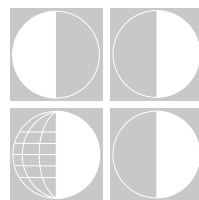


The Marriage Squeeze in Colombia, 1973–2005: The Role of Excess Male Death



James Holland Jones* and Brodie Ferguson

Department of Anthropological Sciences, Stanford University, Stanford

ABSTRACT: Colombia has been characterized by extreme levels of civil violence throughout the latter part of the twentieth century, and the burden of excess mortality attributable to this violence has been borne primarily by young men. Populations with a large violent death burden are likely to experience consequences in terms of (1) marriage markets, (2) the dynamics of family formation and dissolution, and (3) patterns of parental investment in offspring. Using data from national censuses and household surveys, we calculate a measure of the marital sex ratio in order to explore the impact of differential male mortality on marriage markets in Colombia. Overall, Colombia is characterized by a female biased sex ratio at all ages. This relative excess of women is particularly pronounced in certain departments of the Central and Pacific regions which have been especially affected by civil violence. We suggest that the low sex ratios which characterized Colombia are partially responsible for the increasingly high frequency of consensual unions and, potentially, female-biased rural-urban migration.

INTRODUCTION

In a population where marriage is monogamous - whether due to social prescription or ecological circumstances - the relative abundances of men and women can have a strong impact on the dynamics of marriage and family formation. When one sex is in short supply in a marriage market, the other sex is said to be “squeezed.” Demographic factors that change the relative abundances of the sexes, such as sex-specific differential mortality, changing fertility patterns, differential migration, and changing growth rates, can have a profound impact on marriage squeezes. Marriage

squeezes carry a number of social implications, particularly for the wellbeing of women and children.

Differential migration is one phenomenon by which marriage market equilibria may be disturbed. In a number of countries that are net sources of immigrant labor for developed countries like the United States, marriage squeezes can arise in both the source country and in predominantly ethnic receiving communities. In the American labor migration context, this phenomenon has been demonstrated for both Mexico and Vietnam (Goodkind, 1997; Parrado, 2004). In both cases, the donor country experiences a squeeze on women while the immigrant community in the receiving country experiences a squeeze on men, as labor migration to the United States is predominantly male.

Hypergynous marriages - where women marry older and higher-status men - are nearly universal in humans (Dickemann, 1979). Given hypergyny

James Holland Jones and Brodie Ferguson are currently affiliated with the Department of Anthropology at Stanford University.

*Address correspondence to: James Holland Jones, Department of Anthropology, Stanford University, 450 Serra Mall, Bldg. 50, Stanford, CA 94305-2034; Tel: +1-650-723-4824; Fax: +1-650-725-0605. E-mail: jhj1@stanford.edu

and a growing population, later-born cohorts will be larger and so men of appropriate marriage age will be in relatively short supply (Caldwell, Reddy, and Caldwell, 1983). In contrast, in a declining population, men will be squeezed as there will be a relative shortage of younger women as later-born cohorts become progressively smaller. This is precisely the situation facing contemporary China and India today, where precipitous declines in fertility have exacerbated the effects of culturally-driven parental practices such as sex-selective abortion, infanticide, and neglect (Tuljapurkar, Li, and Feldman, 1995). This has produced what amounts to a looming demographic crisis, with adult sex ratios in excess of 1.1 in parts of China and projected to get worse (Tuljapurkar, Li, and Feldman, 1995).

Sex-specific mortality can also have a profound impact on marriage markets. In medieval and early modern Europe, there was a relative lack of women presumably because of a high maternal mortality rate, but also because of the burden of labor on women in peasant agrarian economies (Klasen, 1998). There is some suggestion that this result may be more general. That is, wherever women's agricultural labor burden is high and the returns to labor are relatively modest, women may experience higher mortality and marriage squeezes may ensue. Excess male mortality is more likely to result from war and sectarian violence, which is typically concentrated in younger, lower-status men. However, Plumper and Neumayer (2006) suggest that the total mortality impact of conflict on sex-specific mortality may, in fact, place a larger burden on women.

When women are numerically dominant, women's power in intra-household bargaining and decisions over parental investment are likely to be compromised

(Guttentag and Secord, 1983). Marriage is an economic partnership for the production of children which is maintained by cultural rules and frequently contractual obligations. When there is a relative excess of women, men are not required to enter into a marriage contract in order to have children. Men who father children in consensual unions typically have no legal responsibilities for the mothers or children (Goldman, 1981). In societies where monogamy is socially proscribed, men can nonetheless have children with multiple partners through informal consensual unions, potentially placing both the women and their children at heightened risk for poverty and its attendant negative consequences (Greene and Rao, 1995).

Cready and colleagues (1997) suggest that the serious marriage squeeze on African American women puts them at heightened risk of contracting sexually transmitted diseases. African American women are 7–41 times more likely to be infected with a bacterial STD than white women (Centers for Disease Control and Prevention, 2001). While sexual history surveys indicate that African American women have no more sex partners than white women, they are more than twice as likely as white women to be in a concurrent partnership (Adimora et al., 2002). Concurrent partnerships are known to be a substantial risk factor for contracting STDs (Morris and Kretzschmar, 1995; 1997). One factor thought to contribute to this phenomenon is African American women's lack of bargaining power in negotiating faithful relationships or condom use in an extremely short marriage market. This is consistent with the theory of dyadic power relations as a function of sex ratio given by Guttentag and Secord (1983).

The relationship between the marriage market and violent crime is one of many associations between marital opportunities for women and societal variables including divorce rates, illegitimacy, and domestic violence, each of which can be related to varying levels of paternal investment in marriage and children (Avakame, 1999; Barber, 2003; Guttentag and Secord, 1983). Trent and South (1989) observe that divorce rates are higher in low-sex-ratio societies, which can be interpreted as reduced parental investment in children.

Evidence suggests a direct relationship between violent crime and divorce rates in developed countries (Neapolitan, 1997). For example Barber (2003) investigated the extent to which favorable marriage markets for women are inversely related to historical rates of violent crime in England and Wales, Scotland, and the United States. He found evidence that temporal changes in crime are inversely related to the strength of the marriage market from women's perspective. Since the course of the relationship was instantaneous, he concludes that the results are consistent with a mating competition hypothesis rather than a developmental hypothesis via reduced parental investment.

We predict that the Colombian marriage market will be characterized by a marriage squeeze on women. The ongoing conflict in Colombia has exacted a heavy toll in human life. In keeping with expectations about the distribution of mortality due to warfare, we expect this burden to be felt differentially by men. A potentially competing force for generating a marriage squeeze is differential migration by sex. Labor migration in Latin America shows a distinctly gendered pattern (Massey, Fischer, and Capoferro, 2006; Curran et al., 2006). Rural-urban labor migration is

typically female-biased, as Latin American cities promise jobs in the service sector to young women (Alberts, 1977; Elizaga, 1966; Martínez Gómez, 2001). However, there is an open question with regard to the direction of causality. On the one hand, female-biased migration could create a marriage squeeze on women in destination locations. On the other hand, marriage squeezes in source locations could contribute to the propensity for young women to emigrate. If sex-biased migration is the primary driver for local sex-ratio imbalances and marriage squeezes, then a clear prediction is that marriage squeezes should be absent in rural areas, which are typically sources for women's labor migration.

THE CONTEXT OF VIOLENCE IN COLOMBIA

Colombia has been characterized as one of the most violent countries in the world, and two specific periods of armed violence are often distinguished. The first, known as *La Violencia* (1948–1958), was essentially a civilian confrontation between supporters of the country's two primary political parties. Sánchez and colleagues (Sánchez, Solimano, and Formisano 2002) report that homicide rates in 1946 ranged from as low as 4 per 100,000 inhabitants along the Caribbean Coast to a high of 50 per 100,000 along the border with Venezuela. During *La Violencia*, in contrast, the national homicide rate quadrupled to 40 per 100,000 by 1952, and as many as 180,000 persons lost their lives (United Nations Development Program 2003). Homicides reached a record level of 50 per 100,000 by the end of *La Violencia* in 1958 before declining steadily to approximately 20 per 100,000 by the end of the 1960s. (Sánchez, Solimano, and Formisano, 2002).

In the late 1950s and early 1960s, small armed rural movements linked with

the defense of land rights began evolving into offensive guerrilla movements, although violence remained localized and of low intensity. By the 1980s, however, these strengthened guerrilla groups, the expansion of criminal activity associated with the cocaine trade, and the emergence of illegal paramilitary groups spurred a second cycle of intense homicidal violence in Colombia. The homicide rate climbed steadily to its highest level of 81 per 100,000 in 1992 (Sánchez, Solimano, and Formisano 2002). Negotiation and demobilization efforts throughout the 1990's bore little fruit while massacres and forced migration by armed groups became increasingly common. This more recent period of violence has claimed the lives of almost half a million civilians and combatants in Colombia – over 17,000 per year since 1979. Over three-quarters of these homicides occurred among men, with over one-third of these deaths concentrated among men aged 20 to 29 (Aguirre et al., 2006).

MARRIAGE IN COLOMBIA

Like other countries in Latin America, Colombia is characterized by a relatively high prevalence of marriage. Two key features of the Colombian nuptiality regime must be noted however. First, unions in Colombia dissolve with relatively high frequency. Goldman (1981) estimates that over one-quarter of first marriages in Colombia dissolve within twenty years, and dissolution is especially likely among women who marry at young ages and who reside in urban areas. Second, Colombia has an increasingly high prevalence of consensual unions, climbing from 14% of women ages 20–29 in 1973 to 34% in 1993 (Fussell and Palloni, 2004). Fussell and Palloni (2004) describe three Latin American marriage

regimes: (1) a high-prevalence regime of the richer southern countries, (2) a middle-prevalence regime of the Andean countries, and (3) a low-prevalence regime throughout Central America and the Caribbean. Of the Andean countries, Colombia's frequency of consensual unions has increased most dramatically over the last three decades (Fussell and Palloni, 2004)

Consensual unions may be one strategy for dealing with marriage squeezes, particularly when men are in short supply. Greene and Rao (1995) have argued that the large number of consensual unions in Brazil is a response to a shortage of men among poor communities, particularly in rural areas where men have migrated in search of work. This is similar to the situation with African American women in the United States (Cready, Fossett, and Kiecolt, 1997), where a substantial fraction of young African American men are missing from excess mortality and high rates of incarceration (Western and Pettit, 2000). Consensual unions in Colombia are especially common among women in rural areas, women with little education, and women who have borne children prior to marriage. We therefore consider consensual unions as well as legal marriage in our analysis of marriage patterns since it is precisely such poor, rural women that we expect to bear the greatest burden (demographic and otherwise) of violence in Colombia.

METHODS

DATA SOURCES

Age and sex-specific population data are tabulated by department from censuses carried out by the *Departamento Administrativo Nacional de Estadística* (DANE) in 1973, 1985, 1993, and 2005, as well as intercensal estimates by the

same organization. Age- and sex-specific data on nuptiality and marital status are taken from the same censuses. We augment these census data with information taken from the Colombian Demographic and Health surveys.

We calculate sex ratios of marriage age adults based on the departmental census counts and marriage tabulations from 1973, 1985, 1993, and 2005. Typically, marriage squeeze calculations are derived from data on first marriages. However, the information on marriage available from the Colombian census is simply current status data. Given the fluidity of households in Colombia, we will instead focus on the total number of marriages to adults 15–50 years of age. Marriage data are largely unavailable in the National Censuses for the relatively sparsely populated departments of Guanía, Guaviare, Vaupés, Vichada, and Amazonas. In excess of 90% of the responses to the marital status question are marked as missing in these departments. As a result, we will omit them from most analyses.

MEASURING MARRIAGE SQUEEZE

One measure of the marriage squeeze is the adult sex ratio. However, this calculation, while informative, is less than completely satisfying since it does not incorporate information on age-specific marriage rates. Tuljapurkar and colleagues (1995) present a marital-age sex ratio calculation:

$$R_f = \frac{\sum_x P_x^{(m)} F_x^{(m)}}{\sum_x P_x^{(f)} F_x^{(f)}}, \quad (1)$$

where $P_x^{(i)}$ is the population size of the i th sex age x , and $F_x^{(i)}$ is the frequency of first marriages in sex i at age x . R_f is the ratio of expected marriages of men to

expected marriages to women as both the numerator and denominator represent the expected number of men and women respectively taken over the distribution of marriages.

Jiang et al. (2005) note that R_f has a major weakness as an index. Specifically, while it accounts for expected marriage counts by age, it fails to account for differential age-specific sex ratios. They suggest an altered index:

$$R'_f = \frac{\sum_x P_x^{(m)} SR_x F_x^{(m)}}{\sum_x P_x^{(f)} F_x^{(f)}}, \quad (2)$$

where SR_x is the sex ratio (number of males/number of females) at age x .

The sex ratio calculations of Tuljapurkar, Li and Feldman and Jiang, Li and Feldman both require a density measure of marriages by age. Current status data are regularly used to estimate marriage densities, as in the singulate mean age of marriage calculation (Hajnal, 1953). We estimate the marriage density by age by cumulating the total marriages between ages 15 and 50 for both men and women and normalizing by the total number of marriages in the age range. This measure appears to give a satisfactory estimate of the marriage density as the results are qualitatively very similar to a Coale-McNeil model nuptiality schedule (Coale and McNeil, 1972).

SINGULATE MEAN AGE OF MARRIAGE

We have calculated marital sex ratios without regard to systematic differences in age of entry into marriage or the duration of potential availability in the marriage market. However, hypergyny is a nearly universal feature of human marriage systems. As such, it is important to

measure what age differences, if any, exist in men's and women's entry into marriage. Such differences can have a particularly large impact on the marriage market when the rate of increase of the population is changing, since this change will translate into systematic differences in the size of birth cohorts. We use current status data from the various censuses to calculate the singulate mean age of marriage (SMAM) for men and women (Hajnal, 1953).

RESULTS

Chronic violence has led to a tremendous burden of excess male mortality. Figure 1 plots the natural logarithm of male and female central death rates (${}_nM_x$) against age for two years, 1985 and 2002. The plot reveals an exaggerated accident hump that spans prime adult male ages,

approximately 20–40. Figure 2 plots the ratio of male to female ${}_nM_x$ and shows that the relative risk of male death peaks in the 20–24 year-old age class for both years. In 1985, when mortality rates were higher overall, the peak excess risk for men was 3.52. While overall mortality rates were lower in 2002, the male excess risk increased to a peak of 5.76 in 20–24 year-olds. This increase in the relative risk of mortality for men is partly explicable by a larger decrease in female mortality rates, particularly in the ages 20–40 and partly explicable by a substantial increase in men's mortality in age 15–19. By 2002, violence in Colombia had abated somewhat from its maximum in the early nineties, but it was still worse than it was in 1985.

We summarize the marital sex ratio calculations using maps. Figure 3a–d. present the marital sex ratios for 1973,

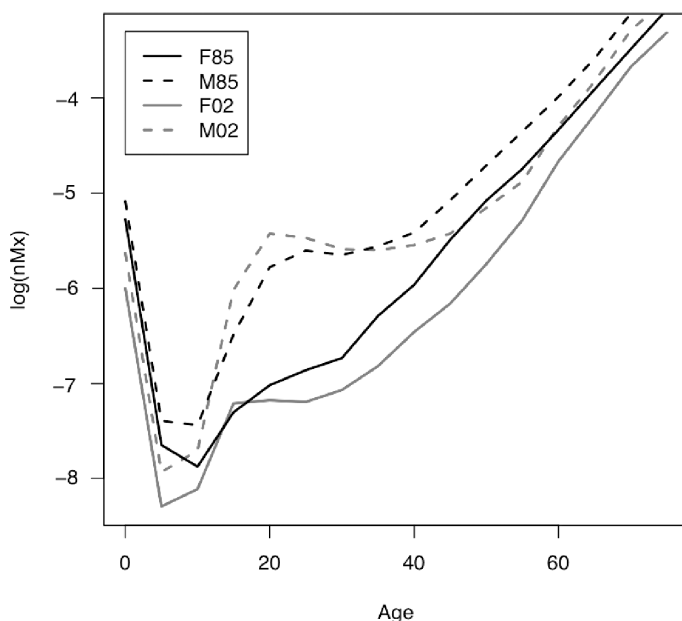


FIG. 1.—Natural Logarithms of male and female central mortality rates in 1985 and 2002.

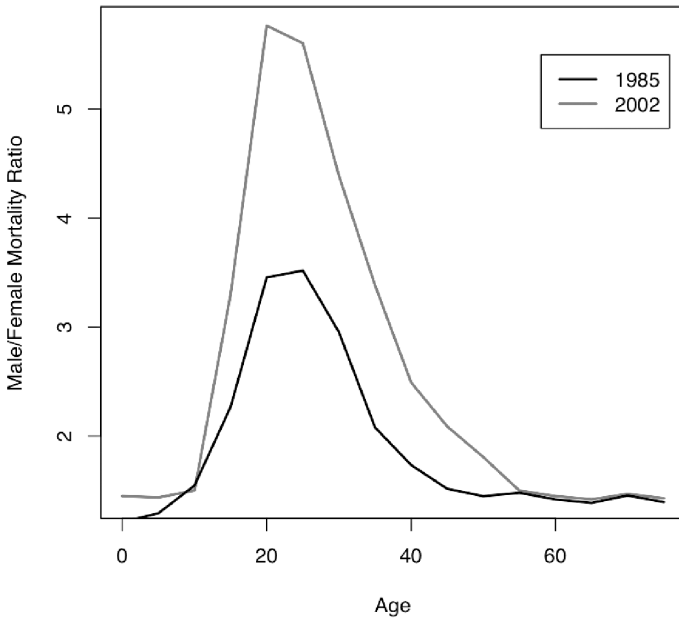


FIG. 2.—Ratio of male-to-female mortality in 1985 and 2002. The ratio of male-to-female mortality increased in 2002 despite the fact that mortality overall decreased.

1985, 1993, and 2005. There is clearly a gradient in which very low marital sex ratios run through the Andean center of the country down to the Pacific coast. Strongly male-biased marital sex ratios are observed in both the Atlantic and Amazonian lowland regions for which sufficient data exist.

The great majority of departments in all census years show values of $R_f' < 1$, indicating a general squeeze on women. A ratio of $R_f' < 1$ indicates that there is a relative shortage of men and this finding is consistent with the aggregate national mortality statistics, showing strongly elevated mortality of men during prime adult years. The minimum value was $R_f' = 0.62$ for Chocó in 1973. It is worth noting here that Chocó is essentially a rural department, containing no major cities to draw female labor migrants. This is a truly stunning number as it means that for

every 100 men entering marriage in Chocó in 1973, there would have been 160 women.

The two most likely explanations for the generally low marital sex ratios are sex-specific differential mortality or sex-specific differential migration. Both migration and mortality rates vary by department and this variation allows us to test the effects of migration and mortality on the marital sex ratio across departments. Using sex-specific migration data tabulated by Gómez (2001), we tested the hypothesis that departmental sex ratios are driven by either differential migration or mortality by regressing the observed marital sex ratio in 1993 against the ratio of male-to-female migration rates from 1989–1993 and an index of mortality, either male or female life expectancy or their difference (they are strongly correlated $r = 0.92$, $CI = (0.82, 0.96)$, $t = 11.3$,

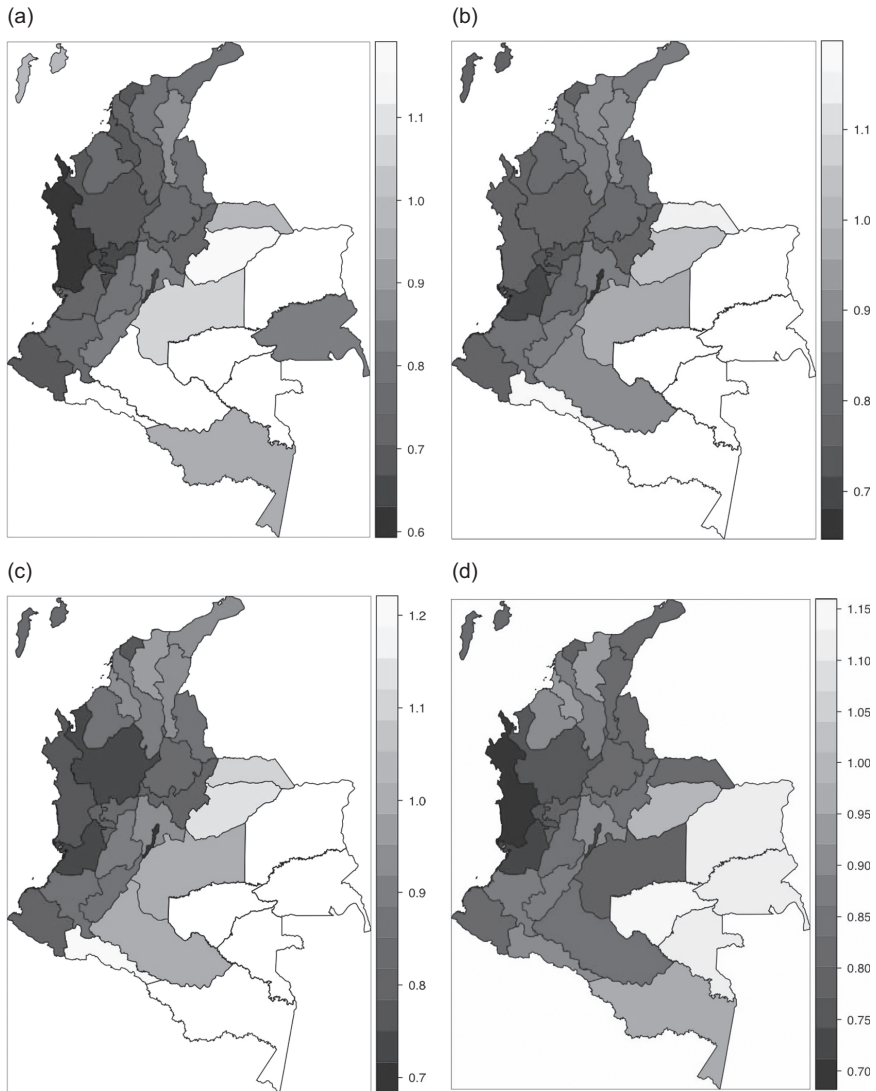


FIG. 3.—Map of the marital sex ratio, R_f' , by department from the (a) 1973, (b) 1985, (c) 1993, and (d) 2005 national census. White departments indicate missing values.

$df = 25, p < 0.0001$). The mortality index was highly predictive of the marital sex ratio (all of them give qualitatively identical results) but the sex-specific migration ratio is not significant. Table 1 summarizes this regression. These results strongly suggest that it is excess male mortality

that is primarily driving the observed low marital sex ratios.

The mean difference in SMAM between men and women across departments was 4.5 years in 1973 and 1985, 3.4 years in 1993, and 3.3 years in 2005. SMAM varies by department. Figure 4

TABLE 1
RESULTS OF THE REGRESSIONS OF DEPARTMENTAL
MARITAL SEX RATIO ON MALE LIFE EXPECTANCY
AT BIRTH AND THE SEX-SPECIFIC MIGRATION RATIO

VARIABLE	ESTIMATE	STD. ERROR	T VALUE	P-VALUE
(Intercept)	-0.161	0.484	-0.333	0.742
Male e_0	0.015	0.005	2.975	0.007
migration sex ratio	6.257E-05	0.002	0.030	0.977

Adjusted $R^2 = 0.2807$, $F = 6.072$, $df = (2,24)$ $p < 0.01$.

plots male SMAM as a function of female SMAM for the four census years. Ordinary least-squares regression of male onto female SMAM shows that female SMAM is highly predictive of male SMAM in three out of the four censuses, with 1985

being the unusual year. Table 2 presents the results of the regressions.

The implications of these age differences are two-fold. On the one hand, later ages of marriage for men means that the greater competing forces of mortality acting on them reduce the size of marrigable cohorts to a greater extent. On the other hand, because the rate of increase in Colombia is declining, this effect will be somewhat mitigated.

DISCUSSION

Based on our examination of patterns of adult mortality in Colombia, we predicted that marital-age sex ratios in Colombia would be strongly female-biased as many eligible men have left the at-risk population

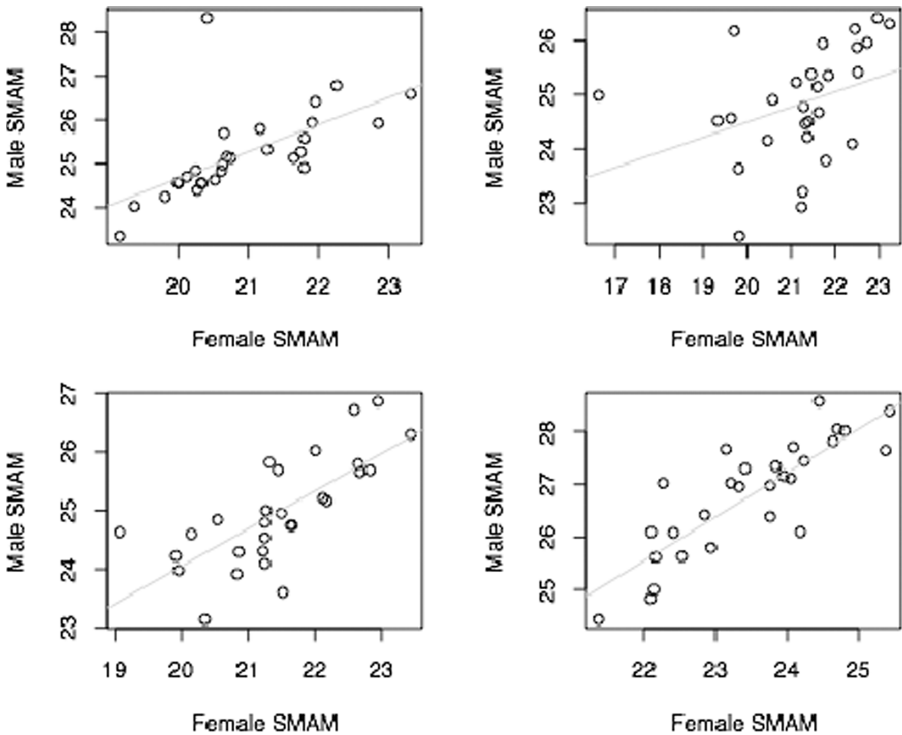


FIG. 4.— Relationship between mean age of marriage of men and women (both measured by the singulate mean age of marriage) across departments for 1973, 1985, (top panels) and 1993, 2005 (bottom panels).

TABLE 2
RESULTS OF REGRESSIONS OF MALE SMAM
ON FEMALE SMAM

YEAR	INTERCEPT	SLOPE	OVERALL MODEL p	R^2
1973	12.31***	0.62***	< 0.001	0.396
1985	18.92***	0.28°	0.055	0.135
1993	11.19***	0.64***	< 0.001	0.523
2005	7.2***	0.83***	< 0.001	0.761

*** $p < 0.001$, ° $0.1 > p > 0.05$.

for marriage because of premature death. Presumably, the driving force behind this excess male mortality is violence.¹ Consistent with our expectations, most departments in Colombia show strongly female-biased marital sex ratios using data from the last four national censuses. Sex ratios are particularly low in the Andean and Pacific coastal departments, where violence secondary to the illicit drug trade is particularly severe. Multiple regression of marital sex ratio on an index of mortality and the sex-ratio of departmental out-migration indicates that mortality, but not the sex-ratio of migration is predictive of marital sex ratio, suggesting that differential mortality is likely to be the primary driver for the marriage squeeze on women.

The extent of sex ratio imbalances begs the question of how women adapt to such a marriage market. Fields (1979) suggested that women are more responsive than are men to economic opportunities associated with migration for sociological reasons. That is, the economic opportunity associated with migration to which women respond is mediated by some sociological variable. We hypothesize that sex-ratio imbalances may be such a mediating sociological variable in Colombia. Poor rural women with poor family-formation prospects move to the cities to work in the service sector as domestics and in low-skill labor sectors such as the cut-flower industry.

The sex ratios throughout the Andean region and the Pacific-coast departments are remarkably low, and have remained so for over 30 years. However, there is a suggestion that the marriage squeeze has abated somewhat from the 1993 to the 2005 census. The values of R_f' aggregated across departments for the four censuses were 0.79, 0.85, 0.89, and 0.94.² This last value from 2005, while nearing unity, nonetheless hides a great deal of spatial heterogeneity as indicated by figure 3d. There are still departments with highly uneven sex ratios.

We expect sex ratios to have large impacts on society. One area of particular interest is the impact of sex ratios on women's wellbeing and empowerment. In general, we expect highly unbalanced marital sex ratios to be bad for women's wellbeing. In particular, we hypothesize two general patterns for women's wellbeing that arise from unbalanced marriage markets. When women are squeezed, as is the case in Colombia, women's bargaining power within households is likely to be compromised, and male partners are more likely to have extra-partnership sexual relations. This was the expectation of Greene and Rao (1995) in Brazil which was largely borne out by their data. When men are squeezed, as is the case in contemporary China and India, we predict that violence against women will be more common and will typically be perpetrated by men outside of the woman's home, by poor, disenfranchised men. The scarcity of women of marriageable age results in increased mating competition and male-male aggression, evidenced by higher levels of violence and crime. Hudson and den Boer (2004) argue that such men, traditionally referred to as "bare branches" in Chinese culture, represent a substantial threat to both domestic and international security.

Clearly, the consequences of low sex ratios are more relevant for Colombia. South and Messner (1987) find that women's property crimes are higher in low-sex-ratio societies, a phenomenon that they interpret as the result of diminished economic investment from men. The issue of men's economic investment in women and their children is of central importance in thinking about the societal implications of highly unbalanced sex ratios. Greene and Rao (1995) note four likely responses to low sex ratios: (1) women may marry younger men, (2) more women may remain unmarried, (3) men may marry multiple women, and (4) men may maintain multiple informal relationships. Informal marriage is a response that deserves further investigation in the Colombian case. Colombia is characterized by very high frequencies of consensual union at most adult ages. Informal marriage has repeatedly been found to be associated with reductions in women's bargaining power and economic status (Castro Martin, 2002; Glaser, 1999; Greene and

Rao, 1995; Grossbard-Schnechtman 1982). Understanding the inter-related processes of sex-specific excess mortality, marriage squeezes, and the dynamics of informal marriage is a research priority for the social demography of Colombia.

Fortunately, violence in Colombia has abated somewhat since its peak in the 1990s and cities such as Bogotá, Cali, and Medellín have made dramatic progress in reducing violent crime in recent years (Aguirre et al., 2006). Nonetheless, the social consequences of past violence and continuing violence in rural areas will continue to pose challenges for Colombian development and the wellbeing of Colombia's people.

ACKNOWLEDGMENTS

We thank Claudia Engel for assistance with spatial analysis and graphics in R. Jorge Restrepo and Grant Miller provided critical feedback and help with data sources. This work was supported by grant K01HD051494 to JHJ from NICHD.

NOTES

1. In a forthcoming paper, we measure the impact of gun-related violence on male and female mortality.

2. The 2005 census allowed us to calculate values of R_f' for the low population density Amazonian departments, which all have values of R_f' greater than unity. Excluding these from the mean calculation, the aggregated value of R_f' in 2005 is still 0.92.

REFERENCES

- ADIMORA, A. A., V. J. SCHOENBACH, D. M. BONAS, F. E. A. MARTINSON, K. H. DONALDSON, and T. R. STANCIL, 2002. Concurrent sexual partnerships among women in the United States. *Epidemiology* **13**(3):320–327.
- AGUIRRE KATHERINE, ROBERT MUGGAH, JORGE ALBERTO RESTREPO, and MICHAEL SPAGAT, 2006. Colombia's Hydra: The Many Faces of Gun Violence. In *The Small Arms Survey 2006: Unfinished Business*, edited by S. A. Survey. Oxford: Oxford University Press.
- ALBERTS, J., 1977. Migración hacia Áreas Metropolitanas de América Latina: Un Estudio Comparativo. Santiago de Chile: Centro Latinoamericano de Demografía.
- AVAKAME, EDEM F. 1999. Sex Ratios, Female Labor Force Participation, and Lethal Violence Against Women: Extending Guttentag and Secord's Thesis. *Violence Against Women* **5**(11):1321–1341.
- BARBER, N. 2003. The sex ratio and female marital opportunity as historical predictors of violent crime in England, Scotland, and the United States. *Cross-Cultural Research* **37**(4):373–392.
- CALDWELL, J. C., P. H. REDDY, and P. CALDWELL, 1983. The causes of marriage change in South India. *Population Studies* **37**(3):343–361.

- CASTRO MARTIN, T. 2002. Consensual unions in Latin America: Persistence of a dual nuptiality system. *Journal of Comparative Family Studies* 33(1):35-55.
- CENTERS FOR DISEASE CONTROL AND PREVENTION, 2001. Sexually Transmitted Disease Surveillance, 2000. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention.
- COALE, A. J. and D. R. McNEIL, 1972. The distribution by age of the frequency of first marriage in a female cohort. *Journal of the American Statistical Association* 67(340):743-749.
- CREADY, C. M., M. A. FOSSETT, and K. J. KIECOLT, 1997. Mate availability and African American family structure in the US nonmetropolitan south, 1960-1990. *Journal of Marriage and the Family* 59(1):192-203.
- CURRAN, S. R., S. SHAFER, K. M. DONATO, and F. GARIP, 2006. Mapping gender and migration in sociological scholarship: Is it segregation or integration? *International Migration Review* 40(1):199-223.
- DICKEMANN, M. 1979. The ecology of mating systems in hypergynous dowry societies. *Social Science Information* 18:163-195.
- ELIZAGA, J. C. 1966. A study of migration to greater Santiago (Chile). *Demography* 3(2):352-377.
- FIELDS, G. S. 1979. Lifetime migration in Colombia: Tests of the expected income hypothesis. *Population and Development Review* 5(2):247-265.
- FUSSELL, E. and A. PALLONI, 2004. Persistent marriage regimes in changing times. *Journal of Marriage and the Family* 66(5):1201-1213.
- GLASER, K. 1999. Consensual unions in two Costa Rican communities: An analysis using focus groups methodology. *Journal of Comparative Family Studies* 30(1):57-77.
- GOLDMAN, NOREEN, 1981. Dissolution of first unions in Colombia, Panama, and Peru. *Demography* 18(4):659-679.
- GOODKIND, D. 1997. The Vietnamese double marriage squeeze. *International Migration Review* 31(1):108-127.
- GREENE, M. E. and V. RAO, 1995. The Marriage Squeeze and the Rise in Informal Marriage in Brazil. *Social Biology* 42(1-2):65-82.
- GROSSBARD-SCHNECHTMAN, S. A. 1982. A theory of marriage formality: The case of Guatemala. *Economic Development and Cultural Change* 30:813-830.
- GUTTAG, MARCIA and PAUL F. SECORD, 1983. Too Many Women? The Sex Ratio Question. Beverly Hills, CA: Sage Publications.
- HAJNAL, J. 1953. Age at marriage and the proportion marrying. *Population Studies* 7(2):111-136.
- HUDSON, M. VALERIE, and ANDREA M. DEN BOER, 2004. Bare Branches: The Security Implications of Asia's Surplus Male Population. Cambridge, MA: The MIT Press.
- JIANG, Q., S. Z. LI, and M. W. FELDMAN, 2005. China's son preference and measurement of marriage squeeze: The integrated analysis of first marriage and remarriage market. In CEPED-CICRED-INED Seminar on the Female Deficit in Asia: Trends and Perspectives. Singapore.
- KLASEN, S. 1998. Marriage, bargaining, and intra-household resource allocation: Excess female mortality among adults during early German development, 1740-1860. *Journal of Economic History* 58(2):432-467.
- MARTÍNEZ GÓMEZ, C. 2001. Las Migraciones Internas en Colombia Análisis Territorial y Demográfico Según los Censos de 1973 y 1993. Departamento de Geografía - Centro de Estudios Demográficos, Universidad Autónoma de Barcelona, Barcelona.
- MASSEY, D. S., M. J. FISCHER, and C. CAPOFERRO, 2006. International migration and gender in Latin America: A comparative analysis. *International Migration* 44(5):63-91.
- MORRIS, M. and M. KRETZSCHMAR, 1995. Concurrent partnerships and transmission dynamics in networks. *Social Networks* 17(3-4):299-318.
- , 1997. Concurrent partnerships and the spread of HIV. *AIDS* 11(5):641-648.
- NEAPOLITAN, L. JEROME, 1997. Cross-National Crime: A Research Review and Sourcebook. Westport, CT: Greenwood.
- PARRADO, E. A. 2004. International migration and men's marriage in Western Mexico. *Journal of Comparative Family Studies* 35(1):51-72.
- PLUMPER, T. and E. NEUMAYER, 2006. The unequal burden of war: The effect of armed conflict on the gender gap in life expectancy. *International Organization* 60(3):723-754.
- SÁNCHEZ FABIO, ANDRÉS SOLIMANO, and MICHEL FORMISANO, 2002. Conflict, Violent Crime and Criminal Activity in Colombia. New Haven: Research Program of The Economics and Politics of Civil Wars, Yale University.
- SOUTH, J. SCOTT and STEVEN F. MESSNER, 1987. The sex ratio and women's involvement in crime: a cross-national analysis. *The Sociological Quarterly* 28(2):171-188.
- TOFT, C. A. and P. J. SHEA, 1983. Detecting community-wide patterns: Estimating power strengthens statistical inference. *Am. Nat.* 122:618-625.
- TRENT, K. and S. J. SOUTH, 1989. Structural Determinants of the Divorce Rate - a Cross-Societal Analysis. *Journal of Marriage and the Family* 51(2):391-404.
- TULJAPURKAR, S., N. LI, and M. W. FELDMAN, 1995. High sex ratios in China's future. *Science* 267:874-876.
- United Nations Development Program. 2003. The Conflict, A Way Out: National Report on Human Development for Colombia - 2003. Bogota: United Nations Development Program - Colombia.
- WESTERN, B. and B. PETTIT, 2000. Incarceration and racial inequality in men's employment. *Industrial & Labor Relations Review* 54(1):3-16.