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# Contributions of Matrilineal and Patrilineal Kin Alloparental Effort to the Development of Life History Strategies and Patriarchal Values: A Cross-Cultural Life History Approach

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## Abstract

Childrearing behaviors are often shaped by familial and cultural principles that function as guides for socialization goals and effective childrearing practices. For an increasing number of Latino families, the extended kin often acts as a source of childcare support. Due to a scarcity of research on the familial support configurations of Latin American families, the current study utilizes a cross-cultural retrospective approach to explore the associations between matrilineal/patrilineal kin and life history strategies in relation to childrearing. Applying a family system and life history framework, the present model tested 200 university students from Mexico and Costa Rica on measures of family emotional environment and traditional social values (e.g., *familismo/simpatía* and patriarchal values). Results found that childcare assistance from patrilineal and matrilineal kin was associated with positive family emotional environment, which weakly mediated the association between kin care and slow life history. Positive associations were also found between matrilineal kin childcare and traditional Latin social values. However, patriarchal values were only predicted by higher levels of patrilineal kin aid. The results are consistent with the general theoretical literature of life history theory and family systems theory, suggesting that high levels of childcare produce positively emotional family climates, which in turn perpetuate the development of prosocial individuals with slow life history strategies. Implications for further research are discussed.

## Keywords

life history theory, evolutionary psychology, Costa Rica, Mexico, patriarchal values, familism, parenting, family emotional climate

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Research examining support configurations of Latino families often discuss the importance of extended family as a source of childcare. Scholars posit that ethnic minority families in the United States (including Latino families) seek social and childcare support from extended family, and that family research should empirically reflect this trend (Barnett, 2008; Harrison, Wilson, Pine, Chan, & Buriel, 1990; Sarkisian, Gerena, & Gerstel, 2007). Unfortunately, there is a paucity of research examining the familial support configurations of Latin American families. The current study retrospectively examines matrilineal and patrilineal support configurations of college students in Mexico (Hermosillo, Sonora) and Costa Rica (San José, Valle Central), and generates hypotheses based on an integration of evolutionary-psychological theories with those derived from standard social science models.

## Life History Theory

Childcare behavior emerges similarly among actors (e.g., parents, relatives, etc.) whereby time and energy is devoted toward directly assisting in the protection, socialization, nourishment, and long-term survival of children (Cabeza De Baca, Figueredo, & Schlomer, 2012; Sotomayor-Peterson, Cabeza De Baca, Figueredo, & Smith-Castro, 2013). The *motives* of the childcare differ based on the caregiver's *relationship* with the child. According to *life history theory* (Ellis, Figueredo, Brumbach, & Schlomer, 2009), organisms have a finite amount of material and energetic resources that they must devote to either *somatic effort* (e.g., growth and maintenance) or *reproductive effort* (e.g., mating and parenting). Individuals who focus more on somatic effort are considered *slow life history strategists*, as they developmentally delay maturation to adequately grow and acquire the skills necessary to navigate their social ecology (Flinn, 2006; Geary & Flinn, 2001). Conversely, *fast life history strategists* forgo energetic allocation toward somatic effort to mature rapidly and reproduce quicker. When mothers and fathers care for their children, it is described as *parental effort* (Cabeza De Baca et al., 2012; Sotomayor-Peterson et al., 2013). Any amount of energy devoted toward parental effort forgoes investment in other areas such as *mating effort*, whereby energy is utilized to find and retain mates, and *somatic effort*, whereby energy is utilized toward maintenance and growth of the individual (Ellis et al., 2009). Accordingly, life history strategies have implications for the quality of parenting (operationalized as amount of parental effort expended) the organism displays to their offspring (reviewed below).

## Helpers at the “Nest”

When individuals invest time and energy toward parental effort, the relationship of the caregiver to the child influences the amount and motives of caregiving. *Kin Selection theory* (Hamilton, 1964) posits that altruism among organisms should be higher when the coefficient of relatedness to the receiver and the benefits to the receiver outweigh the costs to the giver ( $rb > C$ ). This explanation makes sense when considering mothers and fathers who gain direct fitness from caring for their children and for other related caregivers, defined as *nepotistic effort*, who increase their inclusive fitness by aiding their related kin. Assisting in closely related kin in childrearing activities (i.e., providing *nepotistic* effort to their younger kin) has been defined as *alloparental care* (Hrdy, 1999, 2009). The following paragraphs will briefly explain the motives and relatedness of each of the caregivers.

The principle of inclusive fitness asserts that organisms should invest resources toward assisting the offspring of their relatives. The assumption is that one can genetically benefit by assisting closely related offspring *in addition* to their own children (Hamilton, 1964). Mothers and fathers should focus on the well-being of their children to increase their direct fitness (Hamilton, 1964; Trivers, 1972). Concealed ovulation in females produces paternity uncertainty in males, causing

males to be selective about their investment in their putative offspring (Geary, 2000; Wilson & Daly, 1992). Fathers risk wasting time, energy, and resources on another male's children if levels of paternity uncertainty are high.

Paternity uncertainty can also discourage paternally related relatives to invest in care of offspring if they suspect their putative young relatives are *not* related to them. Thus, paternity uncertainty would cause a sex-biased investment pattern among relatives: Maternal kin should be more likely to invest in the offspring of their relatives—and at higher levels—than paternal kin, who have two degrees of paternity uncertainty. Despite the looming uncertainty of paternity, we should expect to see assistance in childrearing among both sides of the family. Assistance in the childrearing of closely related children, known as *nepotistic effort*, is a form of alloparental support (Hrdy, 1999) that may alleviate the mother's burden of childrearing to older kin such as grandmothers or to aunts (i.e., sisters of the mother). In addition, male kin, either directly or indirectly, may assist in childrearing. Empirical research does indeed support the differential patterns of investment between kin lines (Michalski & Shackelford, 2005; Pollet, Nettle, & Nelissen, 2007). In a Western Dutch sample, researchers found that maternal grandmothers were most likely to keep in contact with grandchildren, even as distance increased, in comparison with paternal grandparents (Pollet et al., 2007). Among minority households (mainly African American households), maternal grandmothers have been shown to be pivotal alloparental figures, with some scholars suggesting the presence of a grandmother in an ecologically harsh environment may provide the cues for a faster life history strategy (Burton, 1990; Geronimus, 1996; see Jones, Zalot, Foster, Sterret, & Chester, 2007, for a discussion on the impact of maternal grandmothers on single-mother African American households). Based on the results of previous research (Michalski & Shackelford, 2005; Pashos & McBurney, 2008; Pollet et al., 2007), we will specifically ask participants about the amount of parental effort they received from grandmothers and uncles from maternal and paternal lines.

## Family Systems Framework

*Family systems framework* emphasizes that members within a family are complex and interdependent components of several relationship subsystems comprising a larger system that are highly sensitive to the functioning of the other subsystems within the entire system (Cox & Paley, 2003; White & Klein, 2002). Thus, scholars who utilize a family systems framework emphasize families should be studied as a complex unit. Furthermore, family systems frameworks emphasize contextual hierarchy, where subsystems reside within a larger system nested within a social/cultural ecology (Cox & Paley, 2003; White & Klein, 2002). One criticism family systems theory has received from feminist approaches is that it may not capture family dynamics in other socio-cultural ecologies other than those where the nuclear family (i.e., father, mother, and children) is the normative type or structure. Feminist scholars argue the analyses may be biased to favor men over women and children starting from the point that resources and power within families are unequally distributed. Based on this perspective, this limitation questions family system theory's applicability to study ethnic and minority families (Whitchurch & Constantine, 1993). This is consistent with Barnett's (2008) assertion, which suggests that studies should reflect the role that extended family has on ethnic minority families' childcare support and dynamics. In the present study, we seek to ameliorate this criticism by incorporating extended kin as members of the family system that contribute toward childcare.

One common family subsystem is the mother–father relationship. Coordination and agreement between mothers and fathers regarding parental effort is known as *coparenting* or *shared parenting* whereby the caregivers of the child (in this case mothers and fathers) work as a cohesive unit to rear the child (Cabeza De Baca et al., 2012; Stright & Bales, 2003). When there are low levels of childrearing cooperation and coordination between the parental figures, the support

unit would be said to have low-quality coparenting. A recent meta-analysis found that, among Westernized populations, higher levels of cooperation and agreement between parents has been associated with lower levels of externalizing and internalizing behaviors and higher social functioning in children (Teubert & Pinquart, 2010).

Coparenting research on low-income Mexican American mothers and fathers of toddlers yielded results similar to research on White families (Sotomayor-Peterson, Figueredo, Christensen, & Taylor, 2012). Couples who reported a high-quality coparental relationship reported higher levels of positive emotional family climate. Furthermore, the study included contextual variables *in addition* to coparenting. High-quality coparenting and positive emotion climate was associated with couples who reported higher levels of endorsement of traditional Latino-specific social values (*familismo* and *simpatía*, defined in the next section). Sotomayor-Peterson and colleagues (2013; Study 2) retrospectively examined coparenting and family environment in samples of United States, Mexican, and Costa Rican students. In addition, the researchers attempted to integrate family systems and an evolutionary framework by including measures of life history strategies in addition to family/parenting measures. Participants who reported to be slow life history strategists recalled residing in households with high levels of coparenting between their mothers and fathers. Participants additionally recalled higher levels of positive family environment and reported more parental effort among both parents (Sotomayor-Peterson et al., 2013). A study conducted on low-income, high-risk Mexican mothers with young children found that the relationship between slow life history strategies and positive parenting was mediated by an ecological protective factor (e.g., Exosystem, neighborhood security; microsystem, partner support; ontosystem, self-esteem; Gaxiola Romero, Frías-Armenta, & Figueredo, 2011). Furthermore, studies conducted in Hermosillo with a similar at-risk and control sample of mothers revealed that positive attitudes toward punishment, parental authoritarianism, and depression undermined positive parenting by predicting higher levels of harsh parenting (Frías-Armenta, Sotomayor-Peterson, Corral-Verdugo, & Castell-Ruiz, 2004). Other studies with Hermosillo mothers found that the maternal authoritarian parenting—a predictor of harsh parenting—was predicted by family dysfunction (Frías-Armenta & McCloskey, 1998).

Support for the relationship between cultural systems, childrearing practices and individual differences involving Costa Rican data has been provided by several researchers (see Rosabal-Coto, 2012, 2013, for a review). Survey studies have shown that Costa Rican mothers tend to socialize their children toward values such as being well-mannered, obedient, and respectful and (Miranda & Rosabal-Coto, 1997) that family networks play an important role in socialization goals and practices (Rosabal-Coto, 2009).

A cross-cultural study by Keller et al. (2004) found that rural Cameroonian Nso mothers were more likely than Costa Rican mothers, and Costa Rican mothers were more likely than Greek mothers, to use a parenting style characterized by body contact and body stimulation. This parenting style is believed to facilitate child obedience, respect, and regulation. Consequently, they found that Cameroonian Nso toddlers displayed more regulated behaviors than Costa Rican toddlers, and Costa Rican toddlers were in turn more regulated than Greek toddlers, as indicated by their acquiescence with maternal requirements and prohibitions.

A recent study by Kärtner, Borke, Maasmeier, Keller, and Kleis (2011) in Costa Rica and Mexico found that the effect of family type (nuclear vs. extended) on children's self-recognition and self-regulation skills were partly mediated by their parent's theories of socialization goals.

The studies briefly reviewed provide support that contextual family (e.g., family emotional environment, parenting, and coparenting), cultural measures (e.g., traditional Latino social values and cultural models of infancy), and individual differences (e.g., in depression and self-regulation) may be developmental cues for the life history strategy of the children and their parents.

## Special Sociocultural Characteristics of Latin America

Shared parenting is shaped by cultural principles that function as guides for socialization goals and parental ideas about what constitutes effective childrearing behaviors (Keller, 2003, 2011). In terms of their cultural features, Latin American countries have been described as collectivistic cultures, in which community, shared interests, tradition, public good, and the maintenance of harmony are valued over personal satisfaction (Hofstede, 2001). Latin American cultures also tend to place more importance on traditionally feminine values such as group affiliation (as opposed to personal achievement), and stress traditional gender role identification as compared with individualistic societies (Kagitçibasi, 2005; Keller et al., 2006).

From the perspective of those approaches that try to overcome the dichotomy of individualism and collectivism, it has been argued that socialization goals are intrinsically related not only with the specific ecocultural context but also with the economic context (Keller et al., 2004). These approaches point out that changing sociodemographic ecologies alter sociocultural values and childrearing practices that then lead to distinct developmental pathways (Greenfield, 2009). Therefore, we assume that global social and economic change has resulted in progressive modifications of traditional Latin American values, leading to increasing variability within and across Latin American cultures.

For instance, a meta-analysis by Oyserman, Coon, and Kimmelmeier (2002) found that while individuals from Costa Rica and Venezuela were more collectivistic than individuals from United States were (as expected by IND-COL models), individuals from Argentina, Chile, Colombia, Peru, and Puerto Rico were even more individualistic and less collectivistic than individuals from the United States were.

A more specific within-region study by Green, Deschamps, and Páez (2005) on subdimensions of IND-COL found that interdependence and noncompetition were more frequent in wealthier South American nations (Argentina and Chile), while competitiveness was dominant among people from less affluent South and Central American countries (Colombia, El Salvador, Perú, and Venezuela), a cultural-ecological pattern consistent with life history theory (Belsky, Steinberg, & Draper, 1991; Ellis et al., 2009; Figueredo & Jacobs, 2010).

These authors suggest that disparities on wealth and affluence between these countries may play an important role in shaping their cultural expressions. In fact, differences across Latin American countries are more visible in sociostructural variables as Gross National Income (GNI), Per Capita Income, or the Gender Inequality Index (GII). For instance, Brazil is one of the most well-developed, Westernized, and wealthiest countries in South America. It has one of the lowest infant mortality rates in South America and has been a social democracy for a relatively long period (World Bank, 2012). However, Nicaragua's GNI per capita is estimated to be approximately US\$1,500, making it the poorest country in Central America and the second poorest country in the Western Hemisphere after Haiti with 42% of Nicaraguans population living below the poverty line (World Bank, 2012). In other social indicators, Nicaragua also ranks among the lowest in the region. The 2011 Human Development Index (HDI) score for the country is 0.589, placing it 129th place (out of 187 countries) and its Global Gender Gap Index rating for 2011 was 0.7245, placing it 27th among 135 countries (Organization for Economic Co-Operation and Development, 2012).

Although Mexican and Costa Rican contexts and realities are not as divergent as those showed between Brazil and Nicaragua, Mexico and Costa Rica exhibit important differences in structural and cultural features that made them suitable for cross-cultural comparisons within the collectivistic cultures and testing our hypothesis.

For instance, gender inequality is generally somewhat higher in Mexico than in Costa Rica (Hausmann, Tyson, & Zahini, 2010). In 2008, Costa Rica showed an overall GII of .50 and was placed 51st among 169 countries. México, however, had a higher GII of .58 and was placed 68th

(United Nations Development Program, 2008). In addition, the literacy rate, participation in the workforce, and percentage of women in parliament is higher in Costa Rica than for women in Mexico (Hausmann et al., 2010).

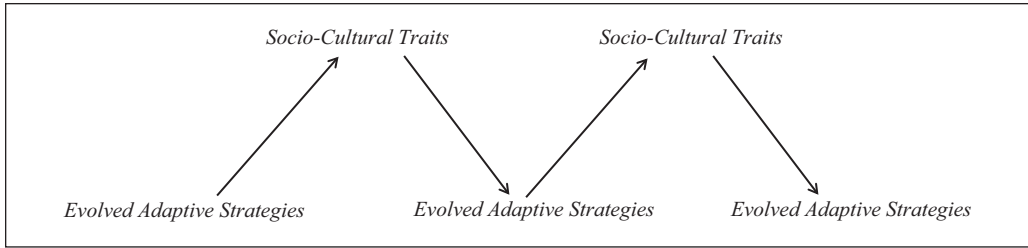
Thus, structural data support the idea that the higher degree of gender equity in Costa Rica might contribute to more egalitarian conceptions of gender roles, influencing parenting practices. Higher levels of educational attainment, the increasing participation of women in the politics (including a female as head of the State), and the growing incorporation of women into Costa Rican's labor market might contribute to parenting practices that do not resemble those of the Mexican parents.

In sum, Latin American countries are far away from being a homogeneous set of economic, social, and cultural structures. However, Latin American culture is often homogenized, ignoring that many groups are aggregated within the term. Thus, cultural components that are often associated, wholly, with "Latin culture" may emerge differently if the values are examined *between* or *within* cultures (Carlo, Roesch, Knight, & Koller, 2001).

One component of traditional Latino culture (especially among Mexicans and Mexican Americans) that is purported to exist by scholars is the concept of *machismo* that emphasizes structured gender roles between men and women and a rigid power hierarchy where men dominate, at the family- and societal level (Cromwell & Ruiz, 1979). Despite this widespread belief, many scholars emphasize that the concept of *machismo* may be overemphasized (Cromwell & Ruiz, 1979; Torres, Solberg, & Carlstrom, 2002). Still other scholars argue that concept of *machismo* among Latino cultures may have become denigrated when utilized by mainstream researchers (Mirandé, 2004) and the "positive" components of the term ignored (Mayo, 1997). Thus, for the current study we conceptualize *patriarchal values*, which perpetuates *machismo* and the adherence to a male-centric hierarchy, to be an individual difference variable whereby individuals may be higher or lower on these values, regardless of the cultural context, similar to Figueredo et al. (2001).

We further conceptualize *familismo* and *simpatía* as individual difference variables, noting that there may be variation regarding the amount of endorsement of these values. *Familismo* is defined as "solidarity, devotion, and family-centered concern" while *simpatía* focuses on the "tendency to seek harmony in interpersonal relations" (Sotomayor-Peterson et al., 2013, p. 622). Utilizing a life history framework, it could be predicted that variation in life history strategies in Latin America will emerge through endorsement of "traditional social values" such as *familismo/respeto* and *simpatía*. Indeed research finds that higher endorsement of *familismo/respeto* and *simpatía* was associated with higher coparenting (Sotomayor-Peterson et al., 2012). Further research finds that personality and behavioral measures of slow life history (Mate value inventory, Sociosexuality Orientation Inventory, and Mini-K), when composited with measures of *familismo* and *simpatía* yield high part-whole correlation loadings, suggesting that the measures may be capturing the same latent construct (Sotomayor-Peterson et al., 2013). Additional research finds evidence that *familismo*, typically associated with Latino cultures, may be applicable to various ethnic groups (Schwartz, 2007). Schwartz (2007) found factorial invariance in latent structures and nonsignificant mean differences in mean levels of *familismo* among Latinos, Whites, and Blacks in Miami.

Though we have stressed the conceptualization of sociocultural values as individual differences, having samples from two Latin American countries (i.e., Mexico and Costa Rica) we can measure value differences *between* the samples. We hypothesize that sample differences in levels of parental effort will manifest as differences in cultural values. Based on past research (Sotomayor-Peterson et al., 2013), we expect to see *lower* levels of parental effort in the Costa Rican sample in comparison with the Mexican sample. Consequently, such differences in traditional social values will also be manifested in different levels of *familismo* and *simpatía*, where Mexico will exhibit higher levels of endorsement for both values.



**Figure 1.** General culture-gene coevolution model.

## Theoretical Integration: Gene-Culture Coevolution

Human development is guided by genetic and environmental influences, which are in a constant state of mutual *transaction* with each other (Johnson, Turkheimer, Gottesman, & Bouchard, 2009). Because an important part of the developmental environment is shaped by the surrounding cultural *milieu*, it also stands to reason that the cultural environment is in a state of perpetual and reciprocal transaction with the genetic heritage of any individual within society. This process also occurs at the evolutionary level over longer periods of time, and is referred to as the process of either *gene-culture coevolution* (Lumsden & Wilson, 1981) or *culture-gene coevolution* (Cavalli-Sforza & Feldman, 1981; Feldman & Cavalli-Sforza, 1976). The order of the terms does not matter as there is no order of priority implied.

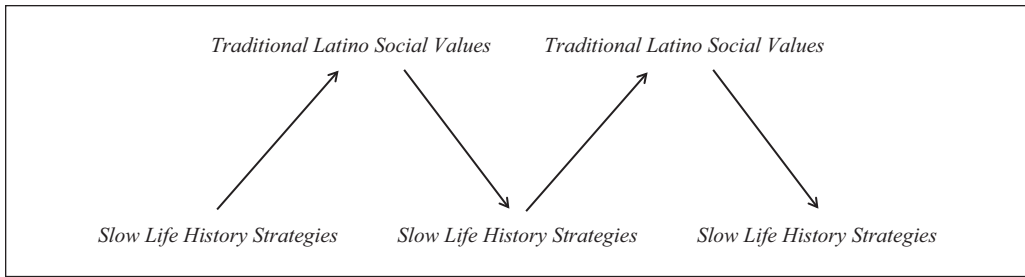
*Natural selection* is the process of adaptation through changes in the frequencies of genes in response to changes in the environmental contexts in which organisms struggle for existence. When that environmental context has sexual aspects, that aspect of the evolutionary process is called *sexual selection* (Darwin, 1871); when that environmental context has social aspects, that aspect of the evolutionary process is called *social selection* (Nesse, 2009; West-Eberhard, 1979). Social selection occurs when social interactions with other members of the same species help shape the contingencies of survival and reproduction, called *adaptive problems*, to which an organism must somehow accommodate. Because culture influences social interactions, culture therefore becomes an important causal influence in the process of social selection, at the genetic (phylogenetic) level as well as at the epigenetic (ontogenetic) level, given that environmental triggers are now known to alter gene expression.

Reciprocally, epigenetic rules of development are partially shaped by genes, which are selected over evolutionary time for responding adaptively to environmental challenges and opportunities (West-Eberhard, 2003). These epigenetic rules of development therefore encode the *evolved adaptive strategies* that influence *how* an organism will respond to any given environmental contingency it might encounter during development, and may thus influence the individual and collective adoption or rejection of *sociocultural traits*, such as norms, values, attitudes, beliefs, and behaviors (Lumsden & Wilson, 1981). Consequently, the epigenetic rules shaped by regulatory genes influence the past, present, and future frequencies of such sociocultural traits in any given population, and these reciprocal relations are shown schematically in Figure 1.

## Theoretical Rationale and Hypotheses for the Present Study

The brief reviews presented of life history theory, family systems, and Latin American culture reveal parallel conceptual points regarding the study of families: (a) research on individuals and families should include measures of context or ecology at the macrosystem level (such as nationality, ethnic group, or culture) and at the microsystem level (such as parental and kin alloparental effort), (b) the study of nuclear families does not consider other significant figures





**Figure 2.** Specific culture-gene coevolution model.

in family that may influence or shape family dynamics, and (c) the dynamics of the family could impact the development of the child through direct and indirect pathways, because components in the child's ecology may work through multiple pathways (Bronfenbrenner, 1979). These points especially applicable to minority families where familial support configurations may not include fathers but include extended family members instead; see Barnett (2008) for a review and discussion of this issue.

For example, in the model we evaluate, the quality of parenting received in childhood is hypothesized to influence the development of life history in young adults. Although life history (LH) is highly heritable ( $h^2 = .65$ ; Figueredo, Vásquez, Brumbach, & Schneider, 2004), it has been shown that the expression of these patterns of resource allocation is also partially contingent on the developmental environment (Belsky et al., 1991). LH is an evolved adaptive strategy but it is obviously influenced by the prevailing social practices of conjugal stability and quality of parenting. Applying our general culture-gene coevolution model to this specific class of adaptive problem encountered during development, these reciprocal relations are shown schematically in Figure 2.

Utilizing life history theory and a family systems framework, we focus on the family dynamics of Latin American families and how they may be associated with life history orientation, traditional, social, and patriarchal values. Latinos (in their respective country of origin and in the United States) are a heterogeneous group that have considerable social/cultural variation. For this reason, the current study utilizes two Latin American college samples from Mexico (Hermosillo, Sonora) and Costa Rica (San José, Valle Central) to retrospectively report the parental effort they received in childhood from their mothers and fathers and their kin (grandmothers and uncles).

Both frameworks emphasize two distinct strengths: Life history theory provides clear testable hypotheses that inform how individual variation in traits may be the product of variation early childhood environment (Belsky et al., 1991; Cabeza De Baca et al., 2012). Family systems theory is an excellent tool for orienting researchers toward contextual and multiactor spaces, providing descriptions for the interplay between the actors and their ecological spaces (Cox & Paley, 2003). We thus hypothesize that sample differences in cultural values will manifest as differences in *simpatía* and *familismo/respeto*. We hypothesize that a slow life history strategy will be associated with higher levels of *familismo/respeto* and *simpatía*. Mexico will have higher levels of endorsement for both values. Based on past research (Sotomayor-Peterson et al., 2013) we expect to see *lower* levels of parental effort in the Costa Rican sample in comparison with the Mexican sample. Because the study is focusing on patrilineal and matrilineal lines of kin effort, we hypothesize that the matrilineal kin will be associated with slower life history, directly and indirectly, and will buffer from reported parental harshness in the household. Based on assortative mating, we predict that patrilineal kin effort will have similar (albeit, weaker) patterns as matrilineal kin effort.

**Table 1.** Study Demographics.

Sample	<i>n</i>	Age ( <i>SD</i> ) <i>ns</i>	% female	Maternal age at participant's birth ( <i>SD</i> ) <i>ns</i>	Paternal age at participant's birth ( <i>SD</i> ) <i>ns</i>	% divorced	% widowed	Maternal education <sup>a</sup> ( <i>SD</i> ) <sup>b</sup>	Paternal education ( <i>SD</i> ) <sup>b</sup>
San José, Valle Central, Costa Rica	97	21.36 (4.75)	68.04	26.61 (7.89)	29.55 (9.76)	19.59	4.12	4.62 (2.28)	4.95 (2.50)
Hermosillo, Sonora, México	103	20.79 (3.21)	71.84	26.68 (6.71)	29.55 (7.73)	15.53	2.91	5.77 (2.08)	6.21 (2.36)

<sup>a</sup>Education Level score: "5" = less than 12 years of schooling, "6" = 12 years of schooling, "7" = associate's degree, "8" = bachelor's or RN degree.

<sup>b</sup>Statistically significant demographic difference.

## Method

### Participants

The current study included 200 participants (103 from Mexico; 97 from Costa Rica). The participants were predominately female (70%; 30% male) with the mean age of the participants being 21.07 ( $SD = 4.04$ ). Father's and mother's age during the participants' birth was 29.55 ( $SD = 8.72$ ) and 26.64 ( $SD = 7.29$ ), respectively. Ethnic breakdown for the Costa Rican sample was White (*Blanco*) 36.08%, Costa Rican of African descent 3.09%, Indigenous 8.25%, Mestizo 42.27%, Other 6.19% choose not to respond 3.09%, and missing 1.04%. Ethnic breakdown for the Mexican sample was White (*Blanco*) 15.53%, Mexican of Asian descent 1.94%, Indigenous 12.62%, Mestizo 64.08%, Other 0.97% choose not to respond 2.91%, and missing 1.94%.

Table 1 presents a breakdown of the demographics by sampling location. Participant age, mother's age at first birth, father's age at first birth, mother's and father's educational level were examined for statistical differences. ANOVAs revealed significant mean differences for mother's educational level,  $F(1, 196) = 14.40, p < .0002$ , and father's educational level,  $F(1, 194) = 13.15, p < .0004$ . Age,  $F(1, 196) = 0.98, p = .32$ , and mother's and father's age at participant's birth were nonsignificant,  $F(1, 191) = 0.00, p = .95$ ;  $F(1, 181) = 0.00, p = .99$ . Birth parents' current relationship status for Costa Rican participants was 11.34% never married, 63.92% married, 19.59% divorced/separated, 4.12% widowed, and 1.03% missing. Birth parents' current relationship status for Mexican participants was 81.55% married, 15.53% divorced/separated, and 2.91% widowed.

### Procedures

Participants in Costa Rica and Mexico were recruited via psychology research pools or during courses in their respective universities and were awarded extra credit for their participation. A paper-and-pencil research packet that was translated into Spanish (all measures have been previously utilized in Spanish; see Sotomayor-Peterson et al., 2013) was administered to the participants. Participants were asked to recall the amount of parental effort received in childhood, the family emotional climate they experienced, and measures of life history, patriarchy and parental harshness.

### Measures

**Aggregation of measures.** Multiple indicators were unit-weighted (Gorsuch, 1983) to create factors for the analyses. Unit-weighted factors have been shown to be a valid approach toward creating factors (Bobko, Roth, & Buster, 2007; Cohen, 1990; Einhorn & Hogarth, 1975). Table 2 presents means and standard deviations for the indicators of the factors prior to standardization.

**Table 2.** Means and Standard Deviations for the Indicators of the Factors Prior to Standardization.

Construct	Indicator	San José, Valle Central, Costa Rica				Hermosillo, Sonora, México				
		Male	Female	F <sup>a</sup>	Total	Male	Female	F <sup>b</sup>	Total	F <sup>c</sup>
Patrilineal Kin effort	Father's parental effort	1.84 (1.20)	2.68 (1.25)	9.72	2.41 (1.29)	2.60 (1.35)	3.09 (1.15)	3.42	2.95 (1.22)	9.12*
	Paternal grandmother's parental effort	0.23 (0.36)	0.46 (0.69)	3.08	0.39 (0.61)	0.65 (0.81)	0.47 (0.64)	1.47	0.52 (0.69)	2.04
	Paternal uncle's parental effort	0.13 (0.25)	0.22 (0.50)	1.04	0.19 (0.44)	0.55 (0.72)	0.42 (0.68)	0.70	0.46 (0.69)	10.04*
Matrilineal Kin effort	Mother's parental effort	2.69 (1.01)	3.12 (0.87)	4.72	2.99 (0.93)	2.92 (0.83)	3.47 (0.90)	8.19	3.32 (0.91)	6.51
	Maternal grandmother's parental effort	0.31 (0.35)	0.69 (0.76)	0.00	0.69 (0.76)	0.87 (0.76)	0.98 (0.84)	0.39	0.95 (0.82)	5.24
	Maternal uncle's parental effort	0.69 (0.76)	0.35 (0.47)	0.15	0.33 (0.44)	0.59 (0.73)	0.56 (0.71)	0.04	0.57 (0.71)	7.61
Harshness category	Maternal harshness	0.61 (0.80)	0.56 (0.80)	2.25	0.83 (0.97)	0.66 (0.81)	0.52 (0.69)	0.76	0.56 (0.72)	5.07
	Paternal harshness	1.00 (1.11)	0.93 (1.03)	5.06	0.70 (0.93)	0.84 (0.89)	0.50 (0.78)	3.87	0.59 (0.82)	0.69
Family emotional climate	Positive expression	0.36 (0.70)	0.61 (0.75)	2.28	0.53 (0.74)	0.51 (0.53)	0.94 (0.71)	8.65	0.82 (0.69)	8.30
	Negative expression	-0.02 (0.80)	-0.20 (1.07)	0.72	-0.14 (0.99)	-0.16 (0.87)	-0.57 (0.74)	5.84	-0.46 (0.80)	6.05
Slow life history	Mini-K	1.02 (0.72)	1.34 (0.59)	5.48	1.24 (0.65)	1.07 (0.52)	1.62 (0.44)	29.31*	1.47 (0.53)	7.64
	GFP	-0.07 (0.62)	-0.10 (0.53)	0.05	-0.09 (0.56)	-0.05 (0.50)	0.09 (0.48)	1.79	0.05 (0.49)	3.74
	HKSS	0.95 (0.43)	0.98 (0.49)	0.09	0.97 (0.47)	0.89 (0.49)	1.19 (0.45)	8.57	1.10 (0.48)	4.14
	SF-36	76.94 (13.03)	71.59 (13.28)		73.30 (13.37)	81.96 (11.10)	76.42 (12.07)	4.58	77.98 (12.02)	6.84
Traditional social values	<i>Familismo</i>	-0.02 (0.51)	-0.14 (0.41)	1.69	-0.10 (0.45)	0.09 (0.37)	0.27 (0.32)	6.20	0.22 (0.35)	33.30*
	<i>Simpatía</i>	0.72 (0.58)	0.91 (0.45)	3.10	0.85 (0.50)	0.84 (0.51)	1.12 (0.47)	7.59	1.05 (0.50)	8.03
Patriarchal beliefs	Patriarchal beliefs	0.36 (0.34)	0.32 (0.45)	0.25	0.33 (0.41)	1.06 (0.73)	0.64 (0.61)	8.75	0.75 (0.67)	28.61*

Note. Standard deviations for the means are denoted within the parentheses. Alpha values were adjusted based on Bonferroni's correction (.05 / 17 = .003). GFP = General Factor of Personality; HKSS = High-K Strategy Scale; SF-36 = Short Form-36 Health Survey.

<sup>a</sup>An asterisk denotes a significant mean sex difference in Costa Rican sample.

<sup>b</sup>An asterisk denotes a significant mean sex difference in Mexican sample.

<sup>c</sup>An asterisk denotes a significant mean difference between Costa Rica and Mexico.

**Matrilineal kin effort.** Matrilineal kin effort was measured with a 30-item short form (one for each of the target figures; e.g., mother, grandmother, uncle) measure of the *Parental Effort scales* (Cabeza De Baca et al., 2012; Sotomayor-Peterson et al., 2013). The measure asked participants to retrospectively rate the frequency of the parental tasks on three time scales (once daily to once weekly, for example, "Talking to us about our personal problems"; 5 times a week to once a month, for example, "Taking us to movies"; Yes or no, for example, "Talking to us about things going on in the world"). The three scales were aggregated for each person and then unit-weighted to create a matrilineal kin effort factor. Interitem consistency and part-whole correlations are as follows: mother ( $\alpha^{CR} = .92$ ,  $\alpha^{MX} = .93$ ; part-whole  $r^{CR} = .73$ , part-whole  $r^{MX} = .60$ ), maternal grandmother ( $\alpha^{CR} = .95$ ,  $\alpha^{MX} = .95$ ; part-whole  $r^{CR} = .81$ , part-whole  $r^{MX} = .80$ ), and maternal

uncle ( $\alpha^{\text{CR}} = .93$ ,  $\alpha^{\text{MX}} = .97$ ; part-whole  $r^{\text{CR}} = .64$ , part-whole  $r^{\text{MX}} = .84$ ). Sample items on the scale were “Praising someone for good work” and “Being angry when someone is careless.” The coefficient of congruence between the two samples for the matrilineal kin effort factor was 1.0.

**Patrilineal kin effort.** Patrilineal kin effort was measured with a 30-item short form (one for each of the target figures; for example, mother, grandmother, uncle) measure of the *Parental Effort scales* (Cabeza De Baca et al., 2012; Sotomayor-Peterson et al., 2013). The measure asked participants to retrospectively rate the frequency of the parental tasks on three time scales (once daily to once weekly; 5 times a week to once a month; Yes or no). The three scales were aggregated for each person and then unit-weighted to create a patrilineal kin effort factor. Interitem consistency and part-whole correlations are as follows: father ( $\alpha^{\text{CR}} = .95$ ,  $\alpha^{\text{MX}} = .96$ ;  $r^{\text{CR}} = .80$ ,  $r^{\text{MX}} = .66$ ), paternal grandmother ( $\alpha^{\text{CR}} = .96$ ,  $\alpha^{\text{MX}} = .96$ ;  $r^{\text{CR}} = .79$ ,  $r^{\text{MX}} = .87$ ), and paternal uncle ( $\alpha^{\text{CR}} = .96$ ,  $\alpha^{\text{MX}} = .97$ ;  $r^{\text{CR}} = .79$ ,  $r^{\text{MX}} = .87$ ). The coefficient of congruence between the two samples for the patrilineal kin effort factor was .98.

#### Positive family emotional expressiveness

**Family emotional expressiveness.** Family emotional expressiveness (Halberstadt, 1986) was assessed with a 12-item scale (7 items created a positive emotional expressiveness  $\alpha^{\text{CR}} = .77$ ,  $\alpha^{\text{MX}} = .74$ ; part-whole  $r^{\text{CR}} = .75$ , part-whole  $r^{\text{MX}} = .81$ ; and 5 items created negative emotional expressiveness,  $\alpha^{\text{CR}} = .67$ ,  $\alpha^{\text{MX}} = .76$ ; part-whole  $r^{\text{CR}} = -.87$ , part-whole  $r^{\text{MX}} = -.86$ ). Both questionnaires utilized a 5-point scale ranging from 0 = *never* to 4 = *always*. Sample items on the scale were “praising someone for good work” and “being angry when someone is careless.” Higher scores on positive emotional expressiveness denoted a more positive emotional climate while higher scores on negative emotional expressiveness denoted a more negative emotional climate. The coefficient of congruence between the two samples for the positive family emotional expressiveness factor was 1.0.

#### Harshness

**Paternal and maternal harshness.** Measures of paternal and maternal harshness (Jouriles, Mehta, McDonald, & Francis, 1997; Straus, 1979;  $\alpha^{\text{CR}} = .90$ ,  $\alpha^{\text{MX}} = .89$ ; part-whole  $r^{\text{CR}} = .84$ , part-whole  $r^{\text{MX}} = .85$ ;  $\alpha^{\text{CR}} = .92$ ,  $\alpha^{\text{MX}} = .86$ ; part-whole  $r^{\text{CR}} = .85$ , part-whole  $r^{\text{MX}} = .80$ , respectively) was collected utilizing four items for each parent from the Conflict Tactics Scale (CTS). The scale ranged from *very unlike* (0) to *very like* (3). A sample item on the scale was “Did your mother, Push, grab, or slap you?” Higher scores indicated more harshness. The coefficient of congruence between the two samples for the harshness factor was 1.0.

#### Traditional social values

**Familismo/respeto.** *Familismo* and *respeto* (18 items;  $\alpha^{\text{CR}} = .72$ ,  $\alpha^{\text{MX}} = .57$ ; part-whole  $r^{\text{CR}} = .81$ , part-whole  $r^{\text{MX}} = .78$ ) was measured utilizing an adapted q-sort measure from Wozniak, Sung, Crump, Edgar-Smith, and Litzinger (1996) that was used in Sotomayor-Peterson et al. (2013). *Familismo* and *respeto* was measured on a 4-point scale ranging from *strongly disagree* (0) to *strongly agree* (3). A sample item on the scale was “Family members should be able to rely on one another.”

**Simpatía.** *Simpatía* (10 items;  $\alpha^{\text{CR}} = .65$ ,  $\alpha^{\text{MX}} = .66$ ; part-whole  $r^{\text{CR}} = .85$ , part-whole  $r^{\text{MX}} = .90$ ) was measured using a modified measure previously used in Sotomayor-Peterson et al. (2013) adapted from Griffith, Joe, Chatham, and Simpson (1998). The scale was measured on a 5-point scale ranging from *not important* (0) to *extremely important* (4). A sample item on the scale was “Show good manners and be polite no matter what.” The coefficient of congruence between the two samples for the traditional social values factor was 1.0.

### Slow life history strategy

**General Factor of Personality (GFP).** The GFP (Rushton, Bons, & Hur, 2008) is an indicator of slow life history. Higher scores on the GFP indicate more prosocial characteristics (e.g., openness, extroversion, conscientiousness, etc.) that are more common in slow life history individuals and is attributed to social and sexual selection of these prosocial traits over time (Figueredo et al., 2006; Rushton et al., 2008). The Ten-Item Personality of Inventory of the Big Five personality (TIPI; Gosling, Rentfrow, & Swann, 2003) was used to measure the GFP. Items were appropriately coded in which high scores reflected higher endorsement of prosocial personality variables ( $\alpha^{CR} = .49$ ,  $\alpha^{MX} = .49$ ; part-whole  $r^{CR} = .59$ , part-whole  $r^{MX} = .42$ ). The scale ranged from *strongly agree* (−3) to *strongly disagree* (3).

**Short Form Health Survey (SF-36).** A general measure of health was collected on the sample using the Medical Outcomes Study (MOS) SF-36 (Ware, Kosinski, & Keller, 1994) that consisted of 36 items ( $\alpha^{CR} = .88$ ,  $\alpha^{MX} = .88$ ; part-whole  $r^{CR} = .99$ , part-whole  $r^{MX} = .99$ ). The scale was varied but was typically on a 3- or 5-point scale. A sample item on the scale was “In general, would you say your health is excellent, very good, good, fair, or poor.” Higher scores of the SF-36 reflected greater ill health.

**Mini-K.** The Mini-K (Figueredo et al., 2006) was administered to measure individual differences in slow life history. The Mini-K (20 items;  $\alpha^{CR} = .68$ ,  $\alpha^{MX} = .70$ ; part-whole  $r^{CR} = .40$ , part-whole  $r^{MX} = .32$ ) is a shortened version of the *Arizona Life History Battery* (see Figueredo, Cabeza De Baca, & Woodley, 2013, for a discussion on the measurement of human life history strategies). A sample item on the scale was “I have to be closely attached to someone before I am comfortable having sex with them.”

**High-K Strategy Scale (HKSS).** Another measure of slow life history called the HKSS (Giosan, 2006) was administered to the participants ( $\alpha^{CR} = .77$ ,  $\alpha^{MX} = .82$ ; part-whole  $r^{CR} = .57$ , part-whole  $r^{MX} = .43$ ). Because the participants were from undergraduate populations, we only utilized 22 items from the scale, omitting the questions regarding marriage. The scale was on a 5-point scale ranging from *completely disagree* (−2) to *completely agree* (2). A sample item on the scale was “I would be missed by people, besides my family, if I were to die.” Higher scores on the HKSS denoted slower life history. The coefficient of congruence between the two samples for the harshness factor was .99.

### Patriarchal beliefs

**Patriarchal Beliefs.** This 11-item measure examining the endorsement of patriarchal values ( $\alpha^{CR} = .73$ ,  $\alpha^{MX} = .81$ ) was administered to participants (Figueredo et al., 2001). The scale utilized a 5-point scale where (0) denoted complete disagreement and (4) complete agreement. A sample item on the scale was “The ultimate authority in the house is the father/husband.” Higher scores on the patriarchal beliefs scale signified higher endorsement of patriarchal values.

### Statistical Analyses

Statistical analyses for the present study were conducted with SAS 9.3. Multiple indicators were unit-weighted (Gorsuch, 1983) to create factors for the general linear model (GLM) analyses. Unit-weighted factor scores have been shown to be robust estimates of differentially weighted factor scores (typically correlated  $\sim .95$ ), and they also tend to generalize better across independent samples (Bobko et al., 2007; Einhorn & Hogarth, 1975). To assess measurement equivalence of constructs between Costa Rican and Mexican samples, part-whole correlations were computed correlating the unit-weighted factor scores to their corresponding indicators and compared across the samples utilizing coefficients of congruence (Gorsuch, 1983).

*Cascade modeling* (Figueredo, Garcia, Cabeza De Baca, Gable, & Weise, 2013; Figueredo & Gorsuch, 2007; Gorsuch & Figueredo, 1991) was conducted using PROC GLM within SAS 9.3. Cascade regression modeling involves a series of regressions that are sequentially entered based on the “conceptual causal order” the researcher hypothesizes to exist, with the variable before “causing” the next variable (see Sotomayor-Peterson et al., 2013, for an example of cascade modeling in cross-cultural research). Variables that were included in the prior steps are included in the next step, controlling for the indirect effects of prior variables. To produce more rigorous results, the GLM sums of squares were estimated using Type 1 sums of squares (SS1), whereby variables are sequentially ordered to give the first variable “causal” preference, with each variable following decreasing residual sums of squares and increasing model sums of squares estimated from the prior variable(s). In addition, based on our theoretical interests, we have included interactions between patrilineal and matrilineal kin effort with the presence of harshness. Inclusion of product terms in cascade modeling is a valid approach (Davis, Guggenheim, Figueredo, & Locke, 2007). While past research examining sex differences have found that parenting may differ by sex (Best, House, Barnard, & Spicker, 1994), past research examining Costa Ricans and Mexicans revealed no sex differences in reporting of parental effort (e.g., Sotomayor-Peterson et al., 2013). We ran the analyses both ways (first including and then excluding sex as a predictor). The inclusion of sex of the respondent had minimal impact on the other model parameters. This is because the only significant effects of sex were on the child outcomes variables (cultural, family emotional climate, life history strategy, and patriarchal beliefs). In contrast, sex of respondent had no significant influence on any of the background predictor variables (harshness, patrilineal kin effort, and matrilineal kin effort), and thus no influence on the causal processes of principal interest in this study. To preserve model parsimony, we therefore opted to leave out sex from the present cascade model. While the substantive hypotheses of the article are answered starting in Step 4, we have decided to add Steps 1, 2, and 3 to be thorough. Specifically, Step 1 examines if there are sample differences in parental harshness. Step 2 examines whether patterns of patrilocal effort could be predicted by sample location or the presence of harshness. Finally, Step 3 seeks to predict matrilineal effort from patrilocal effort, harshness, sample, and a product term between the presence of harshness and patrilineal effort.

The following order was utilized for the factors<sup>1</sup>:

- *Step 1:* Harsh = Sample
- *Step 2:* Patri = Harsh + Sample
- *Step 3:* Matri = Patri + Harsh + Sample + Harsh × Patri
- *Step 4:* Values = Matri + Patri + Harsh + Sample + Harsh × Matri + Harsh × Patri
- *Step 5:* Positive Family = Values + Matri + Patri + Harsh + Sample + Harsh × Matri + Harsh × Patri
- *Step 6:* Slow LH = Positive Family + Values + Matri + Patri + Harsh + Sample + Harsh × Matri + Harsh × Patri
- *Step 7:* Patriarchal Values = Slow LH + Positive Family + Values + Matri + Patri + Harsh + Sample + Harsh × Matri + Harsh × Patri

## Results

The first step of the cascade model was nonsignificant,  $F(1, 198) = 3.34, p = .07$ . There were no significant differences between Mexican and Costa Rican samples in reported parental harshness ( $\beta = .26, p = .07$ ).

Model predicting patrilineal kin effort was significant,  $F(2, 197) = 6.69, p < .002$ . Harshness ( $\beta = -.10, p < .03$ ) and sample ( $\beta = -.33, p < .003$ ) were significant. Higher levels of harshness predicted lower levels of patrilineal kin effort. Mexican participants reported higher levels of patrilineal kin effort in comparison with Costa Rican participants.

The next cascade model predicting matrilineal kin effort was significant,  $F(4, 195) = 27.52, p < .0001$ . Higher levels of patrilineal kin effort significantly predicted higher levels of matrilineal kin effort ( $\beta = .49, p < .0001$ ). Harshness ( $\beta = -.09, p = .06$ ), sample ( $\beta = -.17, p = .08$ ), and Patrilineal kin effort  $\times$  Harshness interaction ( $\beta = -.08, p = .19$ ) were not significant.

When predicting for culture, the overall model was significant,  $F(6, 193) = 6.74, p < .0001$ . Standardized coefficients revealed that higher levels of matrilineal kin effort was associated with more traditional social values ( $\beta = .27, p < .0001$ ). Higher levels of harshness were associated with decreased levels of traditional social values ( $\beta = -.15, p < .03$ ). In addition, sample was associated with culture. Mexican participants, compared with Costa Rican participants, had higher levels of traditional social values ( $\beta = -.59, p < .0001$ ). Patrilineal kin effort ( $\beta = -.13, p = .50$ ), and the two product terms, Matrilineal kin effort  $\times$  Harshness ( $\beta = -.15, p = .13$ ) and Patrilineal kin effort  $\times$  Harshness ( $\beta = -.003, p = .97$ ), were nonsignificant.

Results for family positive expression of emotion as a criterion variable revealed several small but significant effects,  $F(7, 192) = 27.55, p < .0001$ . Higher levels of traditional social values ( $\beta = .02, p < .0001$ ), matrilineal kin effort ( $\beta = .32, p < .0001$ ), and patrilineal kin effort ( $\beta = .13, p < .02$ ) were associated with higher levels of family positive expression of emotion. Higher levels of harshness was associated with lower levels of family expression of emotion ( $\beta = -.49, p < .0001$ ). The significant Matrilineal kin effort  $\times$  Harshness product term ( $\beta = .34, p < .002$ ) revealed that high levels of matrilineal kin effort protects against higher levels of harshness, increasing family positive expression of emotion. Patrilineal kin effort  $\times$  Harshness ( $\beta = -.18, p < .02$ ) revealed that high levels of patrilineal kin effort and high harshness *decreased* positive expression of emotion. There were no between-sample differences ( $\beta = -.13, p = .18$ ).

The next step in the model utilized slow life history as a criterion variable,  $F(8, 191) = 3.64, p < .001$ . Higher levels of family positive expression of emotion ( $\beta = .02, p < .002$ ) was associated with slower life history while the presence of parental harshness ( $\beta = -.28, p < .01$ ) was associated with a faster life history strategy. Mexican participants had higher reported levels of slow life history in comparison with Costa Rican participants ( $\beta = -.34, p = .05$ ). Traditional social values ( $\beta = .00, p = .18$ ), matrilineal kin effort ( $\beta = .13, p = .28$ ), patrilineal kin effort ( $\beta = -.12, p = .43$ ), and the product terms (Matrilineal kin effort  $\times$  Harshness product term,  $\beta = -.09, p = .10$ ; Patrilineal kin effort  $\times$  Harshness,  $\beta = -.13, p = .13$ ) were nonsignificant.

When patriarchal values were predicted,  $F(9, 190) = 4.84, p < .0001$ , only patrilineal kin effort ( $\beta = .38, p < .0001$ ), and the sample ( $\beta = -.63, p < .0001$ ) were significant. Higher levels of patrilineal kin effort was associated with higher endorsement of patriarchal values. Mexican participants reported higher levels of patriarchal values compared with Costa Rican participants. Slow life history ( $\beta = .05, p = .16$ ), family positive expression of emotion ( $\beta = -.05, p = .32$ ), traditional social values ( $\beta = .02, p = .15$ ), matrilineal kin effort ( $\beta = -.23, p = .84$ ), Harshness ( $\beta = -.01, p = .97$ ), Matrilineal kin effort  $\times$  Harshness ( $\beta = .05, p = .57$ ), and Patrilineal kin effort  $\times$  Harshness ( $\beta = .01, p = .91$ ) were nonsignificant.

The variance explained for each of the criterion variables in the cascade steps is as follows: Harshness,  $R^2 = .02$ ; Patrilineal Kin Effort,  $R^2 = .06$ ; Matrilineal Kin Effort,  $R^2 = .36$ ; traditional social values,  $R^2 = .17$ ; family positive expression of emotion,  $R^2 = .50$ ; slow life history,  $R^2 = .13$ ; Patriarchal Values,  $R^2 = .19$ .

## Discussion

Family systems theory and life history theory were utilized as complementary frameworks to elucidate the transactional nature of genetic and cultural influences on the ontogeny of life history strategies. Because social selection differentially biases which individuals are used as social role models by others, as well as which individuals favor or disfavor those agents as role models, this can shape the values and behaviors that become prescriptive and proscriptive within a

culture. Thus, the family environment can influence cultural evolution by biasing which values or behaviors are passed on epigenetically to subsequent generations by social transmission. Finally, the different fitness costs and benefits of those sociocultural traits can influence genetic evolution by favoring those individuals who are epigenetically biased toward adopting more adaptive sociocultural traits over those who are epigenetically biased toward adopting less adaptive sociocultural traits. Thus, we argue that the values and parenting practices an individual receives during childhood should impact the life history strategies one pursues into adulthood, and indirectly promotes the transmission of those values and parenting practices to the next generation. In the case of slower life history strategies, this may set up a “virtuous cycle” of intergenerational transmission of “high-quality” parental care; in the case of faster life history strategies, this may set up a “vicious cycle” of intergenerational transmission of “low-quality” parental care. The theorized causal mechanisms would be exactly the same.

The current study extended past research on Latin American families, examining the associations between parental and nepotistic effort, culture, and family environment on life history and patriarchal values. Parental and nepotistic effort was measured retrospectively in Mexican and Costa Rican college samples and composited to create matrilineal and patrilineal kin effort factors.

Results revealed that matrilineal kin effort was positively associated with higher levels of traditional social values (e.g., *familismo* and *simpatía*), and more positive family emotional climate. Higher reported levels patrilineal kin effort was also associated with positive family emotional climate. Interestingly, higher reported levels of patrilineal kin effort were associated with more endorsement of patriarchal values. Interaction terms between kin effort and parental harshness revealed two interesting (yet conflicting) results. When high levels of parental harshness are reported, high levels of matrilineal effort may serve as a buffer, allowing for higher levels of positive family expression of emotion. Conversely, higher levels of patrilineal effort may *exacerbate* high levels of parental harshness, decreasing reported positive family expression of emotion. Furthermore, the present study found no direct effect of kin effort on slow life history (only parental harshness had a direct effect on life history), but the associations between maternal and paternal kin effort and life history were weakly mediated through positive expression of family emotion, suggesting that life history strategies of the family may emerge through proximate household cues such as family emotion.

Parental harshness negatively predicted patrilineal kin effort. Furthermore, higher levels of patrilineal kin effort were associated with higher levels of matrilineal kin effort. From an evolutionary perspective, these results reveal support for possible assortative mating mechanisms in regard to parenting. Such findings are consistent with theoretical and empirical work finding evidence that individuals seek to assort with individuals with similar life history trajectories (Figueredo & Wolf, 2009; Kirsner, Figueredo, & Jacobs, 2003; S. Olderbak & Figueredo, 2009; S. G. Olderbak & Figueredo, 2010; Wolf & Figueredo, 2011). If individuals are seeking dating/mating partners assortatively, this has implications for the configuration of the household should they have offspring. If slow life history women are seeking highly invested partners, the resulting “high investing family vs. low investing kin” configuration may be the product of *maternal gatekeeping* (Allen & Hawkins, 1999; Cannon, Schoppe-Sullivan, Mangelsdorf, Brown, & Sokolowski, 2008), whereby the mother monitors and regulates the degree of involvement the father takes in his children. Thus, highly invested, prosocial fathers will be encouraged by high investing mothers to interact and engage with their offspring and low investing, harsh fathers kept away. This effect appears to be happening in the present sample, as evidenced by the Maternal kin effort  $\times$  Harshness interaction. The family configurations may also be the result of *mate expulsion*. Having a violent and antisocial partner among the top four reported reasons for conjugal dissolution in a cross-cultural sample (Betzig, 1989) and having a prosocial partner is positively correlated with marital satisfaction (Shackelford & Buss, 2000). By expelling



low-quality mates, women may be also protecting their children from experiencing harshness from their fathers. Two unexpected findings of the present study emerged involving patrilineal kin effort. Higher levels of patrilineal kin effort in the presence of high levels of parental harshness lead to a decrease in positive family emotional climate. This is consistent with the findings of Tither and Ellis (2008) that the beneficial effects of father-presence on adolescent development in young girls are negated when those fathers suffer from psychosocial dysfunction. The main difference is that our findings extend to the entire patriline rather than only the father.

While this may seem counter-intuitive and surprising, it may make sense if one considers the relevant spousal abuse literature. When Mexican women, sampled from the same study site in Hermosillo, Sonora, live in close proximity to their consanguineal kin, specifically to their male kin, the risk of spousal abuse from their partners decreases; however, if the woman lives in a patrilocal community where her only conjugal kin (i.e., the spouse's consanguineal kin) are prevalent, the risk of spousal abuse from her partner increases (Figueredo, 2001). Conversely, this same study found that if the man lives in a patrilocal community where only his male consanguineal kin are prevalent, the risk of spousal abuse toward his partner also increases (Figueredo, 2001).

Because abuse of the mother and abuse of the child are so highly correlated (Figueredo & McCloskey, 1993), it is likely that the risks associated with patrilineal kin would generalize to harshness toward the child as well. At a proximate level, because the presence of male blood relatives of the mother may serve as *deterrent* to the father's spousal abuse toward the mother, they might also do so for the father's harshness toward the child, whereas the presence of male blood relatives of the father may serve to *facilitate* the father's harshness toward the mother and the child. These effects should be especially pronounced in cultures high on *Culture of Honor*, like Hermosillo, Sonora, Mexico have been found to be (Figueredo, Tal, McNeill, & Guillén, 2004). Consequently, these effects were not found in among Costa Ricans, sampled from the same study site in San José, Costa Rica, in a subsequent study by Figueredo, Montero-Rojas, Frías-Armenta, and Corral-Verdugo (2009), due to the generally lower *Culture of Honor* found there (Figueredo, Tal, et al., 2004). Future research should seek to investigate whether culture of honor and the presence of male matrilineal kin may also be protecting the child from harshness.

### Limitations of Study

The present study highlighted the importance of examining the impact of other relatives on child outcomes (Barnett, 2008; Hrdy, 1999, 2009). The study's retrospective self-report design, however, may be a possible limitation. A more sophisticated and laborious research methodology would incorporate a longitudinal format where parental and kin effort toward childcare would be self-reported by the kin performing the childcare. The outcome would thus be child-reported life history strategies at a later time point. As highlighted before (Sotomayor-Peterson et al., 2013), ratings in retrospective self-report may reveal individual variance in personality and mood more so than childhood family environment (McFarland & Bueller, 1998). In addition, responses in retrospective self-report may be more genetically loaded, the older the child reporters are, biasing results (Ulbricht & Neiderhiser, 2009). Nonetheless, we are confident that the findings of the present study should be relatively robust. Individual differences in life history strategies are the result of environmental and genetic transactions that contribute to the behavioral/personality constellations an individual then utilizes to enact their strategies (Ellis et al., 2009; Figueredo et al., 2006). If participants are retrospectively reporting positive childhood family environments and high kin effort, this *may* be reflecting their present life history strategy (i.e., personality, attitudes, and mood), *but* is also reflecting the early environment that may have shaped that current strategy.

Another limitation of the study resides in the use of college samples. Students cannot be used incautiously as surrogates for general populations. Nevertheless, recent analyses by Flere and Lavrič (2008), based on the World Values Survey data on mean values of four sociologically and

psychologically relevant measures comparing between national and student samples of 23 countries, showed that comparisons of student samples are reliable predictors of general cross-cultural differences. This is because we can to some extent *infer* the cross-cultural differences in the general populations from those observed in student samples, given the known systematic differences between student and nonstudent samples that are fairly generalizable across cultures that *have* student populations (Henrich, Heine, & Norenzayan, 2010). Furthermore, it is possible that the gender imbalance of our volunteer sample from both countries may have biased estimates in our present model. Future research should investigate this possibility.

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### Note

1. Two sets of cascade analyses were computed, with one set giving the matrilineal variables causal preference and the other set giving patrilineal variables causal preference. Parameter estimates and significance varied little between the two sets. For brevity, only the analyses giving the matrilineal variables preference are reported.

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