

## Expanding Opportunity Structures

### Parental Investments in Education, Migration, and Extrinsic Risk Reduction among Indo-Fijians

Dawn B. Neill

**Abstract** Parental investment strategies are contingent on parental capacities and ecology. Parental embodied capital may be important in aspiration construction and investments in children's human capital, which is especially important in urban environments where skills are directly tied to wage income. For Indo-Fijians, rural ecology strongly limits opportunities. Here this limitation is conceptualized as extrinsic risk and immune to reduction through enhanced parental investment. Urban migration is interpreted as a risk reduction strategy, given an expanded urban opportunity structure (lower extrinsic risk). Qualitative and quantitative data from 678 Indo-Fijian children suggest that, contingent on parental capacities, parents migrate in response to their perceptions of decreased opportunities that manifest as high levels of extrinsic risk in rural environments. Parental investment in quality and quantity corresponds to parental perceptions of extrinsic risk, which in turn correspond to migration status, indicating that parental strategies do respond to perceived limits on investment payoffs.

Because resources invested in one aspect of growth, development, or reproduction cannot also be invested in another, trade-offs occur over the life course. Life history (LH) theory provides a framework for examining between-species and within-species patterns of resource allocation trade-offs (Ellis et al. 2009). Fundamental LH trade-offs are growth versus maintenance, current versus future reproduction, and offspring quality versus quantity (Borgerhoff Mulder 1992; Chisholm 1999; Stearns 1992). Of particular interest to the present analysis is the quality-quantity trade-off, which describes the allocation of resources across a number of offspring. A quality-

based strategy occurs when resource allocation is intensified across a few relatively “high-quality” offspring. A quantity-based strategy results from spreading resources more thinly across a relatively high quantity of offspring (Stearns 1992).

Variation in LH strategies occurs because of environmental variation and individual condition. Thus, parental investment strategies (e.g., quality versus quantity) are contingent on the LH of parents themselves, including their lifetime accumulation of skill, experience, and somatic resources, as well as current and past ecological conditions (Becker 1981; Kaplan et al. 2002; Low et al. 2008). Owing to phenotypic plasticity, individual LH strategies are expected to respond to ecologically specific opportunities and risks (Ellis et al. 2009), given individual condition (Kaplan et al. 2002). All else being equal, environments that are marked by high levels of extrinsic risk, which is risk of mortality or morbidity that is immune to reduction from increased parental effort, favor a quantity-based LH strategy, whereas lower levels of extrinsic risk tend to favor a quality-based LH strategy (Ellis et al. 2009; Quinlan 2006, 2007; Pennington and Harpending 1988).

## **Opportunities and Urbanization**

Urbanization is proceeding rapidly in many developing countries as part of a larger process of development and involves the shift of rural residents to urban cities. In 2008, for the first time in human history, the urban proportion of the world’s population exceeded the rural. This urban increase is fueled mainly by rural to urban internal migration and is ongoing. Rural population growth will become negative by 2025, and the world urban population will double by 2050 (increasing from 3.3 billion in 2007 to 6.4 billion in 2050), with most urban increase occurring in less developed regions (United Nations 2008).

Internal migrations in developing countries occur because of limits on rural land resources (VanWey 2005) and because cities seem to offer better options for employment, education, health care, public services, and entertainment (Moore et al. 2003). Rural to urban migration in developing countries is part of larger process of development and “intimately linked” to reduced land access (VanWey 2005:142). The transition from an agricultural to an industrial economy involves movement of labor out of the agricultural sector, which generally involves movement of individuals to urban areas in pursuit of wage-earning employment. Individual migrations may be motivated by potential for urban employment or by the loss or threat of loss of rural land resources. Rural land resource availability may be impacted by population growth outpacing available arable land, the fragmentation of familial landholdings, environmental degradation, or eviction (VanWey 2005). In Fiji, however, loss of rural agricultural land generally occurs when an Indo-Fijian farming family is evicted from leased farmland (Reddy and Naidu 2001). Increasing rates of eviction and land tenure uncertainty continue to fuel internal migration among Indo-Fijians.

Migration is selective, and not all rural inhabitants migrate (Curran 2002; Kanbur and Rapoport 2005; Liang and Chen 2007; Lukic and Nikitovic 2004; VanWey 2005). Potential migrants are a heterogeneous group who respond differentially to migration incentives, and their responses may be contingent on migrant capacities

since the shift from a rural to an urban ecology entails changes in patterns of employment, education, and child productivity (Neill 2007). Migration selectivity has been conceptualized as contingent on a set of environmental considerations at places of both origin and destination that serve as “push-pull factors” potentially impacted by human capital and a migrant’s ability to succeed in the urban destination (Curran 2002:94). Though urban migrants lack human capital relative to the destination community, they tend to have much higher levels of human capital than members of the origin community who remain behind (Kanbur and Rapoport 2005). Thus, the decision to migrate is determined by the costs and benefits involved in relocation (Pekkala 2003), which itself may be mediated by parental embodied capital.

Research has shown that education is positively associated with urban migration (Pekkala 2003) and that “human capital generates higher returns in urban than rural areas” (Huang et al. 2002:626). Urban returns to human capital are recognized through greater work opportunities for the college educated (Costa and Kahn 2000). In turn, the urban environment further enhances some people’s human capital by providing opportunities for workers to acquire even more skills (Becker 1962; Glaeser and Mare 2001). Alternatively, because human-capital-based firms are attracted to the growing body of human capital in urban areas, rural localities generally experience difficulty in maintaining educated workers (Sander 2006). Although the urban area is associated with greater educational attainment and an expanded range of opportunities, the rate of human capital acquisition is not uniform. In addition to high rates of educational attainment, urban areas also show high rates of school dropout (Sander 2006). It is estimated that between one-quarter and one-half of urban residents in the developing world now live in poverty (Redman and Jones 2005). One reason for this might be the marginalization of under-skilled urban residents and migrants.

## **Parental Condition**

Parental capacities (e.g., parental embodied capital) may play an important role in the development and implementation of LH strategies (Ellis et al. 2009; Kaplan 1996; Kaplan et al. 2002). Over the long period of offspring development, parental condition will impact the construction of resource allocation and expected payoffs to investment. In urban environments the attainment of human capital is tied to formal education and the embodiment of skills that facilitate the ability to earn a living in a wage-based economy (Becker and Tomes 1986; Kaplan 1996). Urban environments create changing payoffs to investment in human capital that manifest through the increased importance on educational determination of wages, which is expected to shift parental investment to a more quality-based strategy. This contention is based on Kaplan’s theory of embodied capital (Kaplan 1996; Kaplan et al. 1995, 2000, 2002). Embodied capital is the lifetime accumulation of strength, skill, knowledge, and other abilities. The theory suggests that the evolved psychological mechanism that optimizes parental investment is “sensitive to environmental variations in learning opportunities and payoffs,” thereby enabling parents to make behavioral adjustments in investments in their offspring’s learning in accordance with ecologically contingent demand for skills-based resource acquisition (Kaplan et al. 2002:234). As such, parents should be capable of altering

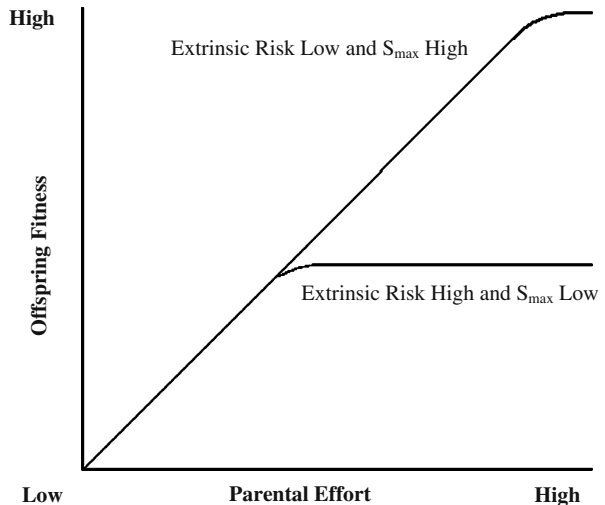
investment strategies as transitions to living in urban environments occur. Since wage income is inherently tied to learned skill sets, this in turn creates an incentive for increased investments in learning for skills-based resource acquisition. In wage-based economies, offspring quality is primarily improved through formal education and is limited by parental resources, which are themselves tied to parental education (Becker 1975; Kaplan et al. 1995).

Greater investment in education leads to changes in fertility and parental investment. As the average level of investment increases, the production of each additional offspring is more costly, leading to a lower quantity but higher quality of offspring (Becker 1981; Kaplan 1996). In urban environments exhibiting increasing payoffs to investments in education, some parents are likely to choose a high-quality strategy with long-term payoffs to investments in skill acquisition. Thus, the fitness-related currency being maximized is skill.

### Concept of Extrinsic Risk

Offspring fitness is a function of parental investment or effort, offspring responsiveness to parental effort, and the effect of extrinsic risk that is independent of parental investment. This relationship was elaborated by Pennington and Harpending (1988) using the effect of extrinsic mortality on parental effort. As shown in Fig. 1 (after Quinlan 2006; based on Pennington and Harpending 1988), increasing parental effort should increase offspring fitness up to a point defined as  $S_{max}$ , the point of saturation of parental effort. Past this point, further parental effort does not increase offspring fitness (Pennington and Harpending 1988). In environments where extrinsic risk is high, the point of saturation is reached at a lower level of parental effort, and parents are predicted to pursue a quantity rather than quality investment strategy. Where extrinsic risk is low, the point of saturation is reached at a higher level of parental effort, and a quality over quantity strategy should emerge. Extrinsic risk is care independent, which means that it is an environmental factor that

**Fig. 1** The effect of extrinsic risk on parental effort. As parental effort increases, offspring fitness also increases up to the point of saturation ( $S_{max}$ ) of parental effort. Beyond  $S_{max}$  further parental effort does not increase offspring fitness (after Quinlan 2006)



is immune to reduction through parental investment. Thus, extrinsic risk sets an ecological upper limit on the payoff to parental effort.

This relationship between extrinsic mortality and reproductive timing has been investigated by examining life expectancy and age at first birth within the United States (Geronimus 1996; Wilson and Daly 1997) and across countries (Anderson 2010; Low et al. 2008). Positive correlations indicate that lower life expectancies are associated with a quantity-based life history strategy, wherein women begin reproducing earlier and have higher numbers of children. The concept of extrinsic risk has been expanded beyond mortality to include any unavoidable factor that can reduce an organism's ability to reproduce, such as famine, warfare, and pathogen stress (Belsky 2008; Low 1988; Quinlan 2006, 2007). Similarly, research in child development has explored the effects of environmental stressors that likely indicate the presence of morbidity/mortality risk, such as marital discord, unstable pair bonds, father absence, and inadequate financial resources, on sexual maturation and reproductive strategy (Belsky et al. 1991; Chisholm 1999; Draper and Harpending 1982; Hill et al. 1997).

Though mortality presents a hazard with serious fitness consequences, other ecologically contingent hazards are also expected to affect the quality-quantity trade-off (Quinlan 2006). Local opportunity structure acts as an external limitation that makes certain types of parental investments beyond the point of saturation less worthwhile (Low et al. 2002). For this reason, opportunity structure imposes limitations in the same way as extrinsic risk. Opportunity-structure-based extrinsic risk can be defined as external limitations on returns to parental investment that are immune to reduction through increased parental effort. High-risk environments are marked by conditions of limited access to resources, such as limited job opportunities or institutionalized discrimination which might limit access to or advancement in employment (Quinlan and Quinlan 2007), whereas low-risk environments have relatively fewer restrictions on an individual's potential ability to access resources, seek employment, or otherwise maximize returns on parental investments. In environments where opportunity-structure-based extrinsic risk is high, returns to skills-based parental investments may be wasted parental effort since the opportunity structure is a care-independent factor and immune to reduction through increased parental investment. If, however, opportunity-structure-based extrinsic risk is low and investments in knowledge and skills are tied to greater long-term returns to parental investment (Becker and Tomes 1986), the point of saturation will be high and parental effort should respond. The demand for greater education in modern environments with rich and varied opportunity structures increases the payoff to parental investment in education, thereby increasing motivation to invest. Parental condition is also important in sensitizing parents to the context and value of investment and in maximizing skill acquisition through efficiency of investment (Becker and Tomes 1986; Kaplan 1996; Kaplan et al. 2000).

Here, I examine the effect of parental embodied capital and opportunity-structure-based extrinsic risk on parental investment decisions in rural non-migrant, urban non-migrant, and migrant Indo-Fijian families. It is suggested that parental investment responds to ecologically contingent extrinsic risk. This is measured by comparing offspring quality and quantity in rural (high-risk) and urban (low-risk) households using educational attainment as a proxy for investment in offspring quality. Rural to urban migrant households are suggested to pursue an investment

strategy that falls in between that of rural and urban non-migrants in response to the risk reduction incurred through the act of migration. Parental perceptions of risk and opportunity are presented, and the effect of parental embodied capital on migration and investment decisions is explored.

## **Extrinsic Risk in Fiji**

Fiji is a small South Pacific island nation. The population of Fiji is mainly composed of two ethnic groups, with indigenous Pacific Islander (ethnic Fijians) making up 57% and Indo-Fijians making up 38% (Fiji Islands Bureau of Statistics 2010). Indo-Fijians are mostly descended from South Asian Indians who came to Fiji as indentured sugarcane laborers under British colonial rule between 1879 and 1916. After their period of indenture, most stayed, to work as free sugarcane farmers (Kelly 1991; Lal 2001). Urbanization in Fiji is ongoing, with 51% of the total population and 57% of Indo-Fijians being urban-living. Emigration among Indo-Fijians escalated dramatically during the coup and post-coup periods of 1987 and 2000, creating a self-described “brain drain” among the Indian professional and business classes in Fiji. Now, a pervasive desire to migrate, either internally to a more urban area or internationally to a more developed economy, is expressed by many Indo-Fijians.

The modern Indo-Fijian experience takes place in an array of environments marked by local constraints, including limits on political expression and power, limited land rights, and institutionalized discrimination that limits education and employment options. The desire to migrate may be a response to several aspects of Indo-Fijian life. Limited political expression is seen in the under-representation of Indians at all levels of government. Ethnic Fijian political primacy is enshrined in the constitution, and Indian political progress has generally been met with political coups (1987, 2000, 2006) that reinforce ethnic Fijian political power. Institutional discrimination is prevalent in the education and employment spheres and is difficult to overcome owing to the constitutional provision for affirmative action that benefits ethnic Fijians in education and work (U.S. State Department 2009).

Furthermore, in Fiji more than 90% of the land is inalienably owned by ethnic Fijian kin groups or the government, including most farmland, which is managed through a long-term leasing structure (Kelly 1991; Lal 2001). Land access uncertainty is a major contributor to urban migration among Indo-Fijians, as until recently most rural Indo-Fijians have continued to engage in cash crop sugarcane farming. Since the 2000 coup, cash incentives have been developed that work to encourage reclamation of land by indigenous kin groups, spurring increased lease non-renewal or renewal at much higher prices (Reddy and Naidu 2001). Qualitative data suggest that the rural “push” factor for urban migration stems from decreased rural opportunities outside of agriculture and tenuous land rights that manifest in long-term economic insecurity as families can no longer count on offspring continuing to work the family farm. Migration may represent the response of some parents to the “pull” of an urban environment that may expand opportunities available to offspring. Parents are thus conceptualized as exercising investment strategies contingent on both parental capacities and migration as a risk-reduction strategy.

Two research questions are examined in this paper: How do parental investment strategies correspond to changes in the perceived opportunity structure? and How do parental capacities impact parents' migration and investment decisions in situations of perceived extrinsic risk?

## **Assumptions and Hypotheses**

Parental investment decisions guide the actions parents take regarding the nutrition, education, and labor expenditures of their children. These decisions are shaped by the ecological contexts in which they occur. The theory of embodied capital suggests that parents should be sensitive to variations in ecologically contingent payoffs to learning (Bock 2002; Kaplan et al. 2000, 2002). As such, parents are predicted to be responsive to the cost of continued educational investments past an ecologically contingent point of diminishing returns. The demand for increased skills in urban ecologies increases the payoff to parental investment, effectively increasing the point of saturation. As the average level of investment increases, the production of each additional offspring is more costly, leading to a lower quantity but higher quality of offspring (Becker 1981; Kaplan 1996). In modern environments, the need for formal skills acquisition increases the point of saturation and, consequently, the payoff to parental investment in education. However, extrinsic risk may effectively limit the opportunity structure in some environments, thereby decreasing the point of saturation. When opportunities for returns on investment in education are high, increased quality-based parental investment should result.

Given the rural and urban Indo-Fijian ecologies, three assumptions are made that guide the empirical results presented below. First, the rural environment is assumed to be high risk/low opportunity, and low parental effort should result. The urban environment is assumed to be low risk/high opportunity, and high parental effort should result. Finally, migration is assumed to be a risk-reduction strategy that corresponds to changes in parental effort. These assumptions are evaluated based on qualitative data (see [Results](#)). Given these assumptions, the following four hypotheses are evaluated:

- H1 Parental aspirations will be positively associated with opportunity structure.
- H2 Rural families living in the higher-risk ecology will pursue a more quantity-based parental investment strategy.
- H3 Urban families living in the lower-risk ecology will pursue a more quantity-based parental investment strategy.
- H4 Parental embodied capital is positively associated with (a) migration and (b) a quality-based parental investment strategy.

## **Methods**

### **Sample**

Data presented here were collected from 2004 to 2005 among Indo-Fijian families in two areas of Fiji. Data collection was designed to yield three sample groups: high-

income urban, low-income urban, and rural. The urban study population was in Suva City, the capital of Fiji and by far the most urban area in the country. The rural population was the rural component of the predominantly Indo-Fijian area of Rakiraki, a primarily sugarcane farming community on the north part of the main island of Viti Levu. Randomly chosen cluster sampling was employed, with high-income urban areas over-sampled to ensure adequate numbers of high-income households in the final sample. Urban clusters were enumeration areas, official national census data units. Since geographic delineation of enumeration areas is not available for rural areas of Fiji, clusters of settlements were created by the research team and then randomly chosen for sampling. A large segment of the urban data (85 households) came from large squatter settlements (Raiwaqa and Nanuku) in Suva.

Within each cluster, 100% of Indo-Fijian households with children between 5 and 16 years of age were targeted. Data were collected with approval from the University of Washington's Institutional Review Board (Application No. 03-0236-C02) as well as the Fiji Ministry of Education. Data collection took one to two hours per household and consisted of a quantitative survey, qualitative interview, and standard anthropometric measuring of mothers and children. Data were collected from 232 urban households, a response rate of 89%, and 116 rural households, a response rate of 98%. Data from twelve urban and two rural households have been deemed unusable because they do not contain biological mother-child pairs that fall within the age range of this study, leaving 334 households in the data set. For the analyses presented here, only children six and one-half years of age and older are included, as they will have completed at least 1 year of school. This required eliminating four additional households from analysis. The dataset represents 267 children from 110 rural non-migrant households, 258 children from 142 non-migrant urban households, and 153 children from 78 rural to urban migrant households.

## Quantitative Data Analysis

Descriptive statistics for urban, rural, and migrant group data are presented in Table 1. Quantitative data analysis was done using SPSS 13.0 and Stata 9.5.

**Table 1** Group descriptive characteristics: Mean (SD) or percent

	Urban non-migrant (N=258)	Migrant (N=153)	Rural non-migrant (N 267)
Number of children	2.8 (1.1)	3.0 (1.1)	3.5 (1.3)
Number of children in school	2.2 (0.9)	2.0 (0.7)	2.3 (1.0)
Level of child education			
child	6.6 (4.4)	6.7 (4.2)	7.7 (4.2)
mom	11.2 (3.2)	9.1 (3.7)	8.8 (2.4)
dad	10.7 (4.1)	8.8 (4.4)	8.1 (3.5)
Age of child	11.9 (4.5)	12.7 (5.0)	13.3 (4.8)
Percent female	51.6%	61.4%	50.6%
Years since migrating		8 (6.0)	



Hypothesis 1 was evaluated with chi-square difference testing (SPSS). To evaluate hypotheses 2 and 4a, adjusted and unadjusted comparisons using the general linear model in SPSS were done, and posthoc comparisons are reported. When the homogeneity of variance assumption was met (Sidak's test), pairwise comparisons using Fisher's least significant difference (LSD) tests are reported; otherwise, Games-Howell posthoc comparisons accounting for a lack of homogeneity of variances are reported. Cox Proportional Hazard survival analyses are used to evaluate hypotheses 3 and 4b (extended model). Survival analyses in Stata provide robust standard errors to account for lack of independence arising from multiple children per household. For both analyses, the urban non-migrant condition is the referent category, the event being modeled is leaving school, and the time-dependent variable is years of education completed.

In assessing the proportional hazards assumption, it was concluded that the hazards are proportional through time for urban and rural non-migrants ( $\chi^2=2.70$ ,  $df=1$ ,  $p\leq 0.10$ ); however, the hazard is somewhat non-proportional for migrants (evident graphically in Fig. 3). A goodness-of-fit test relying on Schoenfeld residuals was performed to assess the departure from proportional hazards. Though the hazard of leaving school is significantly non-proportional for migrants relative to non-migrants ( $\chi^2=4.43$ ,  $df=1$ ,  $p\leq 0.04$ ), significance values near 0.05 indicate small deviations from proportionality, and the global test of proportional hazards for migration status is non-significant ( $\chi^2=4.58$ ,  $df=1$ ,  $p\leq 0.10$ ). Given the global test results and the robustness of survival analysis, migration status is included in the full model without being considered time-dependent. When the full range of covariants is considered, parental embodied capital is shown to affect non-proportionality of hazards ( $\chi^2=5.26$ ,  $df=1$ ,  $p\leq 0.03$ ). In addition, the global test of proportional hazard for the full model indicates that the lack of proportionality associated with parental embodied capital affects the model ( $\chi^2=15.54$ ,  $df=1$ ,  $p\leq 0.01$ ) and should be accounted for with a time-dependency interaction term, which is included in the final extended Cox Proportional Hazards model evaluating hypothesis 4b (Kleinbaum 1996).

### Qualitative Data Collection and Analysis

The qualitative portion of data collection consisted of a semi-structured interview on types of employment secured by family members and parental perceptions of opportunities and constraints for their offspring's future employment, which was audiotaped. If urban parents had migrated, additional questions were asked regarding the circumstances of their migration (i.e., motivation to migrate) and transition to the urban ecology (e.g., changes in educational aspirations for offspring). Interviews were audio recorded and transcribed into MSWord by local Indo-Fijian research assistants while data collection was ongoing. Though interviews were anticipated to be conducted with mothers, in about 50% of households, mothers and fathers both participated and generally concurred in their responses. Interviews were conducted during a single household visit and generally lasted about 30 min. Participation was high, with only 5 of 334 households declining to participate in interviews.

Interview questionnaires were structured to elicit information on parental perceptions of opportunities and constraints for offspring's future employment, educational aspirations, past and anticipated migration events, and changes in

migrants' perceptions of quality of life. Given the application of embodied capital theory to the exploration of parental investment and the quality-quantity trade-off in urbanizing environments, the richness provided by semi-structured questions was key to interpreting quantitative data. Interview data were coded for themes relevant to theoretical predictions being investigated, including whether educational performance impacted aspirations, the importance of education in securing employment, and how urbanization impacts short- and long-term payoffs to parental investment. Qualitative data were also used to code specific variables of interest used in quantitative analysis, such as migration status, years since migrating, educational aspirations, future migration aspirations, and employment aspirations.

## Measurement

*Migration Status* For the purposes of analysis, households are considered as migrant status only if they migrated within the context of marriage. Individuals who migrated before marriage are not counted as migrants.

*Parental Embodied Capital* Parental embodied capital is a measure of parental skills and knowledge-based abilities (Kaplan 1996). To capture the qualities of both parents, summed father's plus mother's years of education was chosen as a proxy for parental embodied capital (Neill 2007; Shenk 2004). In order to take into account single parents, this summed value was then divided by two for all two-parent households to create an average value. Twenty-four households have single mothers who are divorced or widowed (10 urban non-migrant, 6 migrant, 8 rural non-migrant). Offspring quantity was determined from survey questionnaire data listing all children born to the mother of the household. Educational attainment is considered as a proxy for offspring quality. Data on current status (enrolled or not enrolled) and years of school completed are available for all household residents.

## Results

### Qualitative Context

Qualitative data strongly suggest that land rights, political problems, and discrimination are elements of extrinsic risk that limit opportunities for Indians in Fiji. Parents express an acute awareness of the escalating diminishing returns to farming and see limited alternatives in the rural area and Fiji in general. Though urban Fiji is generally seen as providing more opportunities than rural Fiji, parents widely consider living "overseas" as a way for children to access an even more expanded opportunity structure. Though not always firmly articulated, the term generally refers to westernized countries outside Fiji, most commonly Australia, New Zealand, Canada, and the United States. The following statements are excerpted from interviews with different women.

Interviewer: Do you want [your child] to do farming as well?

Mother: No. We're done farming and we know how good it is for us and

how bad. There is not enough income. We want our children to move on.

Interviewer: How would the education be different over there [outside of Fiji]?

Mother: There, there are lots of opportunities . . . and choices to make. . . . There are limited choices here [in Fiji].

Interviewer: If [your son] gets a good job . . . where do you want him to live and work?

Mother: Overseas [outside of Fiji]. Because, since the coup, Fiji is no longer that good. The pay is low and there is no future over here.

Interviewer: You want your children to hold their jobs overseas?

Mother: Yes, they will have a better life over there. Here we work the whole day but end up with nothing. Life in overseas will be happy and easy. They won't have to worry about anything.

Educational investment is viewed by most parents as a means to increase access to wages and thereby increase quality of life. Migration is clearly one pathway parents are employing to expand opportunities for offspring. Migrant parents consistently state that the urban area provides greater access for education and employment for both themselves and their children.

Interviewer: Is there any job that you don't want your children to do in the future?

Mother: Like sales girl or those sorts of jobs, you know Fiji is a poor country and no one helps anybody. If you have a good job only then you will have a bright future.

Interviewer: Why did you migrate?

Mother: For employment and education. I came here to complete my degree but we didn't go back. I did teaching here for 2 years and for my upward mobility didn't go back . . . more opportunities are available for all my family members.

Interviewer: After you came from [a large farming town] was there any difference in your thinking regarding your children's education?

Mother: Yes. There, I thought I won't be able to educate my children. After we came here and I saw the opportunities for the student and my view changed.

All migrants were asked about the reasons for migrating to the urban area. Parents indicate that migration is a response to extrinsic risk from land tenure uncertainty. The following are responses from three separate interviews with urban migrants. In all cases, the family's land lease has not been renewed, which is known as having the land "reserved." In each instance, the rural area is characterized as a place that has no opportunity outside the ownership of farmland. Since farmland is reserved, families cease to see investing in new farms or pursuing alternative rural lifestyles as long-term options.

Interviewer: Why did you migrate to Suva?

Mother 1: Because our land got reserved and there is not much income in [Rakiraki].

Mother 2: We only came because there is nothing much left in [Rakiraki].

Mother 3: If our lease hadn't expired, we would have been still there [Rakiraki]. We invested a lot on our property there.

### Parental Aspirations and Perceived Risk

To evaluate hypothesis 1, we asked parents what jobs they envision their children doing as adults. A large number of parents in each group had not yet formed an opinion; this is especially true for parents of young children. The undecided responses are labeled as such. Parental aspirations do seem to be associated with the perceived opportunity structure in each environment ( $\chi^2=95.56$ ,  $df=14$ ,  $p<0.01$ ). Rural non-migrants express a narrower breadth of occupational aspirations than migrant or urban non-migrants. Rural families mainly aspire for their children to become employed as teachers and, for sons, in trades jobs (e.g., mechanic, electrician). These occupations are reported by fewer migrant families and by even fewer urban non-migrant families, who report greater variety in occupational aspirations (Table 2, Fig. 2). Migrants and urban non-migrants more frequently reported aspiring for their children to become doctors, dentists, architects, scientists, lawyers, bankers, and accountants. In all environments, aspirations for children to become architects, pharmacists, journalists, taxi drivers, air hostesses (i.e., flight attendants), and chefs characterized fewer than about 2% of families. Few families in any environment hoped their children would work in farming (0% urban, 1% migrant, <1% rural).

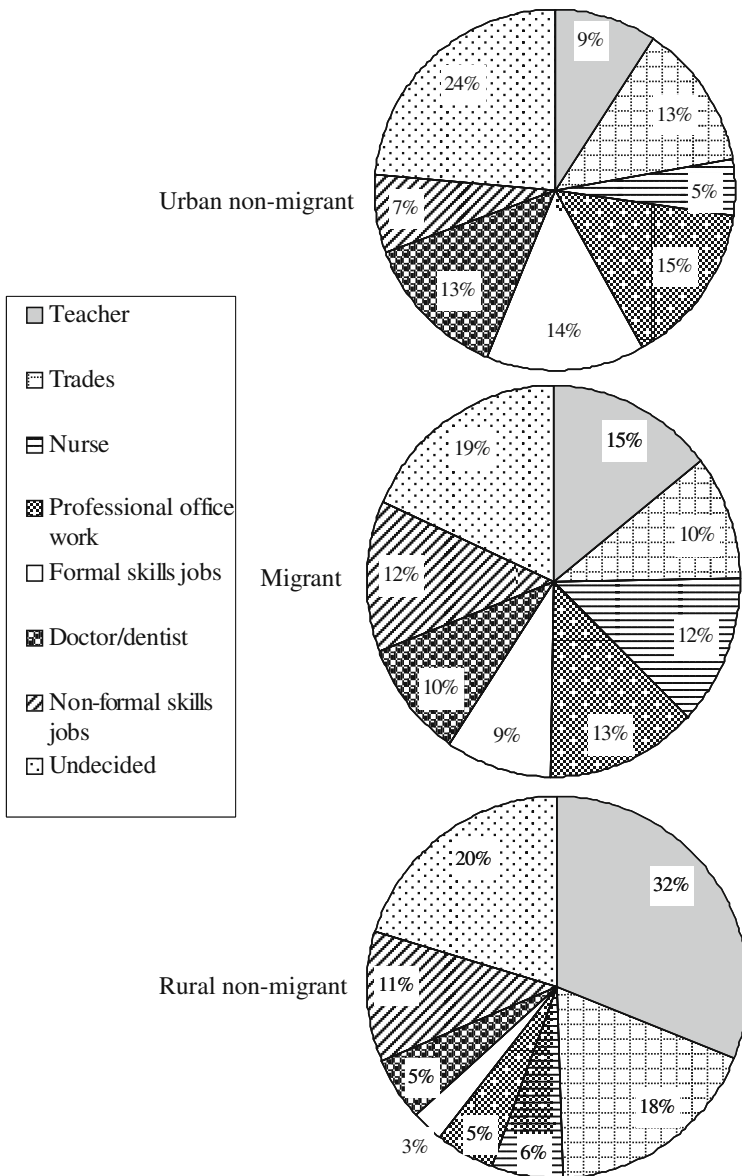
**Table 2** Parents' occupational aspirations for children by migration status. Qualitative data indicate significant differences in occupational attainment aspirations by urban non-migrants ( $N = 258$ ), migrants ( $N = 153$ ), and rural non-migrants ( $N = 267$ ), indicating that parental aspirations do seem to respond to the perceived opportunity structure in each environment ( $\chi^2 = 95.56$ ,  $df = 14$ ,  $p < 0.01$ )

Occupational Aspiration	Migration Status						Total
	Urban non-migrant		Migrant		Rural non-migrant		
	Observed	Expected	Observed	Expected	Observed	Expected	
Teacher	24	49	22	29	83	51	129
Trades	33	37	16	22	49	39	98
Nurse	13	18	19	11	16	19	48
Professional office <sup>a</sup>	38	27	20	16	14	28	72
Formal skills <sup>b</sup>	37	22	14	13	7	23	58
Doctor/dentist	34	24	15	14	14	25	63
Non-formal skills <sup>c</sup>	18	26	19	15	30	26	67
Undecided	61	54	28	32	54	56	143
Total	258		153		267		678

<sup>a</sup> This category includes office professional jobs that were reported at low frequency: accountant, banker, and other professional office positions.

<sup>b</sup> This category includes jobs that were reported at low frequency and require a high level of formal training: architect, pharmacist, scientist, lawyer, and pilot.

<sup>c</sup> This category includes jobs that were reported at a low frequency and require little to no formal training: cashier, garment work, unskilled labor, journalist, police, army, taxi driver, farmer, air hostess, and chef.



**Fig. 2** Occupational aspirations by migration status. Rural non-migrants (*N* 267) express a narrower breadth of aspirations for offspring’s future occupation, with high percentages stating expectations of teaching and trades jobs, relative to urban non-migrants (*N* 258) and migrants (*N* 153)

### Extrinsic Risk and Offspring Quality and Quantity

Hypothesis 2 predicts that a quantity-based parental investment strategy will be more likely in the rural, high-extrinsic-risk ecology than in the lower-risk urban ecology. Rural non-migrant parents have significantly more offspring than urban non-migrant ( $p < 0.01$ ) or migrant ( $p < 0.05$ ) parents ( $F = 10.98, p < 0.01$ ). Migrant parents’

intermediate number of offspring is significantly different from that of urban non-migrant parents ( $p < 0.04$ ) (Table 3).

For hypothesis 3, survival analysis is used to test whether offspring quality is negatively correlated with risk, using parental investment in education as a proxy for quality. The survival analysis models the hazard of leaving school, considering the failure to re-enroll as the event, and completed years of education indicates “survival” time. The urban non-migrant group is the referent category. Age and sex have been included as covariates that might impact the chances of remaining in school. Not surprisingly, given that age varies with years of completed education, age is non-significant and dropped from the model. The coefficient estimates do not change with the removal of age from the model. All analyses are controlled for sex (0=female, 1=male), which is a significant predictor ( $p < 0.01$ ). Males show an increased hazard of leaving school. Results show that the hazard of leaving school is significantly higher for rural non-migrants, who are assumed to be in the high-risk environment (Hazard ratio=2.16,  $p < 0.01$ , Table 4, Fig. 3). Migrants are also significantly more likely to leave school than urban non-migrants, but less so than rural non-migrants (Hazard ratio=1.97,  $p < 0.04$ ).

### The Effect of Embodied Capital on Migration and Parental Investment

Parental embodied capital is highest among urban non-migrant families and lowest among rural non-migrant families ( $F=25.51$ ,  $p < 0.01$ , Table 2). Migrants are intermediate. Migrants have significantly lower levels of embodied capital than urban non-migrants ( $p < 0.01$ ) and marginally significantly higher levels than rural non-migrants ( $p < 0.07$ ). Hypothesis 4 suggests that parental embodied capital is positively associated with (a) migration and (b) a quality-based parental investment strategy. In support of 4a, results suggest that migrants do have a higher level of parental embodied capital than those rural inhabitants who choose not to migrate.

**Table 3** Number of children (age adjusted), number of children (age, parental embodied capital adjusted), and parents embodied capital (averaged years of mother and father). Significant differences ( $p < 0.05$ ) exist in offspring number (age adjusted) by migration status. Urban non-migrants ( $N = 258$ ) have the fewest, rural non-migrants ( $N = 267$ ) the highest, and migrants ( $N = 153$ ) have an intermediate average number of offspring. When parental embodied capital is controlled, urban non-migrants and migrants no longer differ significantly in offspring number ( $p < 0.25$ ). Rural non-migrants maintain a significantly higher number than urban non-migrants ( $p < 0.01$ ) and a marginally significantly lower number than migrants ( $p < 0.08$ ). Parental embodied capital, as measured by averaged years of education, differs significantly between Urban non-migrants and other groups ( $p < 0.01$ ). Rural non-migrants have a marginally significantly lower level than migrants ( $p < 0.06$ )

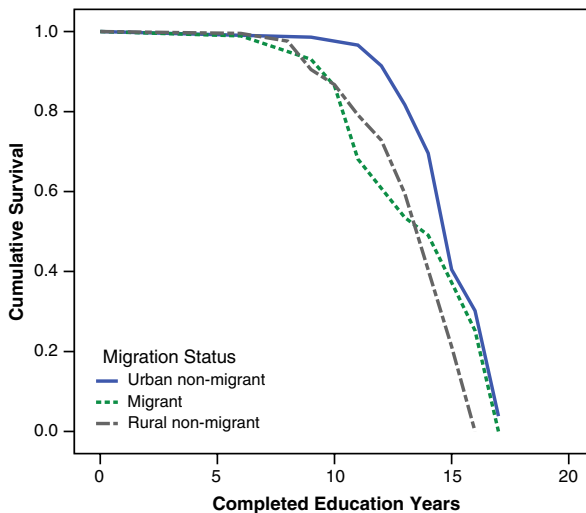
	Urban non-migrant ( $N=142$ hh) (SE, 95%CI)	Migrant ( $N = 78$ hh) (SE, 95%CI)	Rural non-migrant ( $N=110$ hh) (SE, 95%CI)
Number of children	2.4 (0.09, 2.18, 2.53)	2.6 (0.12, 2.39, 2.86)	3.0 (0.06, 2.80, 3.27)
Number of children (parental embodied capital, controlled)	2.4 (0.10, 2.25, 2.63)	2.6 (0.13, 2.35, 2.84)	3.0 (0.11, 2.73, 3.16)
Parents education (average years)	11.4 (0.24, 10.9, 11.8)	9.7 (0.38, 8.9, 10.4)	8.9 (0.22, 8.5, 9.3)

**Table 4** Hazard of leaving school for migrants and rural non-migrants relative to urban non-migrants, adjusted for sex. The hazard of leaving school is significantly higher for rural non-migrants ( $p < 0.00$ ) and migrants ( $p < 0.04$ ) relative to urban non-migrants

Reference	Urban non-migrant	Hazard ratio (Robust SE)	Z	<i>p</i>	95% CI
Migrant		1.97 (0.65)	2.07	0.04	[1.04, 3.75]
Rural non-migrant		2.16 (0.56)	2.98	0.00	[1.30, 3.58]
Sex		2.19 (0.51)	3.35	0.00	[1.39, 3.47]

To evaluate the impact of parental embodied capital on parental investment decisions, hypothesis 4b, quality and quantity were considered while controlling for parental embodied capital. If embodied capital is a factor impacting investment decisions, adjusting for embodied capital will provide a more accurate assessment of the effect of ecological variables at any given level of embodied capital. When the quantity-migration relationship is considered while controlling for parental embodied capital, the differences between urban non-migrants and migrants becomes non-significant ( $p < 0.5$ ). Urban non-migrants maintain significantly fewer ( $p < 0.01$ ) and migrants marginally significantly fewer ( $p < 0.08$ ) offspring than rural non-migrants ( $F = 5.4$ ,  $p < 0.01$ ).

A similar effect of parental embodied capital is seen with the quality (educational investment)–migration relationship. The hazard of leaving school relative to urban non-migrants is decreased for both migrants (Hazard ratio = 1.64,  $p = 0.14$ ) and rural non-migrants (Hazard ratio = 1.80,  $p < 0.04$ ). The difference remains highly significant for rural non-migrants. Migrants, however, no longer have a significantly greater hazard of leaving school than urban non-migrants (Table 5). Thus, at a given level of parental embodied capital, rural parents are putting less effort toward parental investment than



**Fig. 3** Cumulative survival curves for completed years of education by migration status, adjusted for sex (0 female, 1 male). Rural non-migrants ( $N = 267$ ) and migrants ( $N = 153$ ) are significantly more likely to leave school compared to urban non-migrants ( $N = 258$ )

**Table 5** Hazard of leaving school for migrants and rural non-migrants relative to urban non-migrants, adjusted for sex, parental embodied capital, and parental embodied capital through time (interaction). The hazard of leaving school is significantly higher for rural non-migrants ( $N = 267$ ) ( $p < 0.04$ ) relative to urban non-migrants ( $N = 258$ ), but not for migrants ( $N = 153$ ) ( $p = 0.14$ ) when parental embodied capital is controlled

Reference	Urban non-migrant	Hazard ratio (Robust SE)	Z	p	95% CI
Migrant		1.64 (0.55)	1.47	0.14	[0.85,3.15]
Rural non-migrant		1.80 (0.51)	2.08	0.04	[1.03,3.13]
Sex		1.54 (0.39)	1.72	0.09	[0.94,2.52]
Parental embodied capital (averaged education years)		1.88 (0.25)	4.73	0.00	[1.45,2.45]
Parental embodied capital $\times$ completed education years (time-dependent interaction)		0.95 (0.01)	-5.48	0.00	[0.93,0.96]

are urban parents, suggesting that urban versus rural ecology does impact parental investment in quantity and quality and that, within the urban ecology, parental embodied capital exerts a strong effect on parental investment.

## Discussion

Research on the trade-off between offspring quality and quantity is of interest to evolutionary anthropologists and demographers alike. Understanding the ecological factors that impact reproductive and investment decisions is increasingly important as urbanization in developing countries intensifies and fertility begins to decline globally. It is suggested here that living in the urban environment provides incentive to invest in increased child quality because of the increased importance of education in determination of wages. Ecological conditions (i.e., rural, urban, or rural-urban migrant) are shown to affect the construction of parents' aspirations for their offspring. Parental capacities and ecological conditions are shown to impact the strategies employed by parents in helping children achieve human capital. These strategies are identified as migration, which may function to alter the level of opportunity-structure-based risk, and parental investment in education, which is likely to intensify in urban environments.

These results suggest that a reduced opportunity structure in rural environments may be contributing to internal migration in Fiji. Semi-structured qualitative interviews with Indo-Fijian parents suggest that rural parents perceive fewer opportunities for their offspring. The lack of opportunity is reflected in the limited ranges of aspirations for their children's futures relative to urban Indo-Fijians. Though parents state that their perceptions of opportunity structure changed upon exposure to the urban environment, migrant selectivity may play a role in aspiration construction. Migrants have been suggested to be a non-homogenous group compared with rural inhabitants who do not migrate. Thus, migrants may construct different aspirations for their offspring and then act to enhance the payoff to quality-based parental investment through relocating to urban areas, rather than reconceptualizing aspirations following migration. Though these data do not allow for empirical testing of directionality, results do suggest a positive correlation between opportunity



structure, aspirations, and parental investment strategy. Given the relationship between internal migration, land resources, and urbanization globally, understanding the effect of opportunity-based risk and parental investment may prove fruitful ground for urban development policy.

These results offer further empirical support for the suggestion that human capital is an intervening factor in the selectivity of urban migration (Curran 2002). Here, migrants are shown to have higher levels of parental embodied capital than those rural inhabitants who have not migrated. By controlling for embodied capital, the effect of extrinsic factors affecting investment is seen. Results show that, when controlling for parental embodied capital, significant differences exist between urban and rural households in investments in offspring quality and quantity, but the differences between urban non-migrants and migrants becomes non-significant. Thus, at a given level of parental embodied capital, rural parents are putting less effort toward parental investment than are urban non-migrants and migrants. This increased parental effort in urban areas is suggested to be a response to urban parents' perceptions of an expanded opportunity structure that increases the point of saturation of parental effort. Furthermore, the time-dependency associated with parental embodied capital is evidence for the non-proportional payoff to human capital investment in urban ecologies (e.g., Becker 1962).

The quality-quantity trade-off faced by parents in societies with extrasomatic wealth has been investigated in pastoral and agropastoral societies (Bock 2002; Borgerhoff Mulder 2000; Mace 1996) but has not been widely tested in wage-based economies. Kaplan et al. (1995, 2002) found support for an embodied-capital-type quality-quantity trade-off among New Mexican parents when using education as a proxy for quality. High fertility levels are found to be negatively associated with attainment of education and income, highlighting a growing trend for delays in fertility and increases in offspring educational investment. School enrollment has been used to examine the quality-quantity relationship in a national sample of Thai youth (Knodel and Wongsith 1991). Results show a "substantial inverse association" between children's education and offspring number (1991:128), with the overall adjusted probability being twice as great for an only child as for a child from a large family to progress beyond a compulsory education level. Furthermore, the predicted quality-quantity relationship was shown to be robust among both rural and urban households when controlling for wealth. A larger percentage of urban children were educated past the compulsory level, with urban high-income children with few siblings showing the highest level of enrollment.

Offspring quantity and quality are shown to be correlated with opportunity structure, indicating not only that parents perceive ecological limits on investment payoffs, but that they also respond by modifying investment patterns. Rural families are assumed to be living in a low-opportunity environment and they express a quantity-based strategy of investment relative to urban families, who are assumed to be living in a high-opportunity environment. Urban non-migrant families express a quality-based strategy of investment. Rural-to-urban migrants demonstrate a quality-quantity strategy that is intermediate.

In further support of this finding is the significant female bias in educational investment. Indian (Samaiyar 2008) and Indian-descended (Almond and Edlund 2008) populations have shown a persistent son preference even in highly urbanized

areas. The present analysis shows that sons are at a significantly higher hazard of leaving school than are daughters, indicating higher educational investment in daughters than sons. Data also show that, although urban and rural families have about equal numbers of male and female offspring, migrants have far greater numbers of daughters than sons (61% of migrant children are daughters). I interpret this as a result of sex-based opportunity structure. In Fiji, males have a range of employment possibilities, and they can either work as professionals if they are qualified or, if they lack extensive education, in a variety of trades jobs (e.g., mechanic, carpenter). Though there is variation in both status and income, either professional or trades-based employment is a viable path to economic livelihood for males. Females, however, face a much narrower range of culturally acceptable wage-based jobs. Most parents seek for their daughters to achieve skills-based employment in a safe, secure, and respectable job (e.g., nurse, teacher). Because many women in Fiji work very low paying jobs in the garment or sales industries, and because divorce is not uncommon, parents have an incentive to increase the competitiveness of daughters, especially in urban areas, thereby solidifying the long-term economic security of daughters and their future offspring.

Research in urbanizing contexts has failed to consistently demonstrate a family size-educational attainment trade-off. Studies from Asia (Anh et al. 1998; Curran et al. 2004; Knodel and Wongsith 1991; Sudha 1997) demonstrate a negative relationship, indicating that greater numbers of siblings reduce educational attainment. However, studies throughout urbanizing areas of Africa present mixed results (Gomes 1984; Lloyd and Gage-Brandon 1994; Lloyd and Blanc 1996; Montgomery and Kouame 1993). Recent research explaining the regional inconsistencies has focused on “contextual forces that are expected to be influential,” such as the cost of schooling and mechanisms of social support (Eloundou-Enyegue and Williams 2006:27). I suggest that one factor affecting the level of parental investment in education is that of perceived opportunity structure, which is expected to vary ecologically, over time, with parents’ own ability to access opportunities, and with macro-economic and historical factors.

## **Limitations and Future Research**

These analyses have several limitations but also present interesting findings to be explored in future studies. The limitations stem primarily from the lack of complete data on young children and lack of any data on Indo-Fijian overseas migrants. Children who are currently enrolled in school represent “surviving” cases in the analysis. Their final educational attainment will be unknown until such time as they complete or drop out of school. Similarly, parents’ aspirations for children’s future occupational attainment are self-reported speculation. The presence of researchers may have influenced parents’ responses to this open-ended, unverifiable question, or perhaps parents maintain a range of possible occupations for offspring, and their ultimate aspiration has yet to be determined. Though Indo-Fijians have historically demonstrated their ability to succeed in less-than-favorable circumstances, without longitudinal follow-up there is no way of assessing whether parental aspirations are realistic and achievable. Future research might include a longitudinal follow-up to determine the extent to which these aspirations were actually achieved.

Not surveying Indo-Fijian overseas migrants may result in a sample bias underestimating the rural-urban differences in embodied capital and parental investment strategies. Given the issues of migrant selectivity and qualifications inherent in successful overseas emigration, it is likely that the outflow of highly educated Indo-Fijians reduces the strength of relationships explored in these analyses. However, expanded data collection will be necessary to evaluate the variation in urban, migrant, and emigrant individual capacities and parental investment strategies. Finally, it should be acknowledged that educational opportunities themselves are unequal between rural and urban areas. These disparities may result, at least in part, from poorer access to schools in rural areas. Though 72% of primary and 50% of secondary schools are located in rural areas, the rural school density remains low, effectively reducing access and potentially impacting rural school enrollment (Fiji Islands Bureau of Statistics 2010).

**Acknowledgments** This research has been supported by a National Science Foundation Dissertation Improvement Grant (BCS-0413900) and by the Center for Studies in Demography and Ecology and the Department of Anthropology, University of Washington. I wish to thank the Indo-Fijian study participants, without whom this research would not exist. I also wish to thank Deb Schechter, the reviewers, and the editors of *Human Nature* for their helpful comments, and particularly my advisor, Donna Leonetti.

## References

- Anh, T. S., Knodel, J., Lam, D., & Friedman, J. (1998). Family size and children's education in Vietnam. *Demography*, 35, 57-70.
- Almond, D., & Edlund, L. (2008). Son-biased sex ratios in the 2000 United States Census. *Proceedings of the National Academy of Sciences*, 105, 5681-5682.
- Anderson, K. G. (2010). Life expectancy and the timing of life history events in developing countries. *Human Nature*, 21. doi:10.1007/s12110-010-9087-z.
- Becker, G. S. (1962). Investment in Human Capital: a Theoretical Analysis. *Journal of Political Economy*, 70, 9-49.
- Becker, G. S. (1975). *Human Capital* (2nd ed.). New York: Columbia University Press.
- Becker, G. S. (1981). *A Treatise on the Family*. Cambridge, MA: Harvard University Press.
- Becker, G. S., & Tomes, N. (1986). Human Capital and the Rise and Fall of Families. *Journal of Labor Economics*, 4, S1-S39.
- Belsky, J. (2008). War, trauma and children's development: observations from a modern evolutionary perspective. *International Journal of Behavioral Development*, 32, 260-271.
- Belsky, J., Steinberg, L., & Draper, P. (1991). Childhood experience, interpersonal development, and reproductive strategy: an evolutionary theory of socialization. *Child Development*, 62, 647-670.
- Bock, J. (2002). Learning, life history, and productivity: Children's lives in the Okavango Delta, Botswana. *Human Nature*, 13, 161-197.
- Borgerhoff Mulder, M. (1992). Reproductive Decisions. In E. A. Smith & B. Winterhalder (Eds.), *Evolutionary Ecology and Human Behavior* (pp. 339-374). New York: Aldine de Gruyter.
- Borgerhoff Mulder, M. (2000). Optimizing offspring: the quantity-quality tradeoff in agropastoral Kipsigis. *Evolution and Human Behavior*, 21, 391-410.
- Chisholm, J. S. (1999). *Death, hope and sex: Steps to an evolutionary ecology of mind and morality*. New York: Cambridge University Press.
- Costa, D. L., & Kahn, M. E. (2000). Power couples: changes in the locational choice of the college educated, 1940-1990. *Quarterly Journal of Economics*, 115, 1287-1315.
- Curran, S. R. (2002). Migration, social capital, and the environment: considering migrant selectivity and networks in relation to coastal ecosystems. *Population and Development Review*, 28, 89-125S.

- Curran, S. R., Chung, C., Cadge, W., & Varangrat, A. (2004). Boys' and girls' changing educational opportunities in Thailand: the effects of siblings, migration, and village remoteness. *Research in Sociology of Education, 14*, 59–102.
- Draper, P., & Harpending, H. (1982). Father absence and reproductive strategy: an evolutionary perspective. *Journal of Anthropological Research, 38*, 255–273.
- Ellis, B. J., Figueredo, A. J., Brumbach, B. H., & Schlomer, G. L. (2009). Fundamental dimensions of environmental risk: the impact of harsh versus unpredictable environments on the evolution and development of life history strategies. *Human Nature, 20*, 204–268.
- Eloundou-Enyegue, P. M., & Williams, L. B. (2006). Family size and schooling in sub-Saharan African settings: a reexamination. *Demography, 43*, 25–52.
- Fiji Islands Bureau of Statistics. (2010). Fiji National Census of Population 2007. Government of Fiji, Suva. (Accessed 2010 via <http://www.statsfiji.gov.fj/>)
- Geronimus, A. T. (1996). Black/white differences in the relationship of maternal age to birthweight: a population-based test of the weathering hypothesis. *Social Science and Medicine, 42*, 589–597.
- Glaeser, E. L., & Mare, D. C. (2001). Cities and skills. *Journal of Labor Economics, 19*, 316–342.
- Gomes, M. (1984). Family size and educational attainment in Kenya. *Population and Development Review, 10*, 647–660.
- Hill, E. M., Ross, L. T., & Low, B. (1997). The role of future unpredictability in human risk-taking. *Human Nature, 8*, 287–325.
- Huang, T., Orazem, P. F., & Wohlgemuth, D. (2002). Rural population growth, 1950–1990: the roles of human capital, industry structure, and government policy. *American Journal of Agricultural Economics, 84*, 615–627.
- Kanbur, R., & Rapoport, H. (2005). Migration selectivity and the evolution of spatial inequality. *Journal of Economic Geography, 5*, 43–57.
- Kaplan, H. S. (1996). A theory of fertility and parental investment in traditional and modern human societies. *Yearbook of Physical Anthropology, 39*, 91–135.
- Kaplan, H. S., Lancaster, J. B., Bock, J. A., & Johnson, S. E. (1995). Fertility and fitness among Albuquerque men: a competitive labour market theory. In R. I. M. Dunbar (Ed.), *Human Reproductive Decisions: Biological and Social Perspectives*. New York: St. Martin's Press.
- Kaplan, H., Hill, K., Lancaster, J. B., & Hurtado, A. M. (2000). A theory of human life history evolution: diet, intelligence and longevity. *Evolutionary Anthropology, 9*, 156–185.
- Kaplan, H., Lancaster, J. B., Tucker, T. W., & Anderson, K. G. (2002). Evolutionary approach to below replacement fertility. *American Journal of Human Biology, 14*, 233–256.
- Kelly, J. D. (1991). *A Politics of Virtue: Hinduism, Sexuality, and Countercolonial Discourse in Fiji*. Chicago: University of Chicago Press.
- Kleinbaum, D. G. (1996). *Survival analysis: A self-learning text*. New York: Springer.
- Knodel, J., & Wongsith, M. (1991). Family-size and children's education in Thailand—evidence from a national sample. *Demography, 28*, 119–131.
- Lal, B. J. (2001). The East Indians of Fiji. In J. M. Fitzpatrick (Ed.), *Endangered Peoples of Oceania: Struggles to Survive and Thrive*. Westport, CT: Greenwood Press.
- Liang, Z., & Chen, Y. P. (2007). The educational consequences of migration for children in China. *Social Science Research, 36*, 28–47.
- Lloyd, C. B., & Gage-Brandon, A. (1994). High fertility and children's schooling in Ghana: sex differences in parental contributions and educational outcomes. *Population Studies, 48*, 293–306.
- Lloyd, C. B., & Blanc, A. (1996). Child's schooling in sub-Saharan Africa: the role of fathers, mothers, and others. *Population and Development Review, 22*, 265–298.
- Low, B. S. (1988). Measures of Polygyny in Humans. *Current Anthropology, 29*, 189–194.
- Low, B. S., Simon, C. P., & Anderson, K. G. (2002). An evolutionary perspective on demographic transitions: modeling multiple currencies. *American Journal of Human Biology, 14*, 149–167.
- Low, B. S., Hazel, A., Parker, N., & Welch, K. B. (2008). Influences on women's reproductive lives: unexpected ecological underpinnings. *Cross-Cultural Research, 42*, 201–219.
- Lukic, V., & Nikitovic, V. (2004). Refugees from Bosnia and Herzegovina in Serbia: a study of refugee selectivity. *International Migration, 42*, 85–110.
- Mace, R. (1996). When to have another baby: a dynamic model of reproductive decision-making and evidence from Gabbra pastoralists. *Ethology and Sociobiology, 17*, 263–273.
- Montgomery, M., & Kouame, A. (1993). *Fertility and Schooling in Cote d'Ivoire: Is there a tradeoff?* Technical Working Paper 11. Washington, DC: World Bank.
- Moore, M., Gould, P., & Keary, B. S. (2003). Global urbanization and impact on health. *International Journal of Hygiene and Environmental Health, 206*, 269–278.

- Neill, D. B. (2007). Indo-Fijian children's BMI in the context of urbanization, embodied capital, and food choice trade-offs. *Human Nature, 18*, 209–224.
- Pekkala, S. (2003). Migration flows in Finland: regional differences in migration determinants and migrant types. *International Regional Science Review, 26*, 466–482.
- Pennington, R., & Harpending, H. (1988). Fitness and fertility among the khalahari !Kung. *American Journal of Physical Anthropology, 77*, 303–319.
- Quinlan, R. (2006). Human Parental Effort and Environmental Risk. *Proceedings of the Royal Society B, 274*, 121–125.
- Quinlan, R. (2007). Parenting and cultures of risk: a comparative analysis of infidelity, aggression, and witchcraft. *American Anthropologist, 109*, 164–179.
- Quinlan, M. B., & Quinlan, R. J. (2007). Modernization and medicinal plant knowledge in a Caribbean horticultural village. *Medical Anthropology Quarterly, 21*, 169–192.
- Reddy, M., & Naidu, V. (2001). Land tenure system in Fiji: the poverty implications of expiring leases. *Development Bulletin, 55*, 33–35.
- Redman, C. L., & Jones, N. S. (2005). The environmental, social, and health dimensions of urban expansion. *Population and Environment, 26*, 505–520.
- Samaiyar, P. (2008). Intensifying son preference and declining sex ratio in India: a birth order-based analysis. *Indian Journal Of Social Work, 69*, 73–82.
- Sander, W. (2006). Educational attainment and residential location. *Education and Urban Society, 38*, 307–326.
- Shenk, M. K. (2004). Embodied Capital and Heritable Wealth in Complex Cultures: A Class-Based Analysis of Parental Investment in Urban South India. In M. Alvard (Ed.), *Socioeconomic Aspects of Human Behavioral Ecology: Research in Economic Anthropology, 23*, 307–333. Amsterdam: Elsevier.
- Stearns, S. (1992). *The evolution of life histories*. Oxford: Oxford University Press.
- Sudha, S. (1997). Family size, sex composition and children's education: ethnic differentials over development in peninsular Malaysia. *Population Studies: A Journal of Demography, 51*, 139–151.
- United Nations. (2008). *World Urbanization Prospects: The 2007 Revision*. Retrieved from [http://www.un.org/esa/population/publications/wup2007/2007WUP\\_ExecSum\\_web.pdf](http://www.un.org/esa/population/publications/wup2007/2007WUP_ExecSum_web.pdf).
- U.S. State Department. (2009). Fiji. (Accessed 2009 via <http://www.state.gov/p/eap/ci/fj/>)
- VanWey, L. K. (2005). Land ownership as a determinant of international and internal migration in Mexico and internal migration in Thailand. *International Migration Review, 39*, 141–172.
- Wilson, M., & Daly, M. (1997). Life expectancy, economic inequality, homicide, and reproductive timing in Chicago neighborhoods. *British Medical Journal, 314*, 1271–1274.