions, and physical activity. Second, in an attempt to contextualize the family-level occupational profiles, this study examined dimensions of families' sociocultural context - socioeconomic resources, nativity, years living in the US, acculturation – as profile correlates recognizing the multidimensional nature of

these cultural contexts (Gonzales et al., 2009). Third, to my knowledge, this study is the first to consider the role of parents' occupational contexts in predicting youth's future orientations among Mexican American families. Though the construct of positive future orientations has been widely accepted as a critical component of successful development among impoverished youth, it remains largely ignored by developmental scholars (for an exception, see Oettingen & Mayer, 2002).

Patterns of Maternal and Paternal Occupational Characteristics

Guided by a person-centered framework within an ethnic-homogenous design, the current study examined variability among Mexican American mothers' and fathers' occupational characteristics based on the indicators of self-direction, hazardous conditions, and physical activity. Evidence of three quantitatively and qualitatively distinct family-level objective occupational profiles (i.e., *Differentiated High Physical Activity*, *Incongruent*, and *Congruent High Self-Direction*) highlight the value of identifying work-family connections that go beyond the individual level (Bronfenbrenner & Crouter, 1982; Cox & Paley, 2003). The *Differentiated High Physical Activity* profile emerged as the most common profile, including nearly half of the families in this sample. The prevalence of an occupational profile consistently high on hazardous conditions and physical activity across mothers and fathers coincides with earlier research on the work contexts for Mexican American families (e.g., Updegraff et al., 2007). Although parents were differentiated on self-direction with fathers being significantly higher than mothers, families within this profile had the lowest levels

of self-direction as compared to both the other profiles for mothers and as compared to the *Congruent High Self-Direction* profile for fathers. For both mothers and fathers in this profile, the level of physical activity was higher than in the other two profiles. Most interesting, though, was that mothers were significantly higher than fathers on physical activity *within* the profile. Physically demanding jobs have been thought to be typically dominated by men (Jacobs & Steinberg, 1990), and Mexican American parents are often portrayed as assuming traditional gender roles (Baca Zinn, & Wells, 2000). In contrast, this finding supports work that has purported that in immigrant families women also assume physically active jobs (Updegraff et al., 2007) possibly due to the restriction of available jobs for this population.

As expected, families in this profile had the highest levels of workplace discrimination and the lowest levels of occupational prestige as compared to the other profiles, as well as having lower income than the *Congruent High Self-Direction* profile. Furthermore, families in this profile were differentiated on maternal and paternal education, with paternal education being low for this profile. Remarkably, for maternal education, families in this profile were more likely to have higher levels of maternal education as compared to the *Incongruent* profile, whereas, they were more likely to have lower levels than the *Congruent High Self-Direction* profile. This was unexpected because occupations characterized by high levels of hazardous conditions and physical activity do not require high skills or education of employees (Nightingale & Fix, 2004). This may be indicative of trends that show that some immigrants who enter the US

with sufficient education, nevertheless, work in unskilled labor positions (Nightingale & Fix, 2004). These families in the *Differentiated High Physical Activity* profile, with the lowest family income, may need mothers to work.

The second largest profile, the *Incongruent* pattern, was characterized by the largest differences between parents on hazardous conditions and physical activity as compared to the other profiles, with fathers being higher than mothers. For self-direction, mothers were significantly higher than fathers, but the interparental difference in self-direction was not significantly different in the *Incongruent* as compared to the other two profiles. Of note, for mothers, occupational prestige was higher and workplace discrimination was lower than the *Differentiated High Physical Activity* profile, but for fathers, occupational prestige was lower and workplace discrimination was higher than the *Congruent High Self-Direction* profile. This profile revealed substantial variability in work roles *within* families with mothers being in highly self-directed positions, whereas, fathers were in highly physical and hazardous positions. Furthermore, families in the *Incongruent* profile were more likely to have lower income and paternal education and were less acculturated than parents in the *Congruent High Self-Direction* profile. This profile may reflect a finding from previous work that Mexican American immigrant men as compared to women have a more difficult time of transitioning out of lower-skill positions (Blau & Kahn, 2007).

In the *Congruent High Self-Direction* profile, there was evidence of high levels of congruence across parents as compared to the other profiles. High levels of self-direction and low levels of hazardous conditions and physical activity for

both mothers and fathers characterized this profile. As expected, this profile had high levels of occupational prestige and low levels of workplace discrimination as compared to the *Differentiated High Physical Activity* profile for both mothers and fathers, and as compared to the *Incongruent* profile for fathers. This profile includes predominantly professional workers, a group that is well represented in the work-family literature (MacDermid, Roy, & Zvonkovic, 2005).

Taken together, the three occupational profiles exemplify the utility of exploring within-group variability. The finding of three distinct profiles of occupational characteristics that vary across sociocultural correlates within Mexican American families illustrated the need for examining the significant variability of work contexts *within* this cultural group. Furthermore, many studies of work-family dynamics have relied on between-family comparisons of primarily mothers, but these findings point to the value of incorporating a within-family component to examine the experiences of *both* mothers and fathers. Lastly, the previous work on work-family connections has relied on variable-oriented approaches (Perry-Jenkins et al., 2000), but these findings point to the importance of examining multiple indicators of occupational characteristics simultaneously, as well as identifying potential subpopulation differences.

Occupational Profiles as Linked to Family Relationships and Youth Future Orientations

Profiles of mother-father occupational characteristics were associated with parent-youth relationship quality, but varied as a function of parent gender and sibling birth order. Both younger and older siblings reported the highest level of

warmth with fathers in the *Differentiated High Physical Activity* profile as compared to the other two profiles. This is in contrast to the limited previous work with European American samples that links hazardous conditions and low levels of self-direction to increased stress and lower quality parent-child relationships (e.g., Goodman et al., 2008; Sears & Galambos, 1992). It is important to note that within this profile, both parents have physically demanding jobs and are experiencing high levels of discrimination, yet only fathers' levels of warmth with their children are significantly higher as compared to the other profiles. One possible explanation is that fathers may be compensating for mothers who lack energy due to the physically demanding nature of their jobs. Another possible explanation, is that experiences of discrimination may be more salient for fathers and they may be compensating by being emotionally supportive of their children. Family may be a source of giving for these fathers. Thus, it is important for future research to further investigate further the associations among fathers' occupations, perceptions of discrimination, and their relationships with their children.

Furthermore, older siblings reported the highest levels of conflict with fathers and mothers in the *Congruent High Self-Direction* as compared to the other two profiles. For younger siblings, conflict was also highest in the *Congruent High Self-Direction* profile, but differed only from the *Incongruent* profile. The families in the Congruent High Self-Direction profile were the most acculturated group. Thus, these results may reflect cultural differences in valuing the negotiation of autonomy within these families, which can lead to increased

conflict (e.g., Phinney, Kim-Jo, Osorio, & Vilhjalmsdottir, 2005). Additionally, as this is the group of parents who were in highly self-directed positions, their experiences at work may be spilling over to the family domain, leading to the fostering of more independence and decision-making skills for their children (Kohn & Schooler, 1982), who then argue more with their parents. It would be important for future work to examine the interplay of culture and occupation on family dynamics.

Profiles of mother-father occupational characteristics were associated with youth's future orientations. Specifically, younger and older siblings had the highest levels of educational aspirations and older siblings had the highest levels of career aspirations in the *Congruent High Self-Direction* profile. These findings are consistent with the previous theoretical work that links parents' experiences at work with adolescents' aspirations for the future (Bryant et al., 2006), and highlight the importance of parents' occupational contexts for youth's developing orientations toward the future.

These results have potentially important implications for well-being of Mexican American youth. The Congruent High Self-Direction profile was associated with less warmth and more conflict between parents and youth (relative to the other two profiles), but also higher educational and occupational aspirations. Thus, when parents work in highly self-directed and prestigious positions and have more socioeconomic resources, there appear to be both benefits and disadvantages for youth. Consistent with research on acculturation and family dynamics, which proposes that youth's faster acculturation relative to

parents is associated with more problematic family relationships (e.g., more conflict, less cohesion, Birman, 2006), youth in the Congruent High Self-Direction profile described the lowest levels of father-youth warmth and the highest levels of parent-youth conflict. These youth also had the highest levels of educational and career aspirations, in accord with work-family literature with primarily European American families that suggests that parents who work in highly self-directed positions have positive spill-over effects on the youth functioning (Perry-Jenkins et al., 2000).

Further, families in the Differentiated High Physical Activity profile held typical working class occupations with both parents in highly physical and hazardous positions with low levels of prestige and income and high levels of discrimination. In contrast with previous work that has found deleterious effects of these types of work positions and environments on family functioning (e.g., Conger et al., 2000), these families have high levels of father-youth warmth and low levels of parent-youth conflict. Thus, this work context may be protective via positive family dynamics. On the other hand, youth in this profile had the lowest levels of educational and career aspirations, and thus, may be disadvantaged in their future educational and occupational attainment.

Lastly, the Incongruent profile seemed to typify traditional working class immigrant families as fathers had the lowest levels of acculturation and fathers and mothers held gender-typed positions (e.g., fathers as mechanics and mothers as teachers). Consistent with the literature on immigrant families (Gonzales et al., 2009), these families had the lowest levels of parent-youth conflict, and high

levels of youth educational and career aspirations, and thus, this work context may be lead to protective benefits in terms of family functioning and youth's future aspirations. For fathers this was in contrast with previous work that found deleterious effects of hazardous, physically active positions, although this work has been largely anecdotal (Hovey & Magaña, 2002) or with mothers (Sears & Galambos, 1992). This work highlights the importance of examining both mothers' and fathers' work contexts as an examination of just mothers' or fathers' work may have led to different conclusions about work-family spillover. Further, these findings highlight the importance of more nuanced investigations of understudied parental work contexts and youth's educational/economic and psychological well-being to understand work-family connections.

Strengths, Limitations, and Future Directions

This study's strengths included the ethnic-homogenous, multilevel, person-oriented, and multidimensional design. Chief among these strengths is the prospective exploration of work-family processes among Mexican American parents and children, a population whose strengths are vastly understudied (Umaña-Taylor, 2009). This sample of primarily nonprofessional couples contributes important diversity to a literature dominated by studies of professional, middle-class workers and their families (MacDermid et al., 2005). Second, by including multiple family members (i.e., mothers, fathers, young and older siblings), the results provide us with richer information on the linkages between work and family contexts, as well as highlighting between- and within-family processes. The *between-family* differences (e.g., occupational profiles

differentially associated with family income) further highlight the variability within the Mexican American population on work-family linkages, whereas, *within-family* differences (e.g., occupational profiles differentially associated with maternal conflict for young and older siblings) draw attention to possible non-shared factors that contribute to different experiences of members of the same family (e.g., Dunn & Plomin, 1990). Third, the use of a longitudinal person-oriented analytic strategy has the advantage of providing specific information about the potential differences in family processes for population subgroups. LPA is an excellent tool for extracting typologies that exemplify variability within a group and move beyond single-variable conceptualizations of work-family linkages. Fourth, this study included multiple dimensions of occupational characteristics, parent-youth relationships, and youth's future orientations to capture the complex nature of associations between parents' occupational contexts and family functioning. Much of the previous research on work-family connections has examined only negative *or* positive dimensions of work and family, but few have included both (Perry-Jenkins et al., 2000).

Despite the contributions, there are important limitations to consider. First, this study focused on a specific Mexican American population: dual-earner two-parent families with two adolescent offspring from the US Southwest. Replications of the findings should include Mexican American families from different geographic locations or with different family and work structures to foster the generalization of findings to other subgroups of this population. Second, the nature of the sample was such that over 75% of parents were born in Mexico

and were interviewed in Spanish; thus, it was not possible to disentangle effects of parents' acculturation and nativity. It will be important for future work to pay attention to generational status and language use, in addition to, acculturation and nativity, and the roles they play in the availability of work opportunities and, thus, how they shape family experiences.

Conclusion

This investigation provided compelling evidence for parents' occupational characteristics as being a significant component of the work context that have important implications for family relationships and youth's development. The current study examined patterns of important occupational characteristics of parents' work as associated with aspects of the sociocultural context and parent-youth relationship quality and future orientations for older and younger siblings. Such findings help illustrate how a significant extra-familial context related to distinct dimensions of family and individual functioning. The fact that families within the occupational profiles showed differences in paternal warmth, maternal and paternal conflict, and youth's future orientations illustrates how important parental occupational contexts are for youth educational and economic, as well as, psychological well-being. As such, these findings highlight the need for increasingly sophisticated research questions and innovative analytic approaches as applied to the examination of the complex connections between work-family processes within different social ecologies.

DISSERTATION CONCLUSION

My dissertation focused on salient ecological contexts as related to psychosocial functioning for Mexican American families. Drawing from three theoretical frameworks (i.e., ecological, person-centered, and family systems' theory), I investigated associations between marital negativity and spouses' depressive symptoms and identified salient parental occupational profiles important for Mexican American parent-youth relationships and youth's future orientations. These studies add to the current literature by providing examples of innovative methodological tools and ethnic-homogenous designs to increase our understanding Mexican American individual and family processes. Further, these studies contribute to our understanding of the links between social contexts with individual mental health, relationship quality, and youth adjustment and the roles of parent gender and sibling birth order in these associations.

My dissertation used innovative analytic techniques and methodology in trying to understand normative Mexican American individual and family functioning. There is a considerable lack of knowledge regarding the links between normative family dynamics, larger social structures, and individual functioning among Mexican-American families. Study 1 illustrated three dyadic data analytic strategies and identified linkages between husbands' and wives' marital negativity and somatic symptoms longitudinally. Study 2 used a person-centered analytic strategy (i.e., LPA) to identify unique patterns of parental occupational characteristics in Mexican American families and determine how

these patterns related to parent-youth relationship quality and late adolescents'/early adults' academic and career aspirations, prospectively.

Another important contribution was the ethnic-homogeneous design. Given the growth of the Latino population in the US and that, Mexican Americans make up the largest subgroup of this population (US Census Bureau, 2011); it is crucial to investigate the *variability* within this population. By focusing only on families of Mexican descent, I was able to accentuate the variability that exists within this growing US population. In Study 2, my findings revealed three different occupational contexts of Mexican American parents that varied in terms of family income, both parents' educational attainment, occupational prestige, and workplace discrimination, and fathers' acculturation levels. By including sociocultural correlates (e.g., acculturation) in studies of family processes, it was possible to see the variability that exists within the population of Mexican American families.

These two studies contribute to our understanding of individual and family functioning in complex ways as depicted by associations with parent gender and sibling birth order. With respect to marital processes and individual mental health, Study 1 results revealed similarity in process by parent gender in that marital negativity as a precursor to spouses' somatic symptoms did not vary by gender, and there was not mutual influence among husbands' and wives' marital negativity on their spouses' somatic symptoms. On the other hand, results for somatic symptoms as a precursor to marital negativity highlighted different associations by gender (e.g., husbands' somatic symptoms were related to wives'

marital negativity only). Furthermore, Study 2 highlights work-family connections varying by parental gender. For example, the role of work on mothers' relationships with youth was most important for the domain of conflict, whereas for fathers, it was important for both warmth and conflict. Lastly, Study 2 also highlights the importance of examining family processes across multiple members of the family and in particular by sibling birth order. For example, results revealed differences across occupational profiles in mothers' conflict with older siblings only. By including both parents and two siblings from the same family, it was possible to determine if different aspects of family and individual functioning mattered for mothers versus fathers and older versus younger siblings. The process of investigating *within-family* variability provides a window into the processes underlying family and individual functioning of the growing US population of Mexican American youth and their families.

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Table 1

Analytic Steps of Three Approaches to Modeling Dyadic Data

Steps	Actor-Partner Interdependence Model	Difference	Two-Intercept
1	Estimate a saturated model and determine if actor effects are nontrivial (i.e., standardized regression coefficients > .10).	Estimate a measurement model with the DVs and without IVs.	Estimate a measurement model with an intercept (i.e., average DV score for either the couple or the dyad member coded 0) and slope (i.e., difference on the DV).
1a	Test for equality of DV means by constraining means to be equal. Use a χ^2 difference test to determine the best fitting model (i.e., model 1 or 1a).		Estimate two models, constraining the slope and the intercept variance to 0. Use a χ^2 difference test to determine the best fitting model.
2	Test for distinguishability between partners (i.e., partner differences on any terms in model).	Estimate a structural model predicting DVs.	Estimate a structural model predicting the intercept and slope.
2a	Estimate a model constraining the actor and partner effects to be equal, respectively. Use a χ^2 difference test to determine if this or the Step 1 model fits better.		
2b	If Model 2a fits better than the final model from Step 1, estimate a model with the following six equality constraints: (a/b) equal means and variances of the IVs, (c) equal intercepts of the DVs, (d) equal error variances, (e) equal actor effects, and (f) equal partner effects. Use a χ^2 difference test to determine the best fitting model (i.e., Model 2a or 2b).		
3	Estimate a model freely estimating *k* parameters. Then estimate a model with *k* parameters constrained across dyad members. Use a χ^2 difference test to determine the best fitting model.		
3a	Use the final model from Step 3. Estimate three models with *k* parameter(s) constrained to first 0, then 1, then -1. Use the 95% CI of the *k* parameter to identify the pattern of influence.		

Note. DV = dependent variable; IV = independent variable; CI = confidence interval.

Table 2

Correlations and Descriptive Statistics for Study 1 Variables (N = 246 Dyads)

Variables	1	2	3	4	5	6	7	8	9	10
Time 1										
1. Poverty	-	-.01	-.18*	-.04	.11	.08	-.03	-.04	.09	-.10
2. Yrs married		-	-.09	-.09	-.10	-.09	-.11	-.13	-.07	-.08
3. H SS			-	.26*	.29*	.21*	.42*	.11	.09	.28*
4. W SS				-	.13*	.39*	.35*	.46*	.05	.33*
5. H MN					-	.33*	.25*	.12	.43*	.24*
6. W MN						-	.25*	.34*	.12	.51*
Time 2										
7. H SS							-	.22*	.27	.25*
8. W SS								-	.01	.27*
9. H MN									-	.35*
10. W MN										-
M	2.33	17.52	1.79	1.83	3.97	4.43	1.75	1.77	3.10	4.10
SD	2.04	5.34	.51	.56	1.63	1.69	.59	.58	1.85	1.79

Note. H = husbands, W = wives, SS = somatic symptoms, MN = marital negativity.
*$p < .05$.

Table 3

APIM Technique: Chi-Square Difference Tests of Nested Models for Predicting T2 Somatic Symptoms and Marital Negativity

Model	χ^2 (df)	CFI	RMSEA	SRMR	Model Comparison	$\Delta\chi^2$
Somatic Symptoms						
Model 1: fully saturated model	$\chi^2(0) = .00$					
Model 1a: means constrained	$\chi^2(1) = .03$	1.00	.00	.01	M_{1a} vs. M_1	$\Delta\chi^2(1) = .03$
Model 2: actor/partner effects constrained	$\chi^2(3) = 3.01$	1.00	.00	.03	M_2 vs. M_{1a}	$\Delta\chi^2(2) = 2.98$
Model 2a: indistinguishable	$\chi^2(6) = 17.14^*$	.69	.09	.05	M_{2a} vs. M_2	$\Delta\chi^2(3) = 14.13^*$
Model 2b: indistinguishable (MN means freed)	**$\chi^2(5) = 3.52$**	**1.00**	**.00**	**.04**	**M_{2b} vs. M_2**	**$\Delta\chi^2(2) = .51$**
Model 3: *k*s unconstrained	$\chi^2(4) = 3.67$	1.00	.00	.04		
Model 3a: *k*s constrained	$\chi^2(5) = 3.71$	1.00	.00	.04	M_{3a} vs. M_3	$\Delta\chi^2(1) = .04$
Model 3b: *k* = 0	**$\chi^2(6) = 5.72$**	**1.00**	**.00**	**.05**	**M_{3b} vs. M_{3a}**	**$\Delta\chi^2(1) = 2.01$**
Model 3c: *k* = 1	$\chi^2(6) = 8.01$	.93	.04	.05	M_{3c} vs. M_{3a}	$\Delta\chi^2(1) = 4.30^*$
Model 3d: *k* = -1	$\chi^2(6) = 25.83^*$	.29	.12	.12	M_{3d} vs. M_{3a}	$\Delta\chi^2(1) = 22.11^*$
Marital Negativity						
Model 1: fully saturated model	$\chi^2(0) = .00$					
Model 1a: means constrained	**$\chi^2(1) = 1.94$**	**.98**	**.06**	**.04**	**M_{1a} vs. M_1**	**$\Delta\chi^2(1) = 1.94$**
Model 2: actor/partner effects constrained	$\chi^2(3) = 28.00$	.33	.18	.09	M_2 vs. M_{1a}	$\Delta\chi^2(2) = 26.06^*$
Model 3: *k*s unconstrained	$\chi^2(1) = 3.92$	.92	.11	.05		
Model 3a: *k*s constrained	$\chi^2(2) = 4.15$	.94	.07	.05	M_{3a} vs. M_3	$\Delta\chi^2(1) = .24$
Model 3b: *k* = 0	$\chi^2(3) = 11.92^*$	.76	.11	.07	M_{3b} vs. M_{3a}	$\Delta\chi^2(1) = 7.77^{**}$
Model 3c: *k* = 1	**$\chi^2(3) = 4.59$**	**.20**	**.05**	**.06**	**M_{3c} vs. M_{3a}**	**$\Delta\chi^2(1) = .44$**
Model 3d: *k* = -1	$\chi^2(3) = 46.21^*$	.00	.24	.16	M_{3d} vs. M_{3a}	$\Delta\chi^2(1) = 42.06^*$

Note. $N = 246$ dyads. Bolded text indicates the adopted models.

$^*p < .05$.

Table 4

Parameter Estimates for Models Predicting Spouses' T2 Somatic Symptoms (N = 246 Dyads)

	APIM		Two-Intercept		Difference	
Parameter	*Unstandardized (SE)*	*S*	*Unstandardized (SE)*	*S*	*Unstandardized (SE)*	*S*
Path Coefficients						
T1 H MN → T2 H SS (actor)	.10* (.02)	.27	.06* (.03)	.20		
T1 W MN → T2 W SS (actor)	.10* (.02)	.27	.12* (.03)	.39		
T1 H MN → T2 W SS (partner)	.03† (.02)	.10	.01 (.03)	.03		
T1 W MN → T2 H SS (partner)	.03† (.02)	.10	.06* (.03)	.20		
T1 poverty ratio → T2 H SS			-.02 (.02)	-.08		
T1 poverty ratio → T2 W SS			-.02 (.02)	-.07		
T1 H MN → intercept[1]					.04† (.02)	.21
T1 W MN → intercept[1]					.09* (.02)	.56
T1 H MN → slope[2]					-.06 (.04)	-.89
T1 W MN → slope[2]					.05 (.04)	.84
Means and intercepts						
T2 H SS	1.22* (.11)	2.06	1.20* (.14)	2.54		
T2 W SS	1.22* (.11)	2.06	1.22* (.15)	2.37		
T1 H MN	3.97* (.11)	2.39	3.97* (.10)	2.44	3.97* (.10)	2.44
T1 W MN	4.43* (.11)	2.67	4.43* (.11)	2.61	4.43* (.11)	2.62
Intercept[1]					1.20* (.10)	4.31
Slope[2]					.03 (.18)	-.31
Variances and covariances						
Residual for T2 H SS	.31*** (.03)	.90	.20* (.03)	.89	.26* (.03)	.77
Residual for T2 W SS	.31*** (.03)	.90	.22* (.03)	.84	.26* (.03)	.75
Residual for intercept[1]					.04† (.03)	.56
Covariance of residuals	.05* (.03)	.16	.05† (.02)	.22		
Covariance T1 H and W MN	.91* (.19)	.33	.91* (.19)	.33	.91* (.19)	.33
R^2 T2 H SS	.10* (.03)		.11* (.05)		.22* (.09)	
R^2 T2 W SS	.10* (.03)		.16* (06)		.25* (.08)	
R^2 intercept[1]					.44* (.17)	
k	.31, 95% CI[-.06, 1.09]					

Note. S = standardized H = husbands, W = wives. MN = marital negativity, SS = somatic symptoms. [1]SS grand mean. [2]SS difference. †$p < .10$. *$p < .05$.

Table 5

Parameter Estimates for Models Predicting T2 Marital Negativity (N = 246 Dyads)

	APIM		Two-Intercept		Difference	
Parameter	*Unstandardized (SE)*	*S*	*Unstandardized (SE)*	*S*	*Unstandardized (SE)*	*S*
Path coefficients						
T1 H SS → T2 H MN (actor)	.58* (.23)	.18	.45† (.23)	.17		
T1 W SS → T2 W MN (actor)	.83* (.23)	.27	.86* (.22)	.34		
T1 H SS → T2 W MN (partner)	.61* (.23)	.18	.62* (.23)	.22		
T1 W SS → T2 H MN (partner)	.40† (.28)	.14	.24 (.24)	.11		
T1 Poverty ratio → T2 H MN			.08 (.06)	.13		
T1 Poverty ratio → T2 W MN			-.05 (.05)	-.07		
T1 H SS → intercept[1]					.57* (.21)	.31
T1 W SS → intercept[1]					.52* (.20)	.31
T1 H SS → slope[2]					.40 (.32)	.39
T1 W SS → slope[2]					.77* (.32)	.82
Means and intercepts						
T2 H MN	1.66* (.43)	1.03	1.74* (.56)	1.35		
T2 W MN	1.66* (.43)	.96	1.19* (.54)	.85		
T1 H SS	1.79* (.03)	3.53	1.79* (.03)	3.53	1.79* (.03)	3.53
T1 W SS	1.83* (.04)	3.29	1.83* (.04)	3.29	1.83* (.04)	3.29
Intercept[1]					1.89* (.45)	2.05
Slope[2]					-1.30† (.71)	-2.49
Variances and covariances						
Residual for T2 H MN	2.43* (.29)	.93	1.54* (.28)	.94	1.85* (.22)	.73
Residual for T2 W MN	2.55* (.29)	.87	1.55* (.26)	.79	1.85* (.22)	.56
Residual for intercept[1]					.65* (.22)	.76
Covariance of residuals	.55* (.21)	.22	.37* (.18)	.24		
Covariance T1 H and W SS	.07* (.02)	.26	.07* (.02)	.26	.08* (.02)	.27
R^2 T2 H MN	.07* (.03)		.06 (.04)		.27* (.08)	
R^2 T2 W MN	.13* (.04)		.22* (.07)		.38* (.07)	
R^2 intercept[1]					.24* (.11)	
k	.55, 95% CI[.19, 1.99]					

Note. S = standardized. H = husbands, W = wives. MN = marital negativity, SS = somatic symptoms. [1]MN grand mean. [2]MN Difference.
†$p < .10$. *$p < .05$.

Table 6

Descriptive Statistics for Study 2 Variables (N = 160 Families)

		Fathers		Mothers	
Variable	Time	*M*	*SD*	*M*	*SD*
Indicators of latent profile					
Self-direction	T1	49.36	10.13	46.80	11.65
Hazardous conditions	T1	44.93	18.05	25.93	12.50
Physical activity	T1	58.77	18.97	55.20	22.24
Work demographics					
Work hours	T1	46.64	11.62	35.90	11.86
Occupational prestige	T1	38.32	10.39	36.77	11.99
Workplace discrimination	T1	2.44	.59	2.36	.64
Sociocultural correlates					
Family income	T1	4.70	.26	4.70	.26
Educational attainment	T1	10.47	4.18	10.96	3.63
Nativity	T1	.35	.47	.34	.47
Years in US	T1	24.46	15.61	22.64	15.14
Acculturation[1]	T1	-.73	1.53	-.92	1.49
Outcomes					
Warmth with parent					
Younger siblings	T2	3.47	1.06	3.84	.91
Older siblings	T2	3.43	1.03	4.08	.80
Conflict with parent					
Younger siblings	T2	2.09	.70	2.33	.77
Older siblings	T2	2.00	.77	2.06	.82
		Younger Siblings		Older Siblings	
Educational aspirations	T2	16.11	2.52	16.02	2.24
Career aspirations	T2	53.44	14.29	52.89	12.46

Note. T1 = time 1, T2 = time 2. Nativity: 0 = Mexico, 1 = US. [1]A difference score created by subtracting Mexican from Anglo Orientations.

Table 7

Model Fit Indices for Latent Profile Analyses (N = 160 Families)

Profiles	BIC	ABIC	LMR	Adjusted LMR	BLRT	Class assignment probabilities
1	7931.15	7893.16	-	-	-	-
2	7724.35	7664.20	242.31*	235.69*	242.33*	.97, .98
3	**7655.78**	**7573.47**	**104.10***	**101.25***	**104.10***	**.91, .96, .96**
4	7619.82	7515.35	71.49*	69.53*	71.49*	.94, .99, .95, .93
5	7618.63	7492.00	36.72	35.71	36.72*	.89, .95, .96, .98, .99

Note. AIC = Akaike information criterion; BIC = Bayesian information criterion; ABIC = sample-size adjusted Bayesian information criterion; LMR = Lo-Mendell-Rubin, BLRT = bootstrap likelihood-ratio test. Bolded text indicates the optimal solution.
*$p < .05$.

Table 8

LPA Conditional Response Means across Profile Solutions

Occupational characteristic	Profiles		
	Differentiated High PA (n = 79) *M*	Incongruent (n = 44) *M*	Congruent High SD (n = 37) *M*
Self-direction			
Father	47.66_{a}	45.04_{a}	58.60_{b}
Mother	39.79_{a}	53.14_{b}	54.00_{b}
F-M difference	7.87^{***}	-8.09^{**}	4.60†
Hazardous conditions			
Father	52.05_{a}	51.31_{a}	21.38_{b}
Mother	33.97_{a}	18.90_{b}	17.51_{b}
F-M difference	18.08_{a}^{***}	32.41_{b}^{***}	3.87_{c}
Physical activity			
Father	67.38_{a}	64.62_{b}	32.66_{c}
Mother	73.94_{a}	39.89_{b}	33.78_{b}
F-M difference	-6.56_{a}^{***}	24.73_{b}^{***}	-1.12_{a}

Note. PA = physical activity, SD = self-direction; F-M = father compared to mother within profile. Means in the same row that do not share subscripts are significantly different from one another at $p < .05$.

$^{*}p < .05$.

Table 9

Work Demographics Means across Profile Solutions

	Profiles		
Work demographic	Differentiated High PA (n = 79) *M*	Incongruent (n = 44) *M*	Congruent High SD (n = 37) *M*
Work hours			
Father	45.61_{a}	46.34_{a}	49.23_{a}
Mother	34.20_{a}	37.73_{a}	37.29_{a}
Occupational prestige			
Father	34.56_{a}	36.44_{a}	48.67_{b}
Mother	28.41_{a}	43.51_{b}	46.64_{b}
Workplace discrimination			
Father	2.55_{a}	2.44_{ab}	2.18_{b}
Mother	2.52_{a}	2.16_{b}	2.25_{b}

Note. PA = physical activity, SD = self-direction. Means in the same row that do not share subscripts are significantly different from one another at $p < .05$.

Table 10

Three-Class Model with the Sociocultural Correlates as Covariates

	DPA vs. CSD		IN vs. CSD		DPA vs. IN	
Sociocultural correlates	Logit	Odds ratio	Logit	Odds ratio	Logit	Odds ratio
Family income	-5.06**	.01	-3.74*	.02	1.33	3.76
Educational attainment						
Fathers	-.31*	.73	-.36*	.70	-.05	.95
Mothers	-.46*	.63	-.15	.86	.31**	.74
Years in US						
Fathers	.06	1.06	.04	1.04	-.02	.98
Mothers	-.13	.88	.02	1.02	.15	1.16
Nativity						
Fathers	.04	1.04	-.21	.81	-.25	.78
Mothers	2.70	14.85	-.53	.59	-3.22	.04
Acculturation						
Fathers	-1.23†	.29	-1.14**	.32	.08	1.09
Mothers	-.30	.74	.50	1.65	.80	2.23

Note. DPA = differentiated high physical activity, CSD = congruent high self-direction, IN = incongruent
†$p < .10$. *$p < .05$. **$p < .01$.

Table 11

Model Fit Indices for Latent Profile Analyses in Predicting Outcomes

Models	BIC	ABIC	LMR	Adjusted LMR	BLRT	Class Assignment Probabilities
Covariates	7611.98	7472.69	132.57*	130.96*	132.57*	.97, .95, .96
Warmth	8708.00	8480.07	161.03*	159.72*	161.03*	.98, .95, .97
Conflict	8398.27	8170.34	160.89*	159.58*	160.89*	.98, .97, .95
Educational aspirations	8644.54	8470.43	135.45†	134.06†	135.45*	.97, .95, .98
Career aspirations	9247.12	9073.01	135.41*	134.02*	135.41*	.97, .94, .97

Note. N = 160. T1 = time 1, T2 = time 2; AIC = Akaike information criterion, BIC = Bayesian information criterion, ABIC = sample-size adjusted Bayesian information criterion, LMR = Lo-Mendell-Rubin, BLRT = bootstrap likelihood-ratio test.
†$p < .10$. *$p < .05$.

Table 12

Latent Profile on Relationship Quality at Time 2 (N = 160 Families)

Dependent variables	DPA *M*	IN *M*	CSD *M*
Warmth model			
Warmth with fathers			
Younger siblings	3.87_{a}	3.15_{b}	3.61_{ab}
Older siblings	4.14_{a}	3.50_{b}	3.47_{b}
Difference	$-.27_{a}$	$-.36_{a}^{**}$	$.14_{a}$
Warmth with mothers			
Younger siblings	4.01_{a}	3.91_{a}	3.92_{a}
Older siblings	4.06_{a}	4.36_{a}	4.05_{a}
Difference	$-.05_{a}$	$-.45_{a}^{***}$	$-.13_{a}$
Conflict model			
Conflict with fathers			
Younger siblings	2.04_{a}	2.01_{a}	2.20_{a}
Older siblings	1.75_{a}	1.84_{a}	2.34_{b}
Difference	$.29_{a}$	$.16_{a}$	$-.14_{a}$
Conflict with mothers			
Younger siblings	2.23_{ab}	2.08_{a}	2.57_{b}
Older siblings	1.79_{a}	1.93_{a}	2.46_{b}
Difference	$.44_{a}^{**}$	$.15_{b}$	$.11_{b}$

Note. Conflict estimated in one model and warmth in another. DPA = differentiated high physical activity, IN = incongruent, CSD = congruent high self-direction. Means in the same row that do not share subscripts are significantly different from one another at $p < .05$. Asterisks represent a significant sibling difference for the dependent variable of interest within a column.
$^{\dagger}p < .10$. $^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

Table 13

Latent Profile on Future Orientations at Time 2 (N = 160 Families)

	DPA	IN	CSD
Dependent variables	*M*	*M*	*M*
Educational aspirations' model			
Younger siblings	15.73_{a}	15.82_{a}	17.45_{b}
Older siblings	15.32_{a}	17.02_{b}	17.14_{b}
Difference	$.41_{a}$	-1.20_{a}^{*}	$.30_{a}$
Career aspirations' model			
Younger siblings	51.24_{a}	54.30_{a}	52.68_{a}
Older siblings	52.45_{a}	53.44_{ab}	58.28_{b}
Difference	-1.22_{a}	$.87_{a}$	$-5.60_{a}^{\dagger}$

Note. Estimated in two separate models. DPA = differentiated high physical activity, IN = incongruent, CSD = congruent high self-direction. Means in the same row that do not share subscripts are significantly different from one another at $p < .05$. Asterisks represent a significant sibling difference for the dependent variable of interest within a column.
$^{\dagger}p < .10$. $^{*}p < .05$. $^{**}p < .01$.

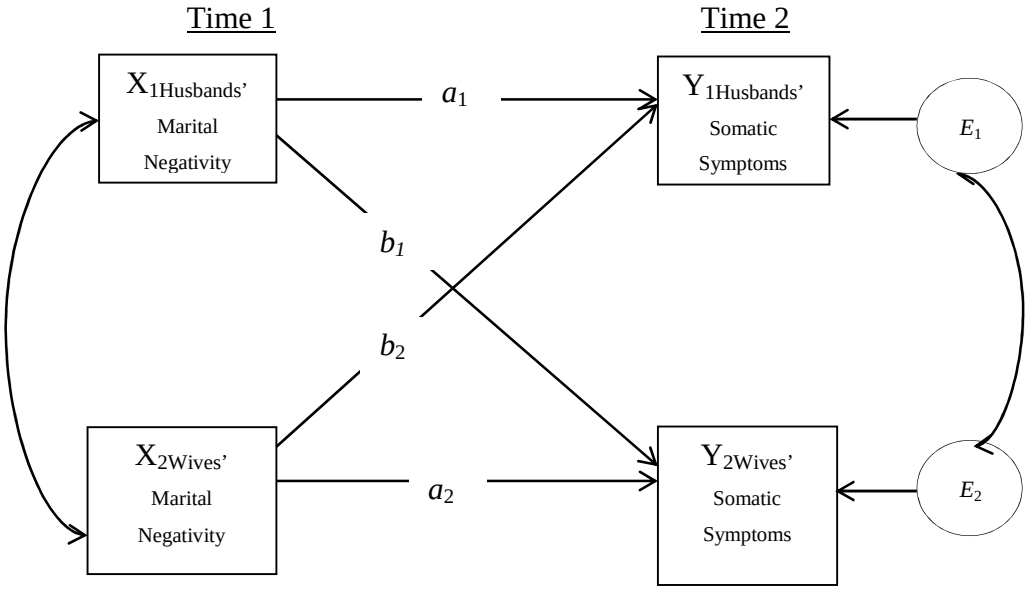

Figure 1a. Step 1 of the actor-partner interdependence model. Saturated model where all paths are freely estimated. Paths denoted as a_1 and a_2 represent actor effects, and b_1 and b_2 represent partner effects. Step 1a: constrain means of Y_1, and Y_2 to be equal. X_1, X_2, Y_1, and Y_2 are measured variables. E_1 and E_2 denote errors.

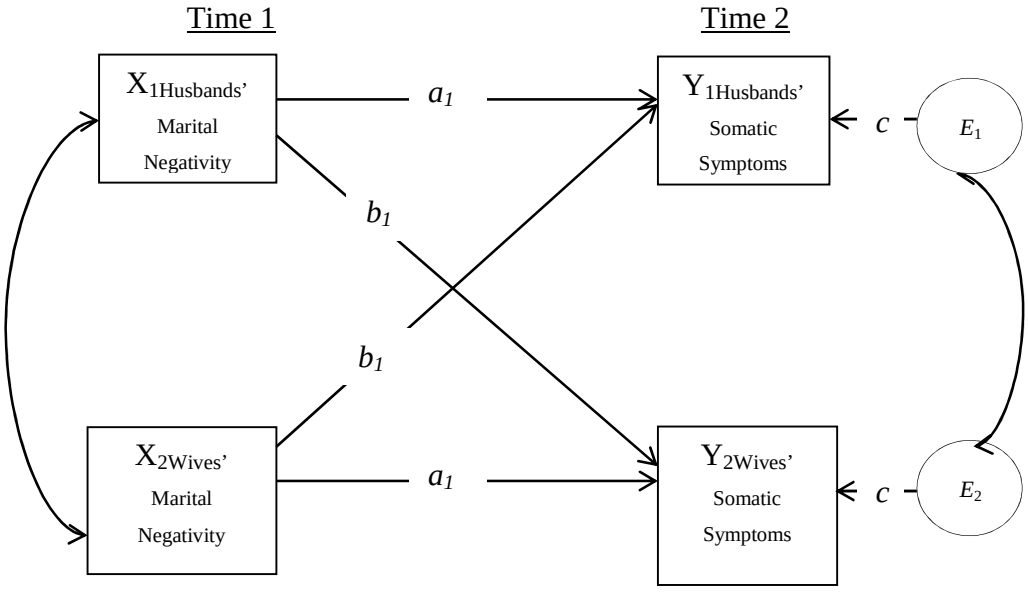

Figure 1b. Step 2: Indistinguishable model of the actor-partner interdependence model. Step 2a: constrain partner and actor paths to be equal. Step 2b: add six equality constraints. Paths with the same labels indicate equality constraints. For simplicity, the IV mean and variance constraints are not pictured. X_1, X_2, Y_1, and Y_2 are measured variables. E_1 and E_2 denote errors.

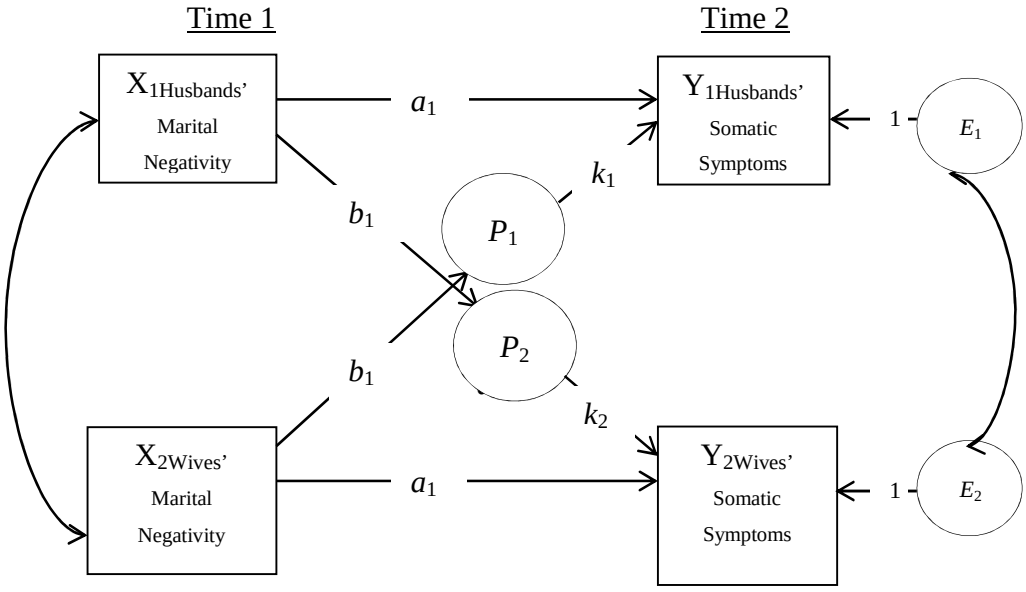

Figure 1c. Step 3: The full actor-partner interdependence model. X_1, X_2, Y_1, and Y_2 are measured variables. Phantom variables, P_1 and P_2, were used to estimate k_1 and k_2. E_1 and E_2 denote errors. Paths denoted as a_1 represent actor effects and paths denoted as b_1 represent partner effects.

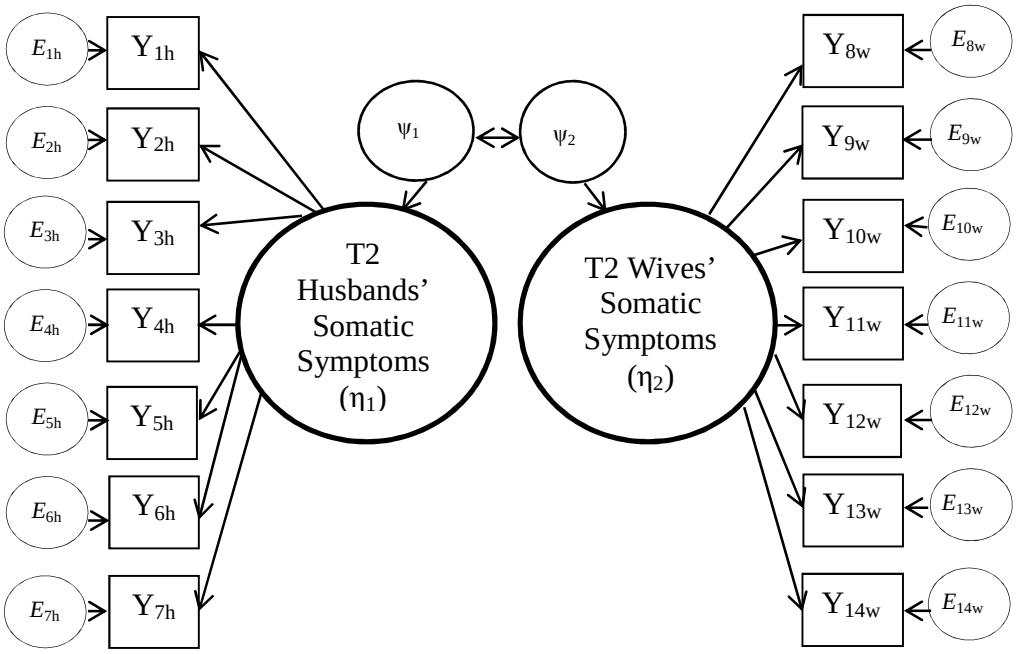

Figure 2a. Step 1: The two-intercept measurement model. T2 = time 2. h = husbands, w = wives. To simplify the figure, the mean structure and fixed values are not presented.

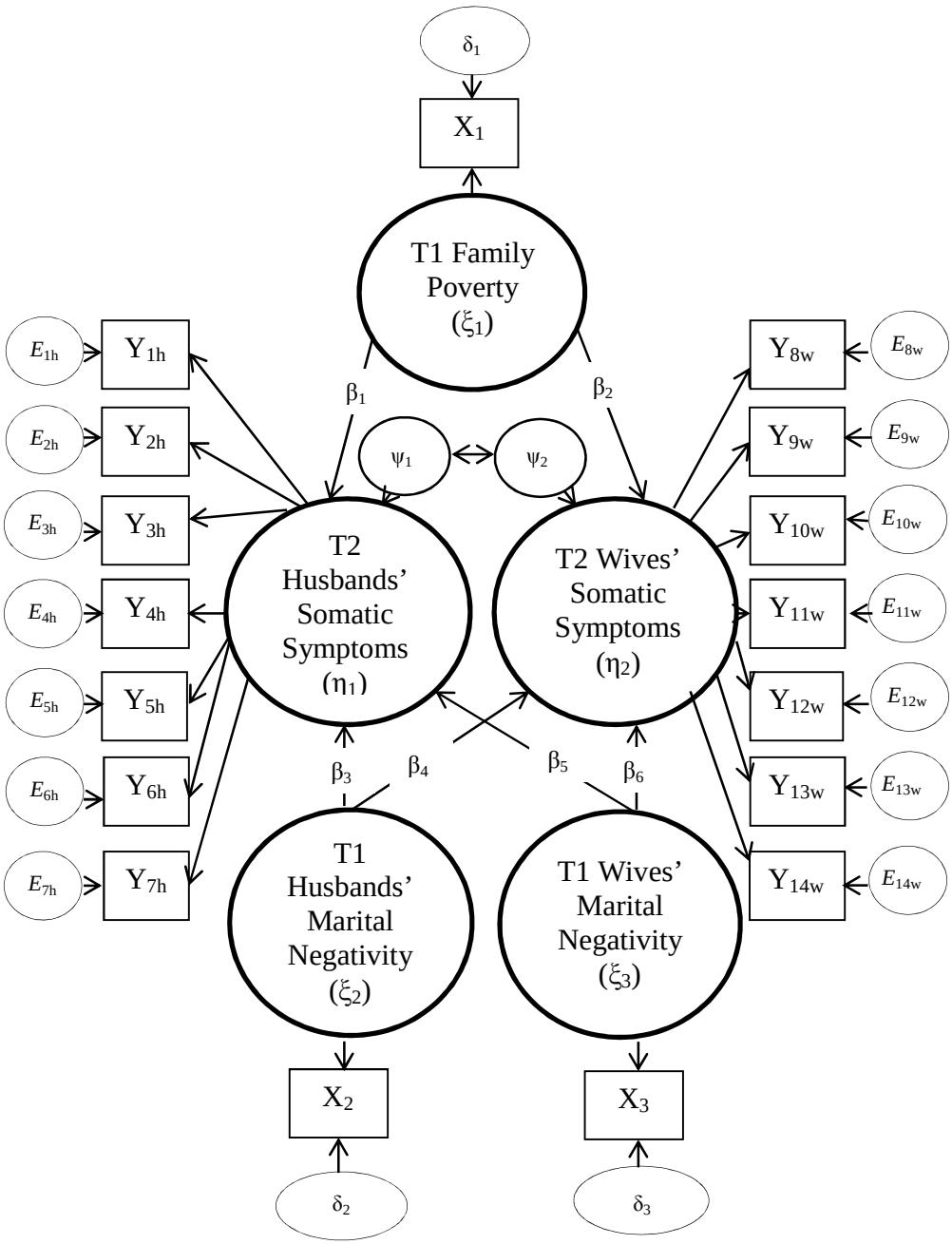

Figure 2b. Step 2: The two-intercept structural equation model. T1 = time 1; T2 = time 2. h = husbands, w = wives. Marital negativity and family poverty are pictured as being measured variables as modeled with error. To simplify the figure, covariance among the independent variables, the mean structure, and fixed values are not presented.

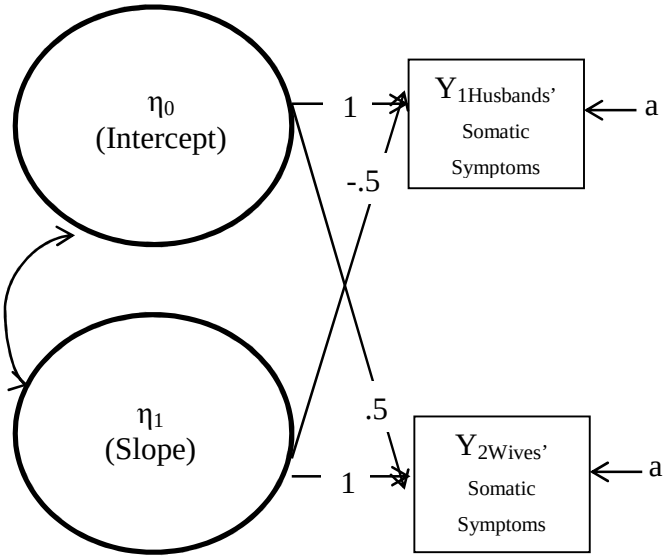

Figure 3a. Step 1: the difference approach measurement model. The letter *a* indicates that the error variances are fixed as equal. Slope values above are for the effect-coded model. The intercept represents the average score for the dyad on the dependent variable (e.g., somatic symptoms). The slope represents the difference between husbands and wives.

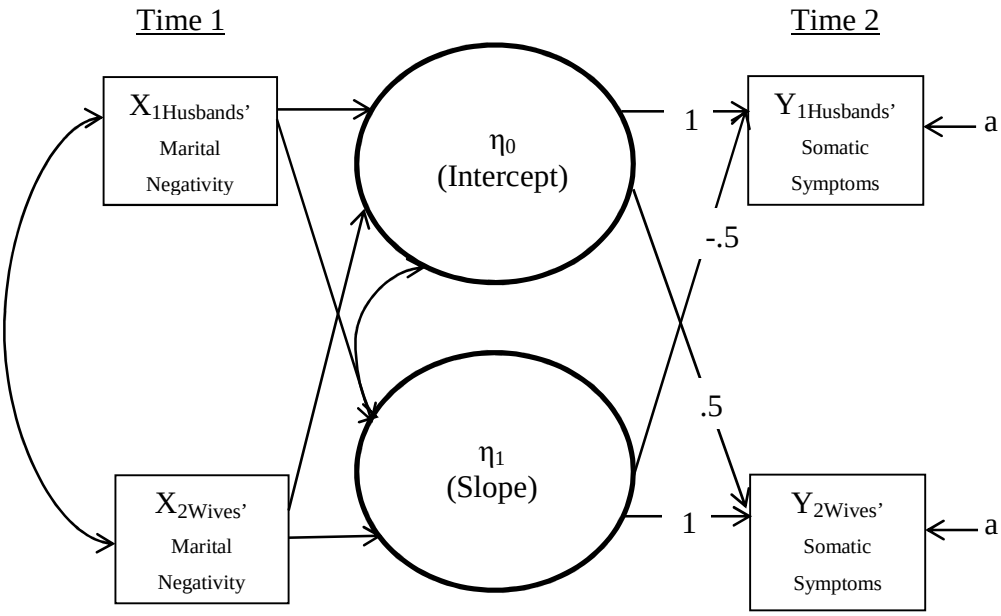

Figure 3b. Step 2: the difference approach structural equation model. The letter *a* indicates that the error variances are fixed as equal. Slope values above are for the effect-coded model. The intercept represents the average score for the dyad on the dependent variable (e.g., somatic symptoms). The slope represents the difference between husbands and wives.

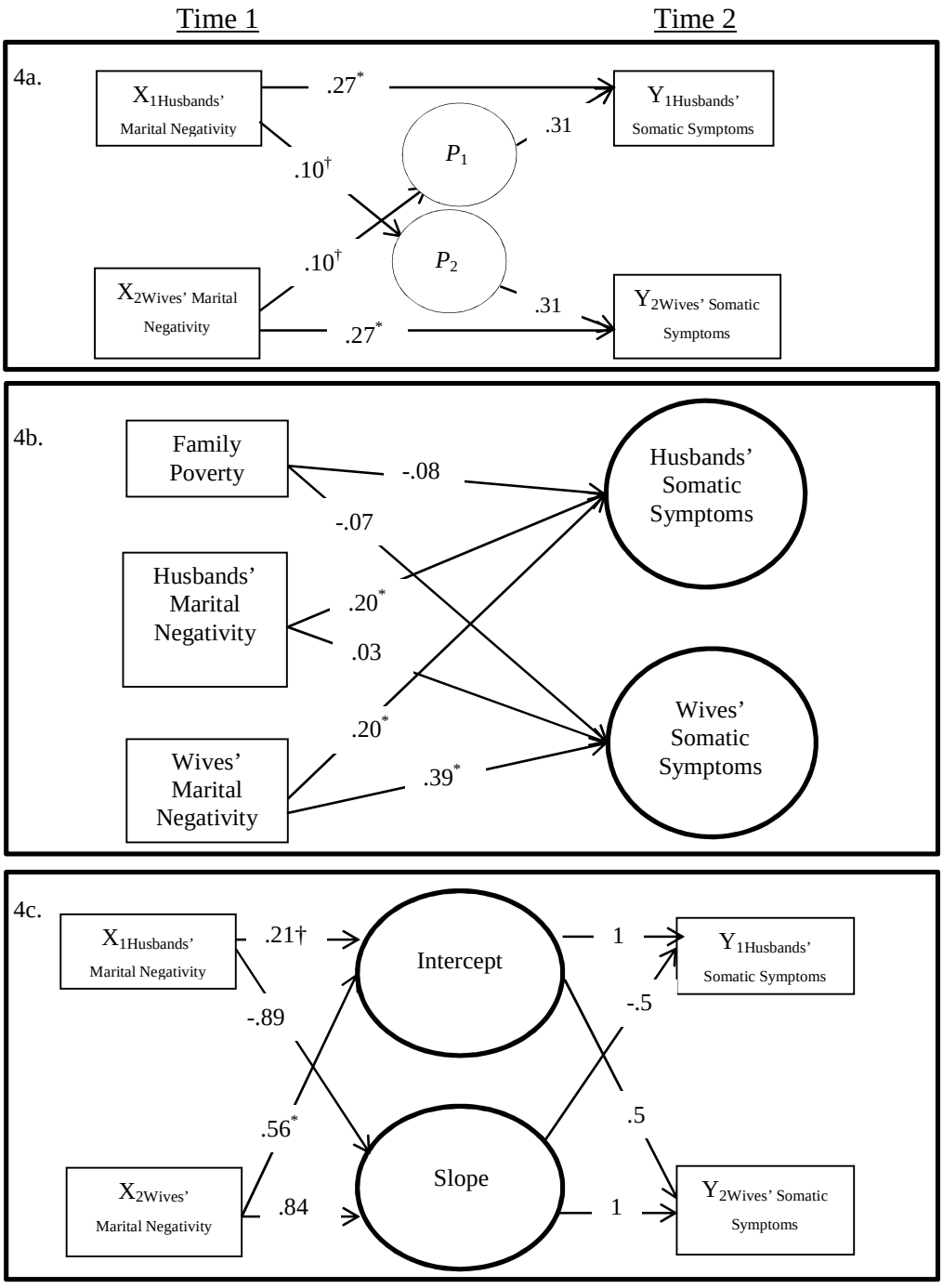

Figure 4. Somatic symptoms results across three approaches. 4a = Actor-partner interdependence approach; 4b = two-intercept approach; 4c = difference approach. For simplification, only standardized path coefficients are presented. $^{\dagger}p < .10$. $^{*}p < .05$.

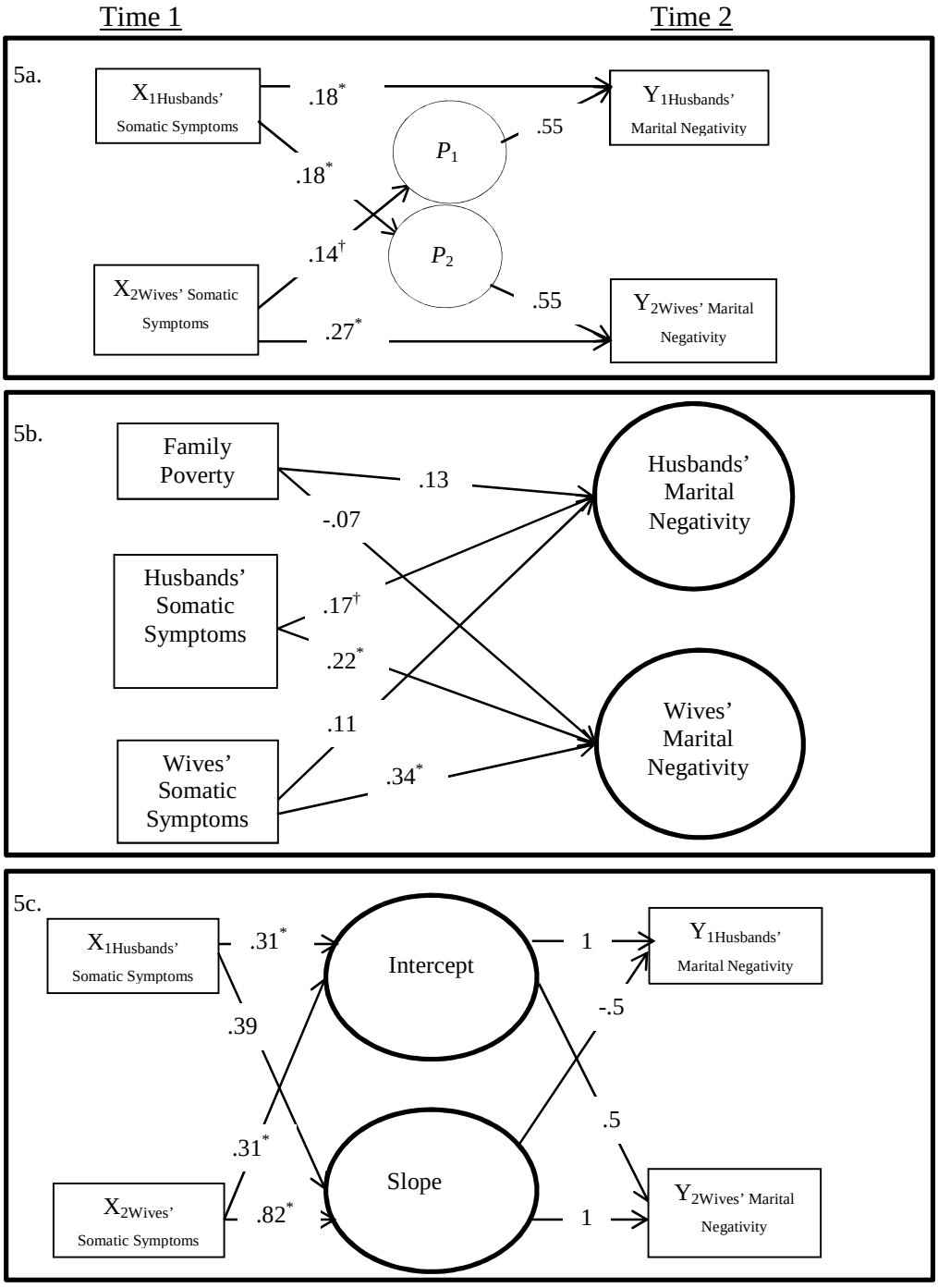

Figure 5. Marital negativity results across three approaches. 5a = Actor-partner interdependence approach; 5b = two-intercept approach; 5c = difference approach. To simplify the figure, only standardized path coefficients are presented. $^{\dagger}p < .10$. $^{*}p < .05$.

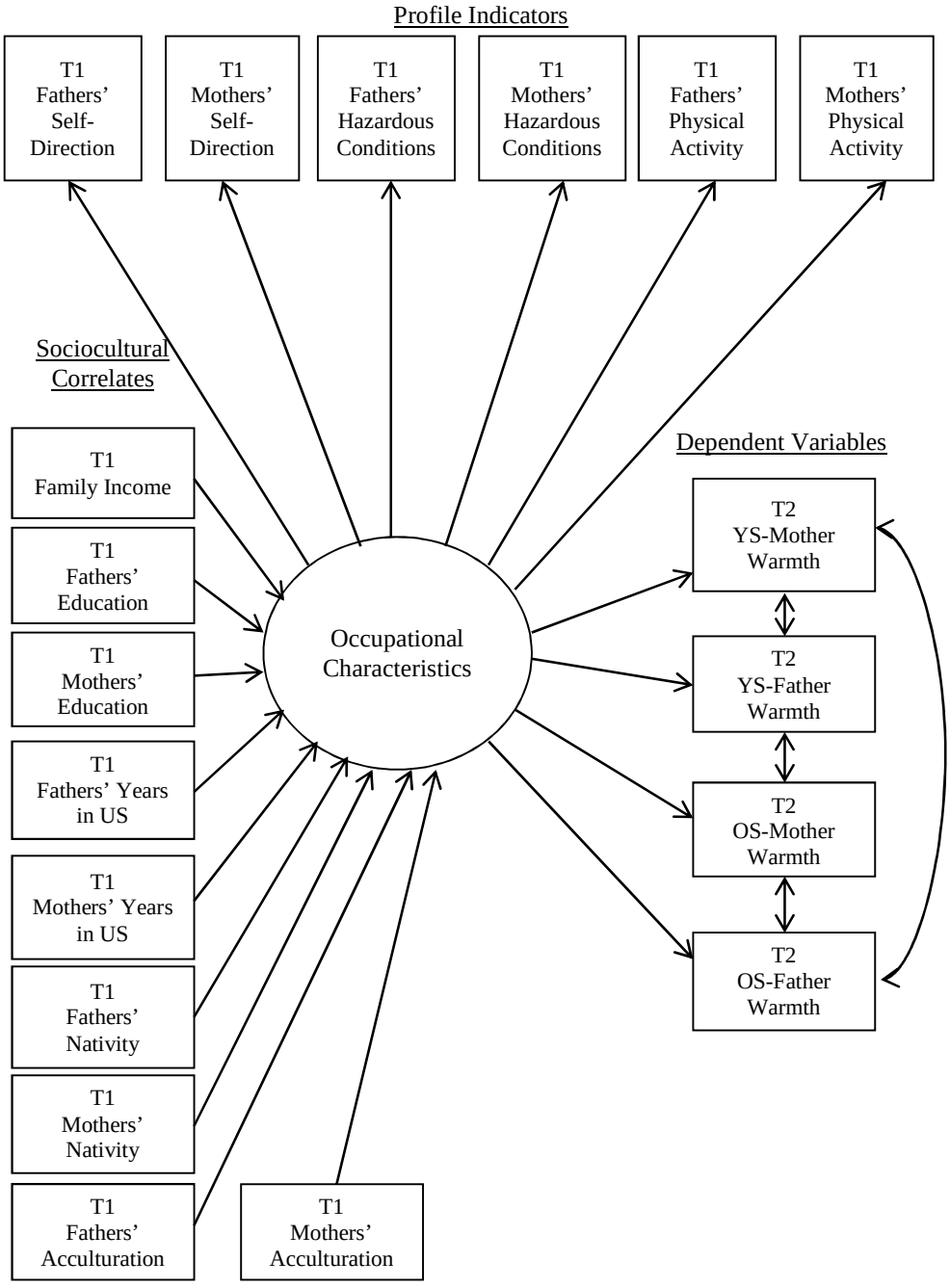

Figure 6. Conceptual latent profile model across the study goals depicting parent-youth warmth. YS = younger sibling, OS = older sibling. T2 = Time 2. There were separate models for each goal: Goal 1: identifying latent profiles; Goal 2: sociocultural correlates of latent profiles; Goal 3: latent profiles as associated with adolescent-parent warmth and nonequivalence across siblings.

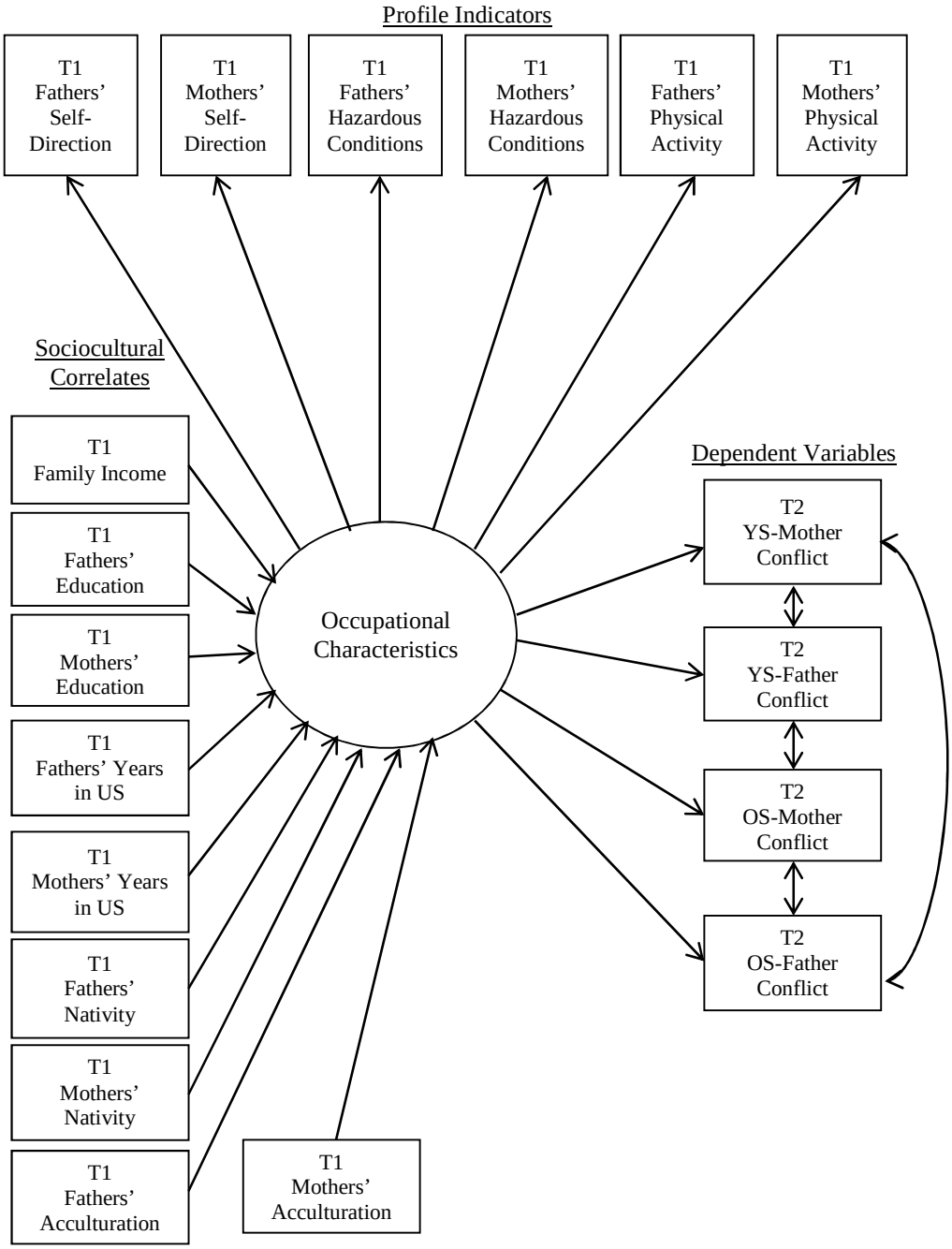

Figure 7. Conceptual latent profile model across the study goals depicting parent-youth conflict. YS = younger sibling, OS = older sibling. T2 = Time 2. There were separate models for each goal: Goal 1: identifying latent profiles; Goal 2: sociocultural correlates of latent profiles; Goal 3: latent profiles as associated with adolescent-parent conflict and nonequivalence across siblings.

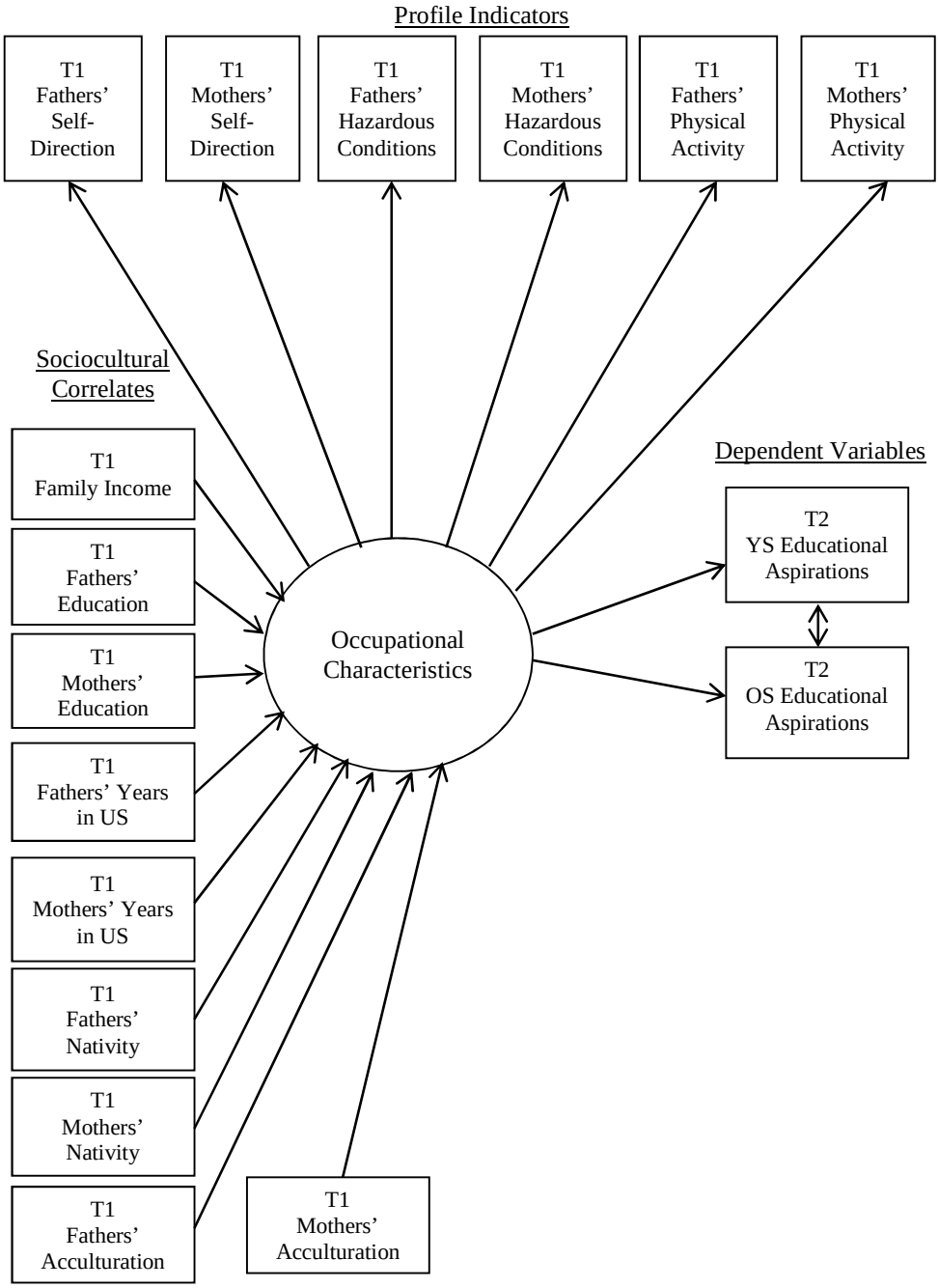

Figure 8. Conceptual latent profile model across the study goals depicting youth's educational aspirations. YS = younger sibling, OS = older sibling. T2 = Time 2. There were separate models for each goal: Goal 1: identifying latent profiles; Goal 2: sociocultural correlates of latent profiles; Goal 3: latent profiles as associated with educational aspirations and nonequivalence across siblings.

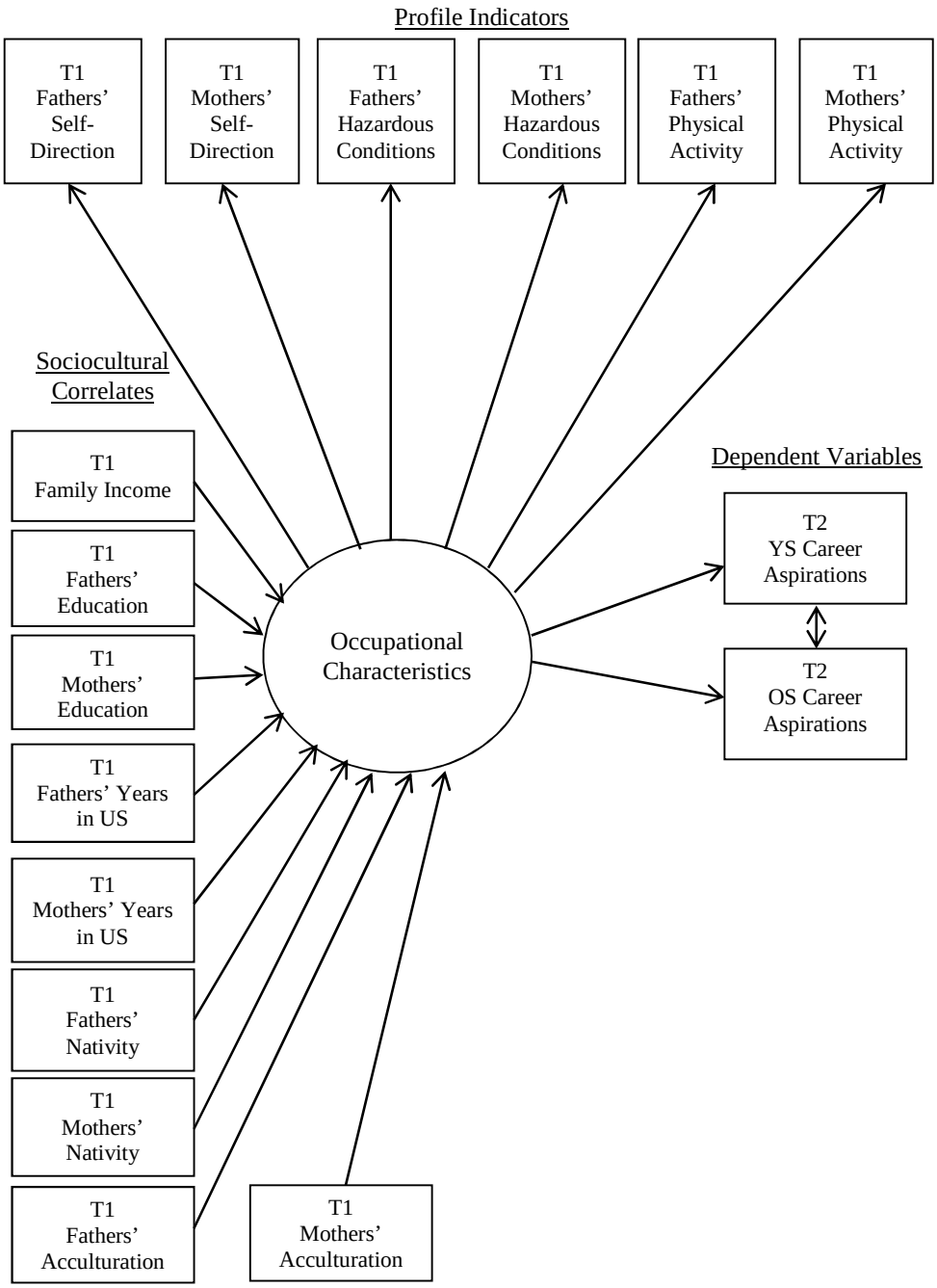

Figure 9. Conceptual latent profile model across the study goals depicting youth's career aspirations. YS = younger sibling, OS = older sibling. T2 = Time 2. There were separate models for each goal: Goal 1: identifying latent profiles; Goal 2: sociocultural correlates of latent profiles; Goal 3: latent profiles as associated with career aspirations and nonequivalence across siblings.

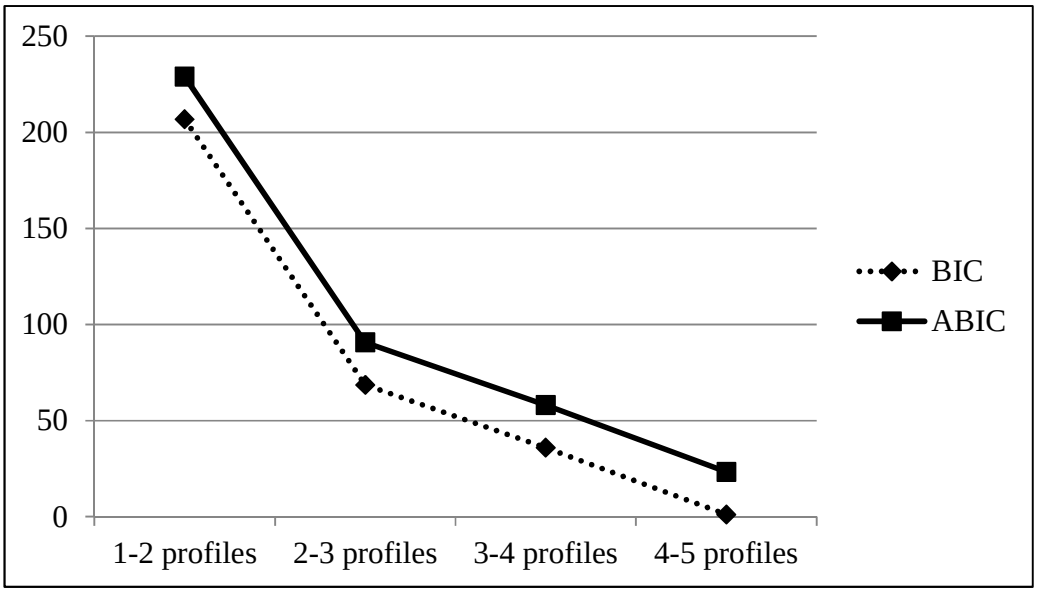

Figure 10. Change in BIC/ABIC scree plot. Change in BIC (Bayesian information criterion) and ABIC (adjusted Bayesian information criterion) from a profile solution to the next to determine the optimal profile solution.

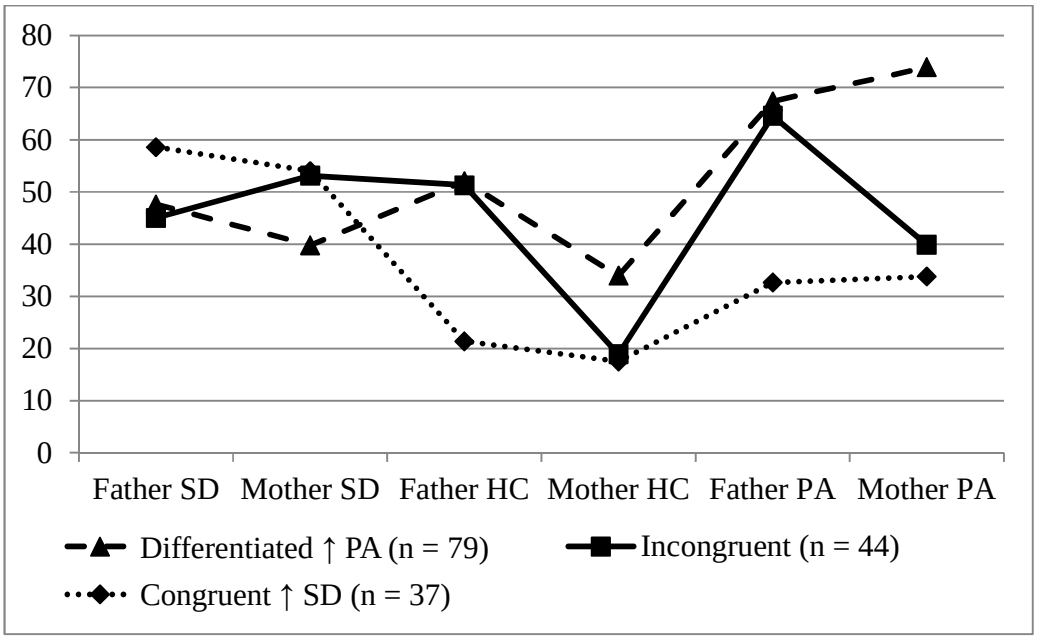

Figure 11. Class-specific profiles of means for the 3-profile solution.

APPENDIX A

INSTITUTIONAL REVIEW BOARD APPROVAL

ASU Knowledge Enterprise Development

Office of Research Integrity and Assurance

To:	Kimberly Updegraff COWDN
From:	Mark Roosa, Chair Soc Beh IRB
Date:	01/20/2012
Committee Action:	**Renewal**
Renewal Date:	01/20/2012
Review Type:	Expedited F7
IRB Protocol #:	0002001021
Study Title:	Gender Socialization in Mexican American Families
Expiration Date:	01/19/2013

The above-referenced protocol was given renewed approval following Expedited Review by the Institutional Review Board.

It is the Principal Investigator's responsibility to obtain review and continued approval of ongoing research before the expiration noted above. Please allow sufficient time for reapproval. Research activity of any sort may not continue beyond the expiration date without committee approval. Failure to receive approval for continuation before the expiration date will result in the automatic suspension of the approval of this protocol on the expiration date. Information collected following suspension is unapproved research and cannot be reported or published as research data. If you do not wish continued approval, please notify the Committee of the study termination.

This approval by the Soc Beh IRB does not replace or supersede any departmental or oversight committee review that may be required by institutional policy.

Adverse Reactions: If any untoward incidents or severe reactions should develop as a result of this study, you are required to notify the Soc Beh IRB immediately. If necessary a member of the IRB will be assigned to look into the matter. If the problem is serious, approval may be withdrawn pending IRB review.

Amendments: If you wish to change any aspect of this study, such as the procedures, the consent forms, or the investigators, please communicate your requested changes to the Soc Beh IRB. The new procedure is not to be initiated until the IRB approval has been given.

Please retain a copy of this letter with your approved protocol.