

Latino Children's Behavioral Problems in Extended Family Households among Immigrant Families in L.A.

Abstract

Using the Los Angeles Family and Neighborhood Survey, this paper addresses the relationship between family extension and children's behavioral outcomes. Focusing on Latino children in immigrant families, it highlights rather ignored aspect of family contexts: extended family contexts. I examine the impact of family extension—vertical and horizontal—on children's internalizing and externalizing behavioral problems, net of crowding housing condition. Only horizontally extended households have deleterious association with internalizing behavioral problem in the OLS results. In contrast, counterfactual analysis using propensity score matching estimate gives mixed support for this suggestion, that the effects of horizontally extended family on children's internalizing behavioral problem may or may not be statistically significant, depending on the matching algorithm. Thus, extended family contexts indicate disadvantages rather than additional supports as the horizontal extension show stronger associations than do vertical extension. Nevertheless, it should be noted that the source of disadvantages most came from the low housing conditions.

Introduction

Latino children in the U.S are at high level of developmental disorders (Flores et al 2002). However, their distinctive family contexts and how the associated factors operate to influence on those children have been lacking. Children in immigrant families face different social and economic risk factors from native families. First, children of immigrant are more likely to live with two-parent and also live with non-nuclear family members involving grandparents, other relatives, and/or non-relatives in the home. Three fourths of young Latino children (77%) live with two parents (Hernandez 2007: 220), and one in five Latino children (first- and second-generation) of immigrants live with non-nuclear family members (IPUMS 2000-2012, author's calculation). While the two-parent family structure is suggested to be protective, less is examined about extended family structure. In other words, it is unknown who are more likely to live in which type of extended family (vertical vs. horizontal), whether extended family provides an additional resource or crowds out resources, and if any difference exists in the relationship by extension type. An associated factor of crowded housing conditions with extended family structure has been also omitted. Compared to 11% of children from native families live in crowded housing (more than one person per room), 47% of children from immigrant families live in such condition (Hernandez 2008; Mendoza 2009). Based on the nuclear family as the normative and standard household type, the extended family contexts and the experience of Latino children within those contexts has been neglected (Garcia-Coll and Magnuson, 1997; Suarez-Orozco, 2001). Given the increasing importance of these population and prevalence of extended family households among Latino immigrant families, this gap in knowledge needs to be filled.

This research aims to fill two omissions in previous research. First, it focuses on children with immigrant family backgrounds. Prior studies on extended family have focused on single mothers or elderly members receiving increased social support, rather than children in the house. How children in immigrant families fare in different types of extended family contexts will be examined. To more clearly capture the family influence (Chase-Lansdale, Gordon, Brooks-Gunn, and Klebanov 1997; Klebanov, Brooks-Gunn, and Chase-Lansdale, and Gordon 1997), children in earlier period are chosen. Second, it disentangles the impact of extended family from that of crowded housing condition and other socioeconomic factors. This effort is important as extended family living arrangements are often confounded with low income and crowded housing. This study hopes to contribute to existing knowledge of child development in extended family contexts as well as of children of immigrants.

Using the Los Angeles Family and Neighborhood Survey, this paper will address the relationship between family extension and children's behavioral outcomes. I first review the theoretical linkage between family contexts and child outcomes and motivations for family extension. Next, focusing on Latino children, empirical findings on the impact of family extension on children are reviewed. Based on previous studies, I test how extended family living arrangement affects children's internalizing and externalizing behavioral problems, net of low family incomes and household crowding. Discussions of findings are followed.

Latino Children's behavioral problem and Family Context

A large body of literature documents an association between a wide variety of child behavioral problems and family context (Cummings & Davies, 1994). Family-level variables that may affect child development include family structure, parental mental health status, and household socioeconomic conditions. Research shows that children reared in single-parent families are more likely to experience increased higher levels of emotional, psychological, and behavioral problems than those reared in two-parent families, (McLanahan & Sandefur, 1994, Amato, 1994). Poor socioeconomic conditions affect children's behavioral and emotional development (Bradley and Corwyn 2002 ; Brooks-Gunn and Duncan 1997) through material hardship, crowded housing conditions, and likely stressed parents (Yeung et al. 2002; Pachter et al. 2006; Gershoff et al. 2007).

Consideration of Latino immigrant family contexts

However, Latinos have been absent in child health research (Flores et al. 2002), and factors that are unique to minority populations are less explored (Pachter et al. 2006; Rijlaarsdam et al. 2013). Using Census 2000 PUMS file, Hernandez (2004) describes family arrangements for children in immigrant families. Large proportion of Latino children is found to be living with grandparents or other adult family members. About 13% of children of immigrant families live with a grandparent, which is categorized as *vertically extended family*; and about 15% of children have another relative in the home, or *horizontally extended family* (Glick 1997; Van Hook and Glick 2007). Other relatives include aunts, uncles, or cousins and older siblings ages 18 and over. Without separating the type of family extension, 27% of children in immigrant families are more likely to live with another relative in their home (versus 12% in native families). Even non-relatives, such as friends are also occasionally found. Such families account for 9% of total.

The following section reviews the motivations for family extension as well as empirical findings on the impact of family contexts including extended family household structure on child development. Household extension occurs due to situational imperatives of some family members, which include poverty, aging, single motherhood, and immigration (Harrison et al. 1990; Kamo 2000). As different types of household extension are related to different circumstances, the meanings to children are expected to differ.

Motivations for Family extension

From the economic perspective, the economic hardship of high proportions of immigrant families is the most important factor correlated with extended family formation (Angel and Tienda 1982; Harrison et al. 1990; Hemmens and Hoch 1996). Among Latino immigrant families, 26% were classified as poor, which is nearly 3 times as likely as Whites to be officially poor (26% vs. 9%) (Hernandez 2007: 223; DeNavas-Walt et al. 2008). Indeed, the poor than the non-poor are more likely to extend their households (Kamo 2000; Angel and Tienda 1982), with which horizontal extension is likely to be the case. Living with non-relatives is much more common among children whose parents have less education and part-time work (Hernandez 2004: 23). Glick and VanHook (1997: 187) found that increases in poverty among the Mexican immigrants contributed to the prevalence of horizontally extended households. By combining the resources of more than one nuclear family unit, extended family households can pool a variety of resources, or more effectively use limited resources. In this sense, household extension, especially horizontal extension involving non-relatives can be seen as financial necessity.

To increase social support is an important motivation for family extension (Hemmens and Hoch 1996; Angel and Tienda 1982; Glick and VanHook 1997; Edin and Lein 1997). Social support involves instrumental and emotional support. Instrumental support includes “material and financial assistance, practical advice, assistance with domestic tasks and responsibilities, and child care.” Emotional support includes “encouragement, affection, socializing relations, companionship, the affirmation of self-worth”, and so forth (Hofferth 1998). In this vein, it is expected that children with single parents than two-parents, the poor than non-poor families would be more likely to live in extended family households. Although vertically extended households (containing grandparents) are more common where younger children are present (12% for those ages 0-2: Hernandez 2004: 23) than where children are older (8%-9% for those ages 3-18: Ibid.), little is documented on the social support from horizontally extended family households.

From the cultural perspective, researchers emphasize strong familism that characterize the Latino family (Kamo 2000; Cauce and Domenech-Rodriguez 2000: 12). “Familism among Latinos involves strong feelings of identification, loyalty, and solidarity” (Sabogal, Marin, Otero-Sabogal, Marin, & Perez-Stable, 1987: 352; Santisteban et al. 2012). Flexibility such as the inclusion of nonrelative members (e.g. compadres) also distinguishes the Latino familism from African American or Native American extended families (Harrison 1990). It is typical for those new arrivals to double up with family or friends who already settled (Van Hook and Glick 2007). High levels of co-residence are also often viewed signaling a propensity to subordinate individual preferences or needs to those of the immediate and extended family (Sabogal et al. 1987; Kamo 2000; Rumbaut 1994; Van Hook and Glick 2007).

The Impact of Extended Families on Children Development

Due to above mentioned reasons, Latino children of immigrants in the US are more likely to grow up in various types of extended families. Thus, the implications of extended family need more investigation. Extended family members can be extra resources, as it has been documented in previous research. But, they can drain resources by lowering housing conditions or increasing stress levels. It is unknown which effects would prevail and whether they differ by the type of household extension.

Family Extension: Additional Resources vs. Crowding out Resources

Additional Resources

Children in extended families may access to additional material, human, and social capital resources (Hofferth 1998). Material support includes tangible assistance given by income, or monetary resources that can be used to purchase goods and services in a given situation. Material support can be pertinent since young Latino children have 3 times more likely to live with adult workers in the home than White counterparts (9 vs. 3%) (Hernandez 2007). Additional incomes and receipt of public assistance by extended members possibly increase the child's economic resources. The parents of children may also benefit from sharing scarce resources by doubling-up with other family or non-family members and feel less constrained in paying for housing, energy, food, and other consumable goods. As to human resources, additional family members may provide some experienced advice for mothers or take care of child by fixing meals, or helping child with home works. Social capital consists of giving "affective interaction, emotional support, counseling, instruction, and social regulation" from the relationships between (1) children and extended members and (2) parents and extended members that affect children's development (Hofferth 1998).

Especially, an extended family can be additional sources of affection, and the development of a sense of security for the children (Castiglia 1999; see Pietropinto, 1986). A limited amount of research on the direct effects of the extended family on child development has typically been focused on the effect of a grandmother's presence. Researchers suggest it may improve children's developmental outcomes, especially for the children of low-income single mother families (Deleire and Kalil 2002). Compared to children from two-parent families, children from families consisting of mothers and grandmothers, mothers and aunts, and mothers and others achieved and adjusted adequately (Kellam, Ensminger, & Turner, 1977; Kellam, Adams, Brown, & Ensminger, 1982). In a recent study focusing on the presence of grandmother, Dunifon and Kowaleski-Jones (2007) suggest differential racial pattern in the family extension to children. Grandparent co-residence was found to be associated with higher cognitive stimulation only for White children, while the opposite is true for Black children. The impact of co-residing grandparent or extended members to Latino children is unknown.

Relevant studies focus on the provision of support to mothers whose children have special needs. For example, extended-family members offered more assistance for mothers of children experiencing chronic pain from sickle cell anemia when the father was absent in the home (Wilson 1986; 1989; see Slaughter & Dilworth-Anderson, 1985). Mothers reported that the family members' assistance usually took the form of relieving the mother from other chores, such as cleaning, meal preparation, and transportation rather than direct assistance with the care of the

sick child. Usually the mother's mother provided instrumental services, whereas the mother's sisters offered emotional support to the mother.

Overall, previous research on the impact of family extension on children's development has been limited to grandmother's role of relieving mothers from child care, and has ignored Latino children with immigrant parents. The present study examines the direct effect of extended family on the in-habitant children, focusing on the Latino children in immigrant families. Reflecting the fact that living with kin and non-kin is more common among the Latino immigrants in the US, the measurement of extended family is broadened, rather than confined to grandmothers.

Crowding out Resources

On the other hand, family extension can lead to a crowded housing (that is, with more than one person per room, Bureau of the Census, 1994). Indeed, children in immigrant families are four times more likely than children in native-born families to live in overcrowded housing (46.9% vs. 11.4%) (Hernandez 2008). The highest levels of overcrowding are experienced by children in immigrant families from Central American (59%) and Mexico (67%). The influx of immigrants into Los Angeles increases pressures on housing (Chinchilla, Hamilton, and Loucky 1993: 58). Over 97 percent of the Central American workers covered in Chinchilla and her colleagues' survey were found to live in housing with more than one adult per room, and nearly 60 percent were in housing with three or more per room. Moreover, the reductions in overcrowding over time tend to be smaller among children in immigrant families despite their initially higher levels (Myers and Lee 1996). In sum, children in Latino immigrant families are more likely to live in extended households and in crowded conditions.

A child's behavioral adjustment and psychological health may be affected by household crowding (Solari and Mare 2012; Evans 2006; Saegert, 1982). If a child shares a space with other household members, s/he may have problems with interrupted sleep by the members' different schedules. When sound sleep keeps being interrupted, a child may suffer from concentration difficulties during the day and further behavior problems (Solari and Mare 2012). Also, due to lack of privacy all household members, including the child, may be stressed (Evans, Lepore, Shejwal, & Palsane 1998; Valins & Baum 1973). Regoeczi (2003) found that adults living in a high-density housing show "aggressive and withdrawn behavior" as a coping strategy to deal with stressful environment (Regoeczi 2003). In such environments, it is expected that children are also more likely to be aggressive and psychologically withdrawn.

Also, additional members may increase family stress levels. Parents can also be stressed by lack of space and privacy and suffer from increased chance of conflicts. In vertically extended households, there could be disagreements between parents and grandparents about parenting values and associated practices that interfere with mothers' parenting (Chase-Lansdale, Brooks-Gunn, and Zamsky 1994). Disabled or ill adults may take out valuable resources from the children, such as money, time, attention, and space. In horizontally extended households, minor relatives including nieces, nephews, cousins, and young siblings would compete for resources with a child in the home (Wilson 1986). Helps from other adult extended members are uncertain. Although they could support their families through paid work, possibly be less committed to childcare due to busy work schedules. If s/he was a recent immigrant, he could be more aspired

for independent residences. In sum, extended members can drain resources or add stresses through crowded housing conditions.

Based on the previous findings, this paper answers the major question: how do Latino children of immigrants fare in vertically or horizontally extended families and what are the effects of family extension, net of crowding housing. Because the latter effects are confounding with the former, it is crucial to distinguish the effects of family extension from those of crowding housing. Focusing on the social support provided by grandmothers emphasized in previous research, I expect favorable associations with vertically extended households. After controlling for the crowded housing condition, the beneficial effects would increase. By contrast, I expect deleterious association with horizontally extended households, focusing on economic circumstances to lead such living arrangement. I expect that any negative aspects of family extension would disappear, when the factors of crowding is controlled. I hypothesize the impact of family extension specifying two different types:

- H1-1: Latino children who live in vertically extended family structure will have favorable developmental outcome than those who live in not-vertically-extended family structure.
- H1-2: Controlling for crowding housing factors will increase the difference in outcomes between children with not-vertically extended family structure.
- H2-1: Latino children who live in horizontally extended family structure will have deleterious developmental outcome than those who live in not-horizontally-extended family structure.
- H2-2: Controlling for crowding housing factors will decrease the difference in outcomes between children with not-horizontally-extended family structure.

To examine this, I use both OLS regression models and counterfactual propensity score matching models. Note that analyses are performed on multiply imputed data used for 16-18 percent missing data.

Data and Method

Data

The data used for this study comes from the Los Angeles Family and Neighborhood Survey (LA.FANS). The LAFANS is a multi-stage stratified cluster sample, representative of 65 neighborhoods. The LAFANS is a study designed to capture family and neighborhood effects of child development and well-being. There are total 3,250 households chosen to participate in the survey, with 3,090 completing the survey. The families with children, families living in poor neighborhood, are over sampled.

In many sampled households, more than one respondent was interviewed. In each sampled household, one adult respondent was sampled at random. In households with children under age 17, a randomly selected child (RSC) was chosen to be included. If the randomly selected child had any siblings (SIB) in the household, one of his or her siblings was also randomly selected. The mother of the randomly selected child was selected as a respondent and designated the

primary caregiver, most of whom are mothers of child (father, grandparent can be the primary care giver). If the RSC's mother did not live in the household or was unable to answer questions about the child, the child's actual primary caregiver was selected as the primary caregiver respondent to provide information on the RSC. Note that the randomly selected adult and the primary care giver may be the same person in some households. If the primary caregiver is a different person than the randomly selected adult, there will also be a PCG respondent.

Los Angeles is important to study as a major destination for immigrants. In 2000, about 30% of the population was foreign born. Racially, population of about 9.5 million was 45% Latino, 31% white, 13% Asian-Pacific Islander, and 10% African American. It contains a large, concentrated, and historically mature Latino population. More than 80 percent of all Latinos in Los Angeles County are either Mexican American or Central American, and the LAFANS sample closely corresponds to this percentage (Frank 2007; see U.S. Census Bureau 2001). Due to sample size, Latino sample could not be distinguished by national-origin group, despite of the researcher's preference.

Sample

For the purpose of this study, the sample is restricted to the children whose racial/ethnic identification is Latino, and one of whose parents is foreign-born. There are total 1,126 children (RSC and SIB) aged 6-11.

Measure

Dependent Child Behavior Problems

Two measures of child development are used in this study: internalizing or externalizing behavioral problem scores. Children's internalizing or externalizing behavioral functioning represents a key developmental outcome and serves as an important predictor of maladjustment in later life with long-term associations with risky health behaviors and major depression in later life (King, Iacono and McGue 2004). The Behavior Problems Index was designed to assess children's behavior problems, including anxiety, depression, and aggression. This instrument was developed by Peterson and Zill (1986) and consists of 28 questions derived from commonly used questionnaires such as the Achenbach Child Behavior Checklist and others. It has been used extensively in studies of behavior problems in children. The BPI was reported for children aged 3 and older by the parent.

The Internalizing scale assesses the presence of withdrawn and sad behaviors. The measure consists of eleven items: felt or complained that no one loved him/her, too fearful or anxious, easily confused and/or has seemed to be in a fog, felt worthless or inferior, not liked by other children, had a lot of difficulty getting his/her mind off certain thoughts, unhappy, sad or depressed, withdrawn, and/or has not gotten involved with others, clinging to adults, cried too much, too dependent on others. Items are measured on a three-point Likert scale, "1" if the statement is often true, "2" if the statement is sometimes true, and "3" if the statement is not true. A reliability test indicates a Cronbach's alpha of .73. The Externalizing score provides a measure of the presence of aggressive and related behaviors. The 17 item are used: disobedient at school, having trouble getting along with teachers, having sudden changes in mood or feeling, rather high strung, tense and/or nervous, cheated or told lies, argued too much, difficulty concentrating; not been able to pay attention for long, bullied or has been cruel or mean to others, disobedient,

not seemed to feel sorry after he/she has misbehaved, having trouble getting along with other children, impulsive or has acted without thinking, restless or overly active; stubborn, sullen, or irritable; having a very strong temper and has lost it easily, broken things on purpose or deliberately destroyed his/her own or another's things, and demanded a lot of attention. A reliability test indicates a Cronbach's alpha of .87.

The measures of internalizing and externalizing behavior problem index scores are skewed due to the specific characteristic. Heteroscedasticity and inflated standard errors of the estimates in regression analysis resulting from skewed variables can lead to reduced statistical power of significance tests and larger confidence intervals (Berk 1983). To reduce these problems, the behavior problem scores are logged.

Family Extension

The independent/treatment variables under investigation were family extension. About 33 percent of the sampled Latino children (aged 6-11) of immigrant families are extended family households. Types of extended family households are divided into three groups: vertical, horizontal and both. Vertically extended household measures the presence of grandmother and/or grandfather in the home. About 6 percent of cases involve grandparents, either a grandmother or grandfather of the entire sample; 17 percent among the extended family households. Horizontally extended household measures the presence of adults over the age of 18 years including aunt, uncle, cousin, other relative, non-relative, and friend of householder, other than grandparents. Siblings are not included as other adults regardless of age. About 23 percent of cases are horizontally extended family households of the entire sample; 70 percent among the extended households. Both vertical and horizontal extended household contain both grandparents and other adults. About 4 percent of the entire sample are such cases; About 14 percent among the extended family households. Above-mentioned variables are dichotomous.

Covariates: Determinants of Family Extension

Considerable researchers indicate demographic and socioeconomic factors are associated with people's choosing extended family living arrangements. Such determinants includes child sex, age, and immigrant generation, housing condition, number of children, family income, parents' age, educational attainment, depressive symptom, and poverty status of residence at census tract level (very poor, poor, non-poor). Even if some variables seem distantly related to family extension, it is argued that all variables that could affect the treatment should be included in estimating propensity score, regardless of statistical significance, unless a consensus that a covariate does not affect the outcome was reached (Rubin and Thomas 1996; Rosenbaum and Rubin 1983). At the same time, these variables may be also associated with child development. Thus, these factors are critical in constructing matched groups of children in extended and not-extended family in the propensity score matching analysis.

Child sex, age, and generation First-generation immigrant children compared to second-generation children are more likely to live with extended members due to higher poverty in their families (Hernandez 2007). Parents of girls than boys might be less willing to extend their family to other members. Children's generational status is measured by the place of birth (e.g. US-born, foreign-born). Sex of child variable is dichotomous (0=female, 1=male), and age variable is continuous.

Primary Care Giver Depressive symptom Mental health of parents may be associated with family extension due to increased demands for social, emotional support. And mothers' poor mental health has been shown to adversely affect child behavior (Carlson et al. 2001; Downey & Coyne, 1990). Distressed or depressed parents are more likely to either withdraw from their children, which in turn negatively affect the mental health of their children. Children with depressed parents are found to be at a greater risk for social, emotional, and behavioral problems (Davies and Cummings 1994; Downey & Coyne, 1990).

In LA.FANS, Short Form (CIDI-SF) questionnaire covers major depressive episodes (MD) of the primary care givers. The CIDI-SF questions for MD reports the respondents' feeling sad, blue, or depressed for two weeks or more in the past 12 months (dysphoric); if they did, whether having lost interest in most things like hobbies, work, or activities that usually give pleasure (anehedonic). Those with 3 or more symptoms are "probable case" of major depression. The MD scores provide a probability that the person is suffering from major depression.

Primary Care Giver Single Parent Status Single-parent families are more likely to extend their households than two-parent families (Angel and Tienda 1982; Glick and VanHook 1997). Single-parenthood is measured with the variable about relationship with household head in LA.FANS (0= presence of husband/wife or partner 1=no husband/wife or partner).

Family income Low family incomes increase the likelihood of family extension (Glick and VanHook 1997) as well as affect children's development in many possible ways (Bradley and Corwyn 2002; Brooks-Gunn and Duncan 1997; McLoyd 1998; Teukuchi 1991). The sum of income from head of household, spouse/partner of head, children, and other income is calculated and logged for the analysis.

Crowding Housing To measure crowding housing, two approaches are used for OLS regression and propensity score matching analysis. One, persons per room, an official measure of overcrowding in housing, is calculated with the number of total household members (all adults and children) divided by the number of bed rooms, bath rooms, and other rooms. This indicator is included as a covariate in the OLS regression analysis. For propensity score matching, this cannot be included as a pre-treatment condition to predict propensity of family extension. Thus, the number of bed rooms, bath rooms, and other rooms is included in calculating the propensity scores.

Neighborhood Poverty Economic opportunities of neighborhood have been found to influence on the behavioral outcomes of children (Xue, Brooks-Gunn, and Felton 2005; Klebanov, et al. 1998; Wilson 1991). Although the association between family extension and neighborhood poverty is unknown, housing supply problem in impoverished neighborhood may increase residence sharing. The three sampling strata are identified in L.A.FANS based on the percent of the tract's population in poverty. For L.A.FANS tracts in the "very poor" category, the average household poverty rate is 50 percent; for those in the "poor" category it is 30 percent; and for those in the "not poor" category it is 10 percent. The values are ordinal: 1=Very Poor, 2=Poor, and 3=Not Poor.

Statistical Analyses

The paper uses propensity score matching method as well as Ordinary Least Square multivariate regression. Propensity score matching is used to reduce the bias in the estimation of treatment effects with observational datasets. It “corrects” the estimation of treatment effects to some extent, controlling for the existence of the confounding factors. The bias is reduced when the comparison of outcomes is performed using treated and control subjects who are as similar as possible. For the purpose of this study, family extension to non-nuclear members is not random, so the estimation of the family extension (treatment) effect in ordinary regression analysis may be biased by the existence of confounding factors.

Propensity score is defined as the conditional probability of receiving a treatment given pretreatment characteristics: $p(X) \equiv \Pr(D = 1|X) = E(D|X)$, where $D = \{0, 1\}$ is the indicator of exposure to treatment and X is the multidimensional vector of pretreatment characteristics (Morgan and Harding 2006). If the exposure to treatment is random, it is also random the values of the one-dimensional variable $p(X)$. A propensity score can be estimated with any standard probability model as far as it satisfies the balancing hypothesis: $D \perp X | p(X)$. This predicted probability is checked by comparing the equality of each covariate mean between the treatment and control cases within sets of propensity score intervals until covariate balance is achieved.

The Counterfactual Causal Framework

Unlike a multivariate regression analysis, the propensity-score matching method estimates the effect of the treatment among units that were treated, thus the estimates are directly comparable to bivariate estimates of simple differences in means or proportions. The counterfactual framework assumes that each individual in the treatment group has an observable outcome in the treatment state and an unobservable counterfactual outcome in the control state (Winship and Morgan 1999), and vice versa with those in control groups. Based on the estimated propensity scores, matching estimate indicates that if, counterfactually, those children who live in extended family households and had a given family background had not had the extended member, they would on average have experienced the same level of behavioral problems as was observed among the children who do not have a non-nuclear family member in their home but had the same family background.

By applying the distribution of characteristics of extended family households to the control group, the propensity-score estimator calculates the average effect of non-nuclear member on the children in extended family. The estimations of propensity score are obtained controlling for the following covariates: children’s sex, age, generation (US-born, foreign-born), crowding housing indicator using number of family members divided by sum of number of bed rooms, bath rooms, and other rooms in the house, logged total household income, primary care giver’s depressive symptoms or, his/her educational status, single parent status, and poverty status of neighborhood in which the family live. Primary care giver’s age, and racial/ethnic predominance of neighborhood (another indicator of neighborhood quality) are omitted due to causing unbalance to create a counterfactual group. Similarly, number of siblings and number of cousin in not included in neither multivariate regression model nor propensity matching estimates.

Given the propensity score $p(X_i)$, Morgan and Harding indicates (2006) the average effect of treatment on the treated (ATT) can be estimated as follows:

$$\begin{aligned}\tau &\equiv E\{Y_{1i} - Y_{0i}|D_i = 1\} = E[E\{Y_{1i} - Y_{0i}|D_i = 1, p(X_i)\}] \\ &= E[E\{Y_{1i}|D_i = 1, p(X_i)\} - E\{Y_{0i}|D_i = 0, p(X_i)\}|D_i = 1]\end{aligned}$$

In which a population of units is denoted by i , D a treatment, and Y expected proportion or mean of the outcome. In this framework, estimates of effects are the “effect of treatment on the treated” rather than the effect of treatment for the entire population. The estimates from the counterfactual model are estimates of the average treatment effect, rather than the effect on each individual. Thus, the treatment should not be assumed to equally affect all individuals experiencing the “treatment.”

There are several types of propensity score matching, and no literature offers guidelines for making this choice. This paper comparatively uses Radius Matching, Nearest Neighborhood matching, and Stratification matching method using `attr`, `atnd`, and `atts` commands in STATA. Radius Matching, with which each treated unit is matched only with the control units whose propensity score falls into a predefined neighborhood of the propensity score of the treated unit (Dehejia and Wahba 2002). Nearest neighborhood matching randomly orders the treatment and control groups, then selects the first treatment and finds one (two for 2 to 1 matching) control with the closest propensity score. (LaLonde 1986.) Stratification matching with which the range of variation of the propensity score is divided into intervals such that within each interval, treated and control units have, on average, the same propensity score. Then, differences in outcome measures between the treatment and control group in each interval are calculated. An average of outcome measure differences per block is obtained, weighted by the distribution of treated units across the blocks (Dehejia and Wahba 2002).

OLS models are used as comparisons to the propensity score matching models to determine whether using OLS modeling produces large differences in the coefficient estimates for the family extension and other variables relative to the propensity score matching model. Bivariate and multivariate models that control for a number of family and individual factors are used to determine whether the independent effects of family extension variable affects or is affected by the relationship between neighborhood variables and the dependent variable. A set of models controls for a number of child and family level factors (e.g. family income and indicator of crowding housing condition).

Regression analysis presents the changing association between family extension and children’s well-being with additional control variables. When a researcher concerns about the heterogeneity of a real-life treatment group population thus regards treatment cases is valued to be dropped, Basler proposes using a propensity score matching that retains the largest treatment group, while supporting the use of multivariate analysis after matching. In running a regression, the independent variables is the treatment indicator (family extension) and the same variables used in propensity score estimation are included for controls. , and by estimating the marginal effects of the treatment indicator (Basler 2006)

Model1 examines the association between extended adults and children’s behavioral problems, controlling for child characteristics. In model2, this association is examined while controlling for household level variables: family income, parental age, education, and depressive symptom, and crowding housing conditions. Third, neighborhood poverty status is additionally controlled.

Regression analysis is still useful because the effects of the matching variables on the outcome cannot be studied in propensity score matching method. For example, the changes in the effects of family extension, if any, by such as family income or crowding housing condition can be traced in a set of multivariate regression models.

Results

[Table 1]

[Table 2]

[Table 3]

[Table 4]

Table 1 shows the comparison between groups of children in extended family households and non-extended family households. The base unmatched (and unadjusted) mean of internalizing behavioral problem differ statistically significantly between the two groups ($p < .05$), but not for externalizing behavioral problem. Foreign-born children are more likely to (24 vs. 14%) to live in extended family households than US-born children in immigrant families ($p < .05$). Children in extended family households are on average living in more crowded housing conditions at statistically significant level ($p < .001$). There is no statistically significant difference between the groups of children in primary care giver's age, sex, depressive symptom, and educational attainment, living with single parent household head, family income, and residence by neighborhood poverty status.

Table 2 shows the results of multivariate regression models on internalizing behavioral problem. Model 1 presents that children living in extended family household and single parent household are more likely to be reported with higher internalizing behavioral problem. Particularly, extended family households exert statistically stronger effects on children. However, in model 2, both of these effects disappear with introduction of primary care giver's depressive symptom above family income and crowding housing condition effects. Those children with primary care giver with a higher probability of depressive symptom are 0.43 logged higher internalizing behavioral problem index scores. This implies that the single parent status and extended family effects are mediated by primary care giver's depressive symptom. In model 3, with introduction of residence in neighborhood by poverty status, the effect of living with extended families is statistically significant but the effect size does not change much. After controlling for the quality of residence, the net effects of family extension appear to be negative. Thus, the OLS regression analysis supports the negative aspects of extended family household on children's internalizing behavioral problem, even controlling for the crowding housing condition.

Table 3 shows the results of multivariate regression models on externalizing behavioral problem. Throughout model 1-model 3, structural aspects of family household such as extended family or single parent family have no effects on children's externalizing behavioral problem. Neither family income nor crowding housing condition affects children. Only primary care giver's mental health status exerts statistically significant and substantial effects. Variables at individual level continuously present significant effects. Boys than girls are about 0.20 logged higher externalizing behavioral scores. As a child ages, the externalizing behavioral scores are more likely to be decrease with logged 0.02 point. But in model 3 including neighborhood poverty

status, the age effects disappear, suggesting that residence in poverty-stricken neighborhood interacts with child development as a child grows up. This should be addressed in future study.

Table 4 reports estimates from the matching models with the radius, nearest neighbor, and stratification matching estimates. To begin with internalizing behavioral problem, the results are mixed. For radius matching estimate, it shows that the average treatment (ATT) effect is 0.13, an effect that is not statistically significant; the confidence interval, obtained by using bootstrap option, includes zero, meaning the effect is not statistically significant. For nearest neighbor the ATT 0.15, the effect is also not statistically significant; on the other hand, the ATT of stratification is 0.16, statistically significant. To compare, the size of the family extension effect for Radius matching is the most similar with the size of the OLS model. Importantly, the statistical significance of family extension effect on internalizing behavioral problem depends on the matching algorithm. The Radius matching algorithm found matches for 84% of the treatment cases compared to 100% of Nearest Neighbor and Stratification matching algorithms. But the first two estimates do not support statistical significance of the positive family extension effect. The different algorithm must have contributed to this difference. The implication of the different algorithms will be discussed in the following section. As to the externalizing behavioral problem, consistent with the OLS regression results, none of the effect of living in extended family household is not statistically significant.

Discussion

The present analyses examine the relationship between extended family and children's internalizing and externalizing behavioral problem using a propensity score matching approach as well as OLS regression, for a representative sample of Los Angeles immigrant families. The results reveal more complex picture of concerns about children in extended family living arrangement. The OLS results support that residential sharing with related or unrelated members may reduce resources for child development, increasing the stigma of shared housing closely associated with household extension. However, in contrast to the standard single-population regression model results, counterfactual analysis using propensity score matching estimate gives mixed support for this suggestion, as the "average treatment effect on the treated children" show that the positive effects of extended family on children's internalizing behavioral problem may or may not be statistically significant, depending on the matching algorithm. Except for stratification matching, estimates obtained by Radius and Nearest Neighbor matching do not render statistical significance. Radius Matching have the least number of treated cases used, or the most number of unmatched treated cases were dropped; Nearest Neighbor Matching have the least number of control cases but all treated cases used; Stratification Matching have the most number of treated and controlled cases. Which set of matching estimates should be considered more worthy? The answer is debatable depending on which value a researcher endorses: efficiency vs. bias. The estimates with complete cases are assumed to be more efficient, though more likely to be biased, while those with restricted cases less biased, though less efficient. I would argue that using restricted cases is suitable to understand the effect of family extension because of the possibility of hidden unobservable biases related to family extension not controlled. Otherwise, the result will be misleading. It is safe to require more rigorous approach to understanding family extension effect.

An issue of interpretation still remains, which attends to the unmatched treatment cases. About 80-92% of the treatment cases are matched in the analyses, depending on the matching method. Propensity score matching estimates only some of the treatment group with the robustness of the results, instead of using the entire treatment group with little confidence in the robustness (Harding 2003). Harding mentions that it is worthy of considering the consequences of leaving out unmatched control cases for the treatment cases. Since “attr” procedure in stata 13 does not allow identifying exactly which cases are included in the average treatment on treated effect estimation, I performed alternative matching procedure using psmatch, in order to better understand the unmatched treatment cases. The treatment cases that are unmatched in the matching process are those with high estimated probabilities of *living in high poverty neighborhoods, low income family households, low educational attainment of primary care giver, and more crowding housing*. It is unknown whether the unmatched cases are expected to experience a larger family extension effect than the matched. Given those unmatched are worse off in terms of socioeconomic indicators, my best guess indicates that these children might be less likely to receive extra care or affection by extended family members because they are occupied by their own living but affected by adverse living arrangement. By excluding these cases, which might be highly confounded with family extension, in estimating the ATT effects, the negative influence of family extension might disappear in the propensity score matching estimates.

More interesting would be the estimates for quintiles of the distribution of strata, based on the propensity scores of family extension. OLS regression does not allow such quantities of variation in the estimates. In the subsequent analyses (results available upon request), it is found that those children who are in the least propensity quintile to family extension are the only group affected by extended family living arrangements with statistical significance ($p < .05$).

It is known that living with relatives or nonrelatives is much more common among children whose parents have limited education and economic resources (Hernandez 2004). Hemmens, Hoch, and Carp (1996) caution the concerns about overcrowding or residential housing with relatives or non-relatives may stem from hierarchical social value on family dwellings in the US society. American society stigmatizes extended family living conditions, while placing the moral and social superiority on single family dwelling in exclusive possession of a house (Hemmens, Hoch, and Carp 1996:11-12). With a “link between a single-family home and ideal citizenship” established, it is easier for researchers to reproduce the negative social value of shared residence with extended family.

Conclusion

Children’s internalizing or externalizing behavioral functioning represents a key developmental outcome and serves as an important predictor of maladjustment in later life with long-term associations with risky health behaviors and major depression in later life (King, Iacono and McGue 2004). This paper makes three contributions to existing literature. First, it extends previous literature on family contextual effect to child development, adding extended family living arrangement in the framework. Extended family living arrangement is more commonly adopted and an important survival strategy for minority, particularly Latino immigrant families in the US. This rather ignored aspect of family contexts for children of immigrants is highlighted. Second, related to the first, it distinguishes the effects of family extension from crowding

housing. Often, the negative connotation residential sharing, such as overcrowding, is associated with extended family living arrangement. I attempt to disentangle those. Finally, it employs the counterfactual model of causality to overcome methodological limitations with standard regression analyses to examine the family influences. Even though the children living within extended family households seem to be disadvantaged in terms of behavioral development, I suggest the actual effect may not be as detrimental as it appears. Rather, matching estimate indicates that when those children living in extended family households had a given family background and had not had the extended member, there will be no difference from the level of behavioral problems they would have experienced as observed among the children who do not live with extended family members but had the same family background.

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Table1. Baseline Characteristics According to Family extension before matching (original data)

	Not extended	Horizontally Extended	Vertically Extended	Both Extended	t-value
Externalizing Behavioral Problem (ln)	1.76	1.79			0.45
Internalizing Behavioral Problem (ln)	1.29	1.45			2.51*
Child sex	0.50	0.51			0.57
Child age	9.14	9.20			-1.03
Child foreign-born	0.14	0.24			2.21*
Primary care giver's age	35.31	35.13			-0.02
Primary care giver's sex	0.00	0.01			0.83
Primary care giver's depressive symptom	0.11	0.13			1.01
Single parent household head	0.15	0.16			-0.04
Primary care giver's less than high school	0.72	0.67			-1.68
Primary care giver's high school degree	0.16	0.17			1.53
Primary care giver's some college	0.08	0.12			0.46
Primary care giver's BA degree	0.04	0.04			0.15
Family income (ln)	9.97	9.84			-0.59
Number of people per room (crowding)	1.28	1.67			6.15***
Very poor neighborhood residence	0.23	0.25			0.13
Poor neighborhood residence	0.52	0.55			1.38
Non-poor neighborhood residence	0.25	0.19			-1.60
N					

Note: All means and proportions are weighted.

Table2. OLS Results: Child Internalizing Problem Behavior

	Model 1	Model 2	Model 3
Horizontal extension	0.24*	0.23*	0.19
	[0.02, 0.459]	[0.009, 0.447]	[-0.019, 0.398]
Vertical extension	0.02	0.09	0.09
	[-0.28, 0.32]	[-0.20, 0.373]	[-0.206, 0.386]
Both horizontal and vertical extension	0.22	0.15	0.14
	[0.001, 0.44]	[-0.086, 0.383]	[-0.082, 0.369]
Single parent household head	0.17	0.13	0.1
	[-0.02, 0.37]	[-0.002, 0.262]	[0.058, 0.191]
Child sex (Ref: female)	-0.07	0.03	0.05
	[-0.21, 0.07]	[-0.058, 0.114]	[-0.044, 0.119]
Child age	-0.01	-0.01	-0.01
	[-0.022, 0.004]	[-0.021, 0.004]	[-0.018, 0.005]
Child foreign-birth	0.11	0.09	0.06
	[-0.026, 0.248]	[0-.043, 0.231]	[-0.071, 0.199]
Primary care giver's Depressive Symptom		0.43***	0.42***
		[0.283, 0.584]	[0.285, 0.480]
Primary care giver's college degree or higher		-0.04	-0.05
		[-0.367, 0.291]	[0.331, 0.416]
Family Income (ln)		-0.01	-0.002
		[-0.045, 0.242]	[-0.028, 0.030]
Very poor neighborhood (ref: not poor)			0.39***

			[0.166, 0.632]
Poor neighborhood (ref: not poor)			0.15
			[-0.093, 0.351]
Number of people per room (crowding)			-0.02
			[-0.091, 0.080]
Constant	0.96***	1.38***	1.09***
	[0.51, 1.41]	[0.961, 1.790]	[0.678, 1.494]
Observations	952	952	952
R-squared	0.03	0.06	0.10

*** p<0.001, ** p<0.01, * p<0.05

Note: Results are weighted.

Table3. OLS Results: Externalizing Behavioral Problem

	Model 1	Model 2	Model 3
Horizontal extension	0.21	0.23	0.20
	[-.008, 0.426]	[-.001, 0.442]	[-.020, 0.414]
Vertical extension	0.03	0.08	0.08
	[-.416, -.485]	[-.312, -.469]	[-.318, -.479]
Both horizontal and vertical extension	-0.26	-0.21	-0.21
	[-.812, 0.293]	[-.759., 0.337]	[-.743, 0.319]
Single parent household head	0.06	0.08	0.06
	[-0.085, 0.211]	[-0.070, 0.230]	[-0.086, 0.215]
Child sex (Ref: female)	0.17***	0.20***	0.21***
	[0.076, 0.273]	[0.105, 0.298]	[0.114, 0.307]
Child age	-0.01*	-0.02*	-0.02
	[-0.024, 0.003]	[-0.031, -0.003]	[-0.030, -0.02]
Child foreign-birth	0.14	0.14	0.12
	[-0.011, 0.288]	[-0.008, 0.287]	[-0.023, 0.269]
Primary care giver's Depressive Symptom		0.55***	0.54***
		[0.379, 0.713]	[0.373, 0.710]
Primary care giver's college degree or higher		-0.01	-0.02
		[-0.368, 0.342]	[-0.377, 0.333]
Family Income (ln)		0.01	0.02
		[-0.025, 0.052]	[-0.02, 0.054]

Very poor neighborhood (ref: not poor)			0.17
			[-0.035, 0.377]
Poor neighborhood (ref: not poor)			0.03
			[-0.178, 0.234]
Number of people per room (crowding)			0.18
			[-0.098, 0.134]
Constant	1.77***	1.53***	1.42**
	[1.622, 1.914]	[1.062, 1.990]	[0.933, 1.912]
Observations	970	961	961
R-squared	0.02	0.07	0.08

*** p<0.001, ** p<0.01, * p<0.05

Note: Results are weighted.

Table4. Radius Matching Estimates: Treatment Effect of Family Extension on Child Internalizing Externalizing Behavioral Problem

Matching type	ATT	Standard Error	t-value	N (treated/controlled)	Empirical distribution (95% bounds: lower, upper)
<i>Internalizing</i>					
Radius	0.89	0.11	1.65	102/227	(-0.03, 0.41)
Nearest Neighbor	0.15	0.11	1.42	132/112	(-0.06, 0.37)
Stratification	0.13	0.07	1.89	127/516	(-0.01, 0.26)
<i>Externalizing</i>					
Radius	0.12	0.11	0.92	148/239	(-0.09, 0.32)
Nearest Neighbor	0.08	0.09	0.861	202/150	(-0.10, 0.26)
Stratification	1.14	0.07	1.29	195/455	(-0.05, 0.21)

Note: The number of treated in the matching model corresponds to children in extended family, whereas the control group refers to children non-extended family. To obtain the propensity score, a logit specification is modeled (predicting family extension) and a radius range of 0.001. A radius of 0.0001 is not used because the sample size is reduced to 10% of the sample. Radius matching was specified using the “attr” procedure; Nearest Neighbor matching “atnd”, and Stratification matching “atts” in Stata 13 (see Becker and Ichino, 2002). The model specified bootstrapped standard errors, 500 repetitions, and was restricted to the region of common support.