Chapter 1

The Gender Dimension of Environmental and Human Security

Biologists, sociologists, and anthropologists have long assumed that scarcity, whether natural or man-made, is the chief catalyst for both social competition and social conflict. Scarcity may involve tangible items of value, such as cattle or water, or less tangible goods, such as societal status or group identification.

For decades, most international relations research paid little attention to scarcity or the sociobiological roots of competition and conflict, focusing instead on such issues as the ideological differences underpinning the Cold War. The end of the Cold War brought with it a corrective to this perspective: In the absence of great power conflict, scholars have begun to consider more fully the role of scarcity and inequality in producing both domestic and international conflict. This is the research agenda of the relatively new subfield of security studies called environmental security.

A second emerging subfield of security studies, known as human security, calls for a more integrated understanding of how the security of individuals is related to the security of nations.[1] In this approach, security is built from the ground up and from the inside out, individual by individual, family by family, group by group, community by community. National security is derived from the aggregation of these micro levels of security, in addition to standard assessments of external threat. Security thus has two referents—the state and the individual—and what happens

1. For an overview of the literature of this subfield, see Andrew Mack, "The Security Report Project Background Paper," Human Security Centre, University of British Columbia, Vancouver, Canada, 2003, http://www.humansecuritybulletin.info/archive/en_v1i2.

at one level profoundly influences what happens at the other. While we intuitively understand how national security can affect individual security, scholars are only now beginning to research how individual security can affect national security. Furthermore, it is intriguing to see the linkages possible between the subfields of environmental security and human security. Issues of scarcity and inequality operate first and foremost, it can be argued, at the subnational levels of interest to human security scholars.

We can begin to see these linkages in the more developed literature of the environmental security subfield. International relations experts are increasingly turning their attention to factors such as nationalism, identity, and migration to explain strife in the post–Cold War world. Writing in 1994, a founder of the environmental security subfield, Thomas Homer-Dixon, declared, "Environmental scarcities are already contributing to violent conflicts in many parts of the developing world. These conflicts are probably the early signs of an upsurge of violence in the coming decades that will be induced or aggravated by scarcity."[2] Some scholars, including Homer-Dixon, predict that this upsurge in violence will lead not only to civil strife but also to international conflict. Another important linkage in environmental security analysis is between scarcity and environmental stress, on the one hand, and large population movements across state borders, on the other, which can produce conflict involving group identity. Since the early 1990s, scholars in the environmental security subfield have documented a growing number of cases of civil and international conflicts arising from these dynamics.[3] Recent efforts by scholars in other fields have buttressed their work.[4] The environmental security subfield

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2. Thomas F. Homer-Dixon, "Environmental Scarcities and Violent Conflict: Evidence from Cases," *International Security,* Vol. 19, No. 1 (Summer 1994), p. 5.

3. See, for example, Astri Suhrke, "Pressure Points: Environmental Degradation, Migration, and Conflict," Occasional Paper No. 3 (Toronto: Project on Environmental Change and Acute Conflict, University of Toronto and the American Academy of Arts and Sciences, March 1993); Alex de Sherbinin, "World Population Growth and U.S. National Security," *Environmental Change and Security Project Report,* No. 1 (Spring 1995), pp. 24–39; Sanjoy Hazarika, "Bangladesh and Assam: Land Pressures, Migration, and Ethnic Conflict," Occasional Paper No. 3 (Toronto: Project on Environmental Change and Acute Conflict, University of Toronto and the American Academy of Arts and Sciences, March 1993); Thomas F. Homer-Dixon, *Environmental Scarcity and Global Security* (New York: Foreign Policy Association, 1993); and Jeffrey Boutwell and Thomas F. Homer-Dixon, "Environmental Change, Global Security, and U.S. Policy," in Charles F. Hermann, ed., *American Defense Annual* (New York: Lexington, 1994), pp. 201–224.

4. See, for example, Mark Levy, "Global Environmental Degradation: National Security and U.S. Foreign Policy," Working Paper No. 9 (Cambridge, Mass.: Project on the

has even gained some acceptance within the international security community.[5]

Our research is located at the nexus between environmental security and human security. In this book, we argue that both scarcity of resources and unequal access to those resources are the most important sources of conflict at any level of analysis. However, unlike most studies that focus on such common catalysts of environmental security as ozone depletion or deforestation, our study seeks to explain the influence of a factor more associated with the human security agenda that thus far environmental security scholars have overlooked as a source of scarcity and unequal resource access: namely, exaggerated gender inequality. The hallmark of exaggerated gender inequality is the use of violence against females because of their gender. Environmental security (and indeed security studies more generally) is impoverished as an intellectual construct to the extent that it fails to explore the relationship between violence against women and violence within and between societies. This study serves to demonstrate the greater conceptual potential to be found at the intersection of the environmental and human security approaches.

There is probably no society in the world in which females do not ex-

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Changing Security Environment and American National Interests, John M. Olin Institute for Strategic Studies, Harvard University, November 1994); Joan M. Nelson, "Migrants, Urban Poverty, and Instability in Developing Nations," Occasional Papers in International Affairs No. 22 (Cambridge, Mass.: Center for International Affairs, Harvard University, September 1969); A.S. Oberai, *Population Growth, Employment, and Poverty in Third World Mega-Cities* (New York: St. Martin's, 1993); John Walton and David Seddon, *Free Markets and Food Riots: The Politics of Global Adjustment* (Cambridge, Mass.: Blackwell, 1994); Hans-Georg Bohle, Thomas E. Downing, and Michael J. Watts, "Climate Change and Social Vulnerability: Towards a Sociology and Geography of Food Security," *Global Environmental Change,* Vol. 4, No. 1 (March 1994), pp. 37–48; Mark Duffield, "The Political Economy of Internal War: Asset Transfer, Complex Emergencies, and International Aid," in Joanna Macrae and Anthony Zwi, eds., *War and Hunger: Rethinking International Responses to Complex Emergencies* (London: Zed, 1994), pp. 50–69; Peter H. Gleick, "Water and Conflict: Fresh Water Resources and International Security," *International Security,* Vol. 18, No. 1 (Summer 1993), pp. 79–112; Ted Robert Gurr, "On the Political Consequences of Scarcity and Economic Decline," *International Studies Quarterly,* Vol. 29, No. 1 (March 1985), pp. 51–75; Shaukat Hassan, *Environmental Issues and Security in South Asia,* Adelphi Papers No. 262 (London: Brassey's, 1991); Robert D. Kaplan, "The Coming Anarchy," *Atlantic Monthly,* Vol. 272, No. 2 (February 1994), pp. 44–81; Michael Renner, *National Security: The Economic and Environmental Dimensions,* Worldwatch Paper No. 89 (Washington, D.C.: Worldwatch Institute, 1989); and Arthur H. Westing, ed., *Global Resources and International Conflict: Environmental Factors in Strategic Policy and Action* (Oxford: Oxford University Press, 1986).

5. Steven Greenhouse, "The Greening of U.S. Diplomacy," *New York Times,* October 9, 1995, p. A6.

perience some form of gender inequality—that is, the subordinate status or inferior treatment of females in political, legal, social, or economic matters. Gender inequality exists when females, compared with their male counterparts, are less educated and less well nourished; receive less medical care; cannot make important life decisions; and have fewer political, legal, social, and economic rights and freedoms. Not all societies, however, practice *exaggerated* gender inequality, the subject of this study. For this study, we define exaggerated gender inequality as existing when, because of gender, one infant is allowed to live while another is actively or passively killed. Offspring sex selection, which almost universally favors males, is found in societies where the lives of females hold significantly less value than those of males, or, indeed, when they have no value at all.[6] Offspring sex selection denotes violence against females simply because they are female. There can be no greater evidence of exaggerated gender inequality in a society than prevalent offspring sex selection.

If violence against females within a society bears any relationship to violence within and between societies, then it should be possible to observe this relationship at work in societies where violence against women is exaggerated—that is, in countries where offspring sex selection is prevalent, such as China and India. As the two largest societies in the world, China and India comprise more than 38 percent of the world's population. Because of the socially sanctioned practice of offspring sex selection, both societies have surpluses of young adult males (ages 15–34) larger than any that natural forces could produce. The Chinese have even coined a term for these young males: "bare branches." The imbalance between the numbers of young males and young females in contemporary China and India is arguably larger than in any other historical period.

The masculinization of Asia's sex ratios is one of the overlooked "megatrends" of our time, a phenomenon that may very likely influence the course of national and perhaps even international politics in the twenty-first century. The scale on which sex ratios are being artificially altered in China and India, as well as in Asia more generally, is unprecedented. The time has come for academics and national security policymakers to consider the potential consequences of the vast demographic shift brought on by Asia's spiraling sex ratios. The security logic of high-sex-ratio societies, we argue, differs tremendously from that of nations with normal sex ratios. Indeed gender issues, so long ignored in the

6. "Offspring sex selection" should not be confused with "sex selection" as used by evolutionary biologists. Offspring sex selection refers to the selective rearing of children based on sex. Female infanticide and sex-selective abortion are two examples of offspring sex selection.

study of national security, could become a central focus of security scholars as this century continues to unfold.

In this chapter, we explain the methodological and theoretical approach of our research project. We then synthesize the literature on the origins of offspring sex selection among humans. Following this we explore the persistence of the practice long after the initial catalysts have subsided, noting in particular the role of religion and the imperatives of hypergynous social structures.

Methodological Considerations

For our study, we have adopted Homer-Dixon's approach of confirmatory process tracing.[7] According to Homer-Dixon, in highly complex systems that incorporate both social and physical variables, a confirmatory approach is preferable to a falsificationist approach when a variable is first identified for study. Only a confirmatory approach allows the researcher to include a variable that may not be necessary or sufficient by itself, but that is part of a set of sufficient conditions for a given phenomenon. Such a variable may amplify, aggravate, or trigger the phenomenon through interaction with other variables in the set.

This approach may not satisfy those who would prefer instead a bottom-line statistical analysis that would yield, for example, a statistical correlation between sex ratio at birth and some indicator of civil or international strife.[8] Because we do not believe that a simplistic linear correlation is at work here, the latter approach would not be useful. Nor do the amplifying/aggravating/triggering effects of offspring sex selection on conflict exclude the possibility of significant conflict in societies where offspring sex selection is not prevalent. Thus, because the relationship between offspring sex selection and societal conflict is complex and includes diverse sets of sufficient conditions, an approach such as process tracing that can embrace such complexity and nuance is most useful.

Employing process-tracing techniques, we show how a combination of gender inequality and environmental stress can produce conditions

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7. Thomas F. Homer-Dixon, "Strategies for Studying Causation in Complex Ecological-Political Systems" (Toronto: Environment, Population, and Security Project, University of Toronto, June 1995).

8. William T. Divale and Marvin Harris do this for a sample of tribal peoples. They find a very strong relationship between offspring sex selection and bellicosity. Scholars have continued to debate their methods, data, and theories, however. See Divale and Harris, "Population, Warfare, and the Male Supremacist Complex," *American Anthropologist,* Vol. 78, No. 3 (September 1976), pp. 521–538.

that encourage offspring sex selection, and how offspring sex selection may contribute to greater violence and disorder within and between societies. We examine the means by which sex ratios are artificially skewed through the practice of female infanticide or sex-selective abortion. To obtain a truer picture of the sex ratio in the young adult populations in China and India, we also consider the effects of differential infant (ages 0–4) and youth (ages 5–14) mortality rates between the sexes, as well as differential suicide rates. The sex ratio of the 15–34 year age group, we argue, is especially interesting to theorists studying societal and intersocietal conflict, given that young men in this age group are responsible for virtually all violent criminal behavior.

Below we review the historical origins of offspring sex selection, noting in particular its prevalence in Asia. We explain offspring sex selection as a response to environmental stress that is eventually sanctioned by religious or other traditional authorities, and that sometimes persists even in the face of declining environmental stress.

The Emergence of Offspring Sex Selection

How and why did offspring sex selection originate in human society, and why has it persisted? The historical literature on offspring sex selection contains a variety of hypotheses and explanations concerning the origins and continuation of this practice. In our literature survey, we found two main environmental stresses—military invasion and chronically fragile subsistence systems—that are consistently linked to the emergence of *prevalent* offspring sex selection. By prevalent, we mean an act practiced by a nontrivial percentage of families at nearly every level of socioeconomic status that continues over time and typically goes unpunished even when such behavior is illegal. These two environmental stresses only initiate the societal move from occasional, idiosyncratic offspring sex selection to prevalent, typical offspring sex selection. Rendering it *persistent* over generations is a dynamic that underpins what we term *malevolently resistant policy.* This dynamic is, in effect, the drive for resource exclusivity through the creation of family/group boundaries that is often accompanied by the manipulation of traditional religious beliefs.

MILITARY INVASION

Military invasion traditionally threatens its victims in two fundamental ways: through physical extermination and through social extermination. The threat of physical extermination of a targeted group is initially felt most acutely through the loss of men—especially young men—who, acting as warriors, risk death to protect the group. Following victory, invad-

ers would often single out surviving warriors and other males of fighting age for execution.

The social extermination of a group, on the other hand, is felt most acutely when the invaders seize women for concubinage, marriage, or slavery. Without women to provide and socialize children, the targeted group is doomed to social extinction within a generation or so.

Preventing the physical loss of men and the social loss of women is therefore vital to group survival. The distinction between physical and social loss is important to understand because, as we show later, preventing the social loss of women is sometimes viewed as best achieved through their physical loss.

Military invasion can also lead to food shortages and disease, with death resulting not only on the battlefield but also in, for example, refugee camps, thus placing huge environmental stress on the targeted group. Although such factors may contribute to a group's decision to engage in prevalent offspring sex selection, these are not the primary cause. Nor do all groups that suffer military invasion choose to practice offspring sex selection. Rather, it is the threat to group identity—often coupled with food shortages and other environmental stresses—that spurs some societies to engage in prevalent offspring sex selection.[9]

At least three dynamics linked to military invasion seem to encourage this practice. The first is the need to stanch the physical loss of men, which in turn puts a greater premium on the birth of male infants. A group suffering such a loss may therefore consider the investment of time and energy required to ensure the survival of a baby (commonly two years, including birth and minimum length of traditional lactational amenorrhea, or suppression of menses) as wasted on a female infant when the real need is to replace lost males. Sex-selective infanticide increases the likelihood that the mother can deliver another child within a year, rather than within two and a half years.

Second, the birth of female infants can increase the vulnerability of the targeted group and thus threaten its identity. The need to protect the honor of girls and prevent their social capture through sexual union with members of the invading army opens the group to further physical loss of men. The more females, the greater the vulnerability. The social loss of these females (and the consequential physical loss of males attempting to protect them) may seem more costly than the physical loss of these women through offspring sex selection during the years of war or occupation.

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9. See Judith Banister, *China's Changing Population* (Stanford, Calif.: Stanford University Press, 1987).

Third, girls will eventually require suitable marriage partners. To prevent their social loss, the group must find them husbands from within the group or from other acceptable groups. Invaders, on the other hand, seek out women from the targeted group as sexual partners, usually by force, to weaken its morale and sense of identity. Even if the targeted group is able to keep the social capture of its women to a minimum—for example, by secluding them in locations protected by men from the group, the likely loss of some of these men in this endeavor decreases the number of prospective husbands. A further complication is the desire of higher-placed families or clans not to dilute or "pollute" their inheritances by giving their daughters to men from lower-class families or social outcasts, even if they are members of the same group. Thus the obligation to find suitable marriage partners for the women of the targeted group becomes especially onerous during military invasion and occupation. The physical loss of the daughters at birth may therefore seem less serious than their social loss to in-group or out-group undesirables when the group is fighting for its identity.

Not all cultures have responded to military invasion by resorting to female infanticide, however. For example, Jewish lineage is accorded the child of any Jewish woman. Thus even if groups succeeded in the social capture of Jewish women, the offspring of any unions were still considered members of the Jewish community. This alternative response is evident even today. For example, the Imam of Zagreb urged Bosnian Muslim men to marry women raped by Serbian forces during the Bosnian conflict in the 1990s, and to raise any children resulting from such rapes as Bosnian Muslims.[10]

Another response to is to make young females unattractive to invaders. The persistence (though perhaps not the initiation) of foot binding may be related to the desire of Han Chinese to prevent the social capture of their daughters by invading Mongols. Similarly, the Jewish practice of married women shaving their heads bald (and wearing wigs to cover their baldness) is generally understood to have been a response to the continual threat of rape by invaders or during pogroms. When confronted by invaders, the married women would take off their wigs in an effort to repel their attackers. It is also possible that the practice of infibulation, an extreme form of female genital mutilation in which the outer labia are sewn together, arose from similarly threatening historical situations.

In the context of military invasion, then, offspring sex selection repre-

10. See Elaine Lutz, "When the Women Cry, Who Will Listen?" *International Relations Journal* (San Francisco State University), Vol. 14, No. 2 (Spring 1993), pp. 29–32.

sents a strategy of resistance (as opposed to adaptation) to the extreme stress produced. It is, in other words, a predatory social practice designed to implement that resistance.

CHRONICALLY FRAGILE SUBSISTENCE SYSTEMS

Societies in chronically fragile subsistence systems may respond to risks from, for example, threatened or real famine by engaging in offspring sex selection. Nature usually takes care of these fragile systems by limiting the fertility of the women in the group. For example, in the early twentieth century, traditional Aboriginal women in Australia were infrequently fertile, ovulating only once every several years. A certain percentage of body fat is required to maintain estrogen levels at the point necessary for female fertility: When body fat is chronically below this percentage, amenorrhea and lack of fertility result.[11] Other types of natural fertility control—such as extended nursing and sexual taboos during lactation—are used in fragile subsistence systems.[12]

In some of these systems, however, the body weight of women may not remain low enough to prevent fertility. Despite lactation-related sexual taboos, women may bear more children than the system can support. In some such cases, offspring sex selection occurs; in others, non-sex-selective infanticide may result. The brief case studies below illustrate this diversity of response.

Arctic peoples such as the Inuit live in one of the world's most inhospitable climes. Historically, survival was a day-to-day struggle. With agriculture all but impossible, hunting and fishing remain the primary means of providing sustenance for the group. Over time, a natural sexual division of labor developed: Men focused on hunting and fishing, while women cared for the children, rendered the meat into usable food, and cured hides for clothing and shelter. Hunting and fishing in Arctic conditions can be treacherous, and men are often killed or disabled in the process. Given the lack of alternative food sources (at least in the past), the strict division of labor along gender lines, and men's physical advantage in procuring food, males became more important to the group. The birth of male babies meant a steady supply of new hunters and fisherman, so that even if some were killed or disabled, others could take their place.

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11. See Richard B. Lee, "Lactation, Ovulation, Infanticide, and Woman's Work: A Study of Hunter-Gatherer Population Regulation," in Mark Nathan Cohen, Roy S. Malpass, and Harold G. Klein, eds., *Biosocial Mechanisms of Population Regulation* (New Haven, Conn.: Yale University Press, 1980), pp. 321–348.

12. See Herbert Aptekar, *Anjea: Infanticide, Abortion, and Contraception in Savage Society* (New York: William Godwin, 1931).

This ability to feed the entire group required the maintenance of a delicate balance between the number of hunters and the number of nonhunters (i.e., women, children, and the elderly). An excess of nonhunters meant that everyone in the group would experience hunger and perhaps starvation. The Inuit developed a variety of methods to hold down the number of nonhunters: Elderly members might be asked to leave the group, mothers might nurse for years to reduce their fertility levels, and in some cases the group might resort to offspring sex selection. The practice of female infanticide reduced the number of infants who would never become hunters; it also lowered the number of potential mothers. Even today, despite some modern conveniences and sophisticated hunting equipment, the male-to-female ratios in several Inuit groups still exceed normal ratios.[13]

In many societies, the type of food procurement system plays a role in determining the prevalence of female infanticide. Hunting, large animal husbandry, and agriculture involving heavy plowing render sons more valuable than daughters.[14] Male-centered food production systems go hand in hand with patrilocality, wherein a wife not only joins her husband's family upon marriage but also severs daily contact with her natal family. In such cultures, females are usually not allowed to inherit real property, because when they marry, it would fall into the hands of their husbands' families. Even before marriage, girls are viewed not as family members but as houseguests. Investment in their care by their natal families is therefore considered a complete loss: A common proverb in patrilocal cultures is, "Raising a daughter is like watering a plant in another man's garden." Sons, who stay with their families to care and provide for them, are thus considered more valuable.[15]

The combination of male-centered food production systems and patrilocality virtually guarantees not only women's lowly place in society but also the hefty dowries necessary to marry them off. The dowry system furthers erodes any natural affection parents might have for their daughters, for their birth may consign their families to financial ruin.[16]

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13. See Eric Alden Smith and S. Abigail Smith, "Inuit Sex-Ratio Variation: Population Control, Ethnographic Error, or Parental Manipulation?" *Current Anthropology*, Vol. 35, No. 5 (December 1994), pp. 595–624.

14. See H. Yuan Tien, *China's Strategic Demographic Initiative* (New York: Praeger, 1991); and Barbara D. Miller, *The Endangered Sex: Neglect of Female Children in Rural North India* (Ithaca, N.Y.: Cornell University Press, 1981).

15. See Fei Hsiao-tung, *Peasant Life in China: A Field Study of Country Life in the Yangtze Valley* (1939; reprint, London: Routledge and Kegan Paul, 1962).

16. See Ho Ping-ti, *Studies on the Population of China, 1368–1953* (Cambridge, Mass.: Harvard University Press, 1956).

According to an old Cantonese saying, "A daughter is a thief." The triple threat of patrilocality, male-oriented food provision systems, and the dowry thus predisposes cultures toward female infanticide as a rational choice. (A logical inference from this hypothesis is that in matrilocal cultures and in cultures where females provide most of the food—for example, rice cultures, sericultures, and small animal cultures—daughters are not a drain on their natal families, but important assets. In these cultures, women are often allowed to inherit real property, and a bride-price system (a type of groom-dowry system) develops in place of a dowry system. In these cultures, such as existed in southern India before independence in 1948, female infanticide was virtually unknown.

As in the case of military invasion, the physical loss of daughters in certain fragile subsistence systems is perceived as less risky than their social loss. The social loss of daughters through patrilocality can bring great costs to the household. Rather than suffer those costs or change to a system where costs are equalized, some groups prefer to accept the physical loss of their daughters through female infanticide. Furthermore, some societies (e.g., the Inuit) perceive this physical loss as the logical outcome of a zero-sum game, where the birth of daughters may imperil the delicate balance between food providers and nonfood providers, both at the time of their birth and well into the future. Resistance to sharing costs and risks equally within a family can thus help to create the predatory social practice of female infanticide.

Occasionally, this resistance to sharing costs and risks has resulted in male infanticide. In China, as the land-to-man ratio fell over succeeding generations, many farming families worried that the survival of several sons to manhood would mean the division of their land into parcels too small to allow for even subsistence agriculture. To avoid this, parents would kill all but one or two of their sons. In so doing, the rest of the family could avoid watching their inheritances dwindle to the point of having to sell off their land.[17]

In some cultures, all infants—whether male or female—are killed when famine strikes.[18] Indeed, in some cases, the infants are also canni-

17. See Fei, *Peasant Life in China.*

18. The following anecdote, from the executive director of World Vision International, indicates that offspring sex selection in time of famine is occurring in cultures not traditionally associated with this practice: "I flew to Kapoeta in southern Sudan. The region was in the midst of famine; 250,000 people had already starved to death. As is common in Africa, when we landed on the dusty runway families came from miles around to see who had arrived. They knew we were from an aid organization, so mothers held up their emaciated children to show us how much they needed our help. It didn't take me long to notice the children's distended stomachs—a sure sign of mal-

balized as a source of food.[19] In other cultures, risks are shared, as entire families choose starvation over killing their infants or other children. As noted above, bringing women into the food provision system may equalize costs to the point where daughters become as valuable as sons, thus obviating the need for female infanticide. In some cases, however, predatory social practices such as female infanticide may achieve cultural acceptance and serve the needs of a malevolently resistant policy, thus ensuring continuation of the practice long after the "rationality" of the choice in the face of environmental or other stress has faded.

The Persistence of Offspring Sex Selection

What causes female infanticide to persist, in some cases outlasting the very conditions that produced it? How do female infanticide and offspring sex selection become such stubborn cultural practices, lasting in some cases hundreds of years past the last military invasion or famine? In the historical literature, two forces appear to encourage the continuation of offspring sex selection. The first is the development of religious sanction for the practice, and the second is the creation of a rigid system of hypergyny (i.e., marriage of a female to a male of higher status) within the society.

THE ROLE OF RELIGION

In some cultures, female infanticide is prevalent even when sacred texts condemn or prohibit the practice. Opposition by religious institutions subsides over time, as religious leaders adopt the practice in their own households during periods of invasion or famine. Tacit religious sanction allows continuation of the practice even after its supposed rationality can no longer be argued. This occurs most often when religious leaders and other prominent individuals derive personal advantage from the practice. The decision of religious leaders to practice female infanticide can thus be viewed as a means to cushion their own households from risk in times of environmental stress.

Nowhere is this dynamic more apparent than in Hinduism. Early

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nutrition. But it was several minutes before I realized that in this sea of humanity, the mothers were only holding up sons; there were no daughters. In the familial hierarchy, girls were the last to be fed and the first to die. By the time we arrived, they were dead." Quoted in World Vision International, "Females: He Created Them," *World Vision Today,* Spring 1998, p. 2.

19. See, for example, Jasper Becker, *Hungry Ghosts: Mao's Secret Famine* (New York: Free Press, 1996).

Hindu religious texts (the Vedas) appear to hold all human life sacred. Indeed, in pre-Vedic and even Vedic periods, women were more highly valued by society and in religious thought than they are today. Women could be warriors, even generals, and they had a say in government and in their choice of husbands. Marriage involving bride-price was common. Some early Hindu texts appear to proscribe infanticide. For example, Vasishtha warned that only three acts could make a woman impure: becoming an outcast, murdering her husband, or killing her unborn child (Vas. Xxviii.7). According to Gautama, aborting a fetus was just cause for a woman to become an outcast (G.xxi.9).

Following the end of the Vedic period and the subsequent Moghul invasions, new religious texts and interpretations began to emerge. Among the most influential was the Manusamhita, or Code of Manu. Herein was developed the idea that the primary reason for a man to marry was to produce a son who could perform certain rituals for the father's soul after death. Without a son to perform these rituals, the father's soul would be consigned to hell (*put*). In addition, Hinduism began to assume that children were not living souls until approximately two years of age, and that the death of a child before that age was not the death of a complete human being. Causing the death of a child younger than two was thus not considered a religious transgression. Given the strength of son preference in India resulting at least in part from the environmental catalysts discussed above, this evolving religious understanding soothed the moral sensibilities of families that chose female infanticide.

The moral ambivalence displayed toward female infanticide can also be found in Chinese Buddhist culture. As Nicholas Kristof and Sheryl WuDunn write, "A popular moral text that was distributed widely during the sixteenth and seventeenth centuries [in China] orders people not to kill babies. But the injunction against infanticide is simply one on a long list of things that people should not do, such as leaping over food served on the floor; stepping over a person lying on a floor mat; weeping, spitting, or urinating when facing north (the direction of the emperor); spitting at a shooting star; or pointing at a rainbow. If you commit these sins, the Arbiter of Human Destiny would shave three or three hundred days off your life. The text does not indicate that infanticide is any worse than, for example, urinating when facing north."[20]

In another Chinese Buddhist text, infanticide carried a 1,000-point demerit against one's soul, the same level as for writing erotic literature.[21]

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20. See Nicholas D. Kristof and Sheryl WuDunn, *China Wakes: The Struggle for the Soul of a Rising Power* (New York: Vintage, 1994), p. 227.

21. See Ho, *Studies on the Population of China, 1368–1953,* p. 60.

As in India, specifically female infanticide was most popular to the pre-twentieth-century Chinese mind. For example, one Chinese philosopher, Wang Shih-to (1802–89), advocated mass female infanticide as a way to control population growth.[22] As in Hindu culture, daughters in Buddhist cultures cannot perform the "incense and fire" rites for their ancestors' souls—only a son may perform these important religious duties. In another striking parallel to Indian culture, Chinese culture eventually embraced the view that "infanticide was not considered terrible in part because babies were not considered fully human until they were one year old or had a full set of teeth."[23] One Chinese fable even suggests that the gods smiled on acts of infanticide: "[A young couple] worried that their infant would take food that could better be used by the man's sick mother, so they buried the baby alive. This act of filial piety so touched the gods that they arranged for the couple to find a pile of gold as they dug their baby's grave."[24]

Not all religions have sanctioned offspring sex selection. The practice, once common among the pre-Islamic nomadic tribes of the Arabian Peninsula, was essentially condemned when the prophet Mohammed asked his followers to imagine themselves before God on the day of judgment, then added: "And when the girl-child that was buried alive is asked for what sin she was slain, . . . then every soul will know what it hath produced."[25] The power of that one line of scripture was enough to deny religious sanction to what had become a persistent practice. Without that sanction, practitioners of female infanticide were deemed to be

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22. See Robert Hans van Gulik, *Sexual Life in Ancient China: A Preliminary Survey of Chinese Sex and Society from ca. 1500 B.C. till 1644 A.D.* (Leiden, Netherlands: E.J. Brill, 1974), p. 249.

23. See Kristof and WuDunn, *China Wakes,* p. 227; and Lillian M. Li, "Life and Death in a Chinese Famine: Infanticide as a Demographic Consequence of the 1935 Yellow River Flood," *Comparative Studies in Society and History,* Vol. 33, No. 3 (July 1991), p. 503.

24. See Kristof and WuDunn, *China Wakes,* p. 227; and Li, "Life and Death in a Chinese Famine," p. 504.

25. Avner Giladi, "Some Observations on Infanticide in Medieval Muslim Society," *International Journal of Middle East Studies,* Vol. 22, No. 2 (May 1990), p. 186. The verse cited is verse 8 of sura 81. In sura 16, verses 57–59, the Koran also passes negative moral judgment on fathers ashamed of the birth of their daughters: "And they assign unto Allah daughters—Be He Glorified!—and unto themselves what they desire [e.g., sons]; When if one of them receiveth tidings of the birth of a female, his face remaineth darkened and he is wroth inwardly, He hideth himself from the folk because of the evil of that whereof he hath had tidings [asking himself]: Shall he keep it in contempt, or bury it beneath the dust? Verily, evil is their judgment." Ibid., p. 187.

beyond the moral order of Muslim society (except in Islamic societies bordering India).

Historically, then, religion has taken a variety of approaches toward offspring sex selection. This suggests that a more fundamental dynamic must be at work in decisions to participate in this practice.

THE IMPERATIVES OF HYPERGYNY

In the absence of military invasion or chronically fragile subsistence systems, it would be difficult for religious sanction alone to perpetuate the practice of female infanticide in certain societies over the course of centuries, if not millennia. A more basic factor must be in play that elucidates the threat inherent in every female birth.

We argue that the answer lies in the family's perceived threat of loss of social boundaries with the birth of every daughter. Social boundaries create divisions among people: divisions of identity, wealth, power (in all its forms), privilege, risk, vulnerability, and security. Boundaries allow the family or group to exclude others from sharing its resources. They also shield it from the suffering that a lack of resources can produce. Only by creating and maintaining social boundaries can families and groups perpetuate inequality in resource accumulation and access. During periods of environmental stress, a family or group with strong social boundaries may not need to make adjustments to guarantee its safety; in fact, they are able to resist making any such adjustments. In contrast, nonfamily or nongroup (i.e., out-group) members are likely to be more vulnerable because they bear the brunt of any sacrifice, suffering, or other adjustment resulting from the environmental stress. Thus the in-group's resistance to making adjustments to environmental stress results in disproportionate adjustment for the out-group. There is, however, an obvious glitch to the logic of social boundaries: The in-group's exclusionary access to resources is always vulnerable because of the human need for exogamy—that is, the need to look beyond one's kin group for suitable marriage partners.

Families, however defined, are the unit around which foundational social boundaries are erected. A family's accumulation of wealth, power, security, and so on can be perpetuated only through inheritance. Without a next generation to maintain the family's social boundaries, and thus the accumulation of resource exclusivity, the effort expended in accumulation is wasted, as are the resources accumulated. This was the dilemma, for example, confronting eunuchs in imperial China: For centuries eunuchs fought for the right to adopt uncastrated sons, who could give them families and to whom the eunuchs could bequeath their riches.

Theoretically, if families could inbreed, resource accumulation would

remain intact as long as the family produced both sons and daughters. But because inbreeding produces terrible genetic consequences, a fact recognized in virtually every society throughout history, humans turn to exogamy.

The need to exchange marriage partners outside of the family (generally third cousins and beyond) creates a dilemma. New generations must be produced for social boundaries and resource exclusivity to be maintained, yet the marriages required for such reproduction may compromise those same social boundaries and imperil resource exclusivity. In this light, marriage is both extremely important and extremely perilous.

How can the threat to social boundaries and resource exclusivity be minimized in the context of exogamous marriage? Conceptualizing the choice in this way permits some generalizations about family behavior concerning sons, daughters, marriage, inheritance, and a wide variety of social phenomena that otherwise could not be made. We find that these generalizations hold true in a variety of cultures throughout time, and apply not only to family-based resource exclusivity but also to ethnic-, class-, and caste-based systems of resource exclusivity.

To illustrate how a family or group seeks to minimize the threat to social boundaries and resource exclusivity, we assume the following three conditions: (1) family-based accumulation of resources or resource access of persistent value, (2) the desire to maintain social boundaries that make possible accumulation and resource exclusivity, and (3) the need for exogamous marriage for biological reasons. From these assumptions, we derive seven propositions.

First, in most traditional economies, families do not leave marriage to chance: Rather, they strictly control the choice of mates for their children. In these economies, the family seeks to keep sons within its social boundaries, for at least three reasons: (1) sons are better able to provide physical defense of resource accumulation and resource exclusivity; (2) sons are likely to be the primary creators of additional accumulation in societies centered around hunting, large animal husbandry, harsh land agriculture, or predatory warfare; (3) sons are capable of producing more children than daughters. As H. Yuan Tien, a noted scholar of Chinese demography, writes, "More children, particularly boys, augment productive capacity and future old-age security. Moreover, the need to have a few children (and a son at least) goes beyond these concerns. The rural reality, according to those familiar with the village life, is that one's survival and ability to fend off hostile neighbors or to dominate others has been and still remains a function of one's family size and kinship groups."[26]

26. See Tien, *China's Strategic Demographic Initiative,* p. 202.

Second, daughters given in marriage to another family are denied access to the natal family's accumulated wealth so that the social boundaries and resource exclusivity of the natal family can remain intact. Daughters are not allowed to inherit family accumulation to any significant degree, especially not land. Indeed, despite the passage of laws that assert a woman's right to inheritance, many traditional societies continue to favor males in this regard.

Third, to minimize penetration of their social boundaries, families choose their daughters' husbands from families of higher social status (hypergyny).[27] Daughters should not be married off to men from families of lower status. A hypergynous strategy ensures that if social boundaries of the daughter's family are altered, it will be in a positive way. In Indian society, as Ruki Jayaraman, notes, "Higher castes, to maintain their position, made castes rigid. It is this rigid caste system, and the goal to maintain rigid castes, that creates the oppression of women."[28] These sentiments are reflected in proverbs common in hypergynous cultures. For example, in the southeast of China, "the Cantonese and the Hokkiens refer to their daughters as 'goods on which one loses one's capital,' the point being that it costs money and effort to raise and train a girl only for the investment to be handed over to her husband's family when she married."[29] Most benefits to the family of a daughter in a hypergynous marriage may be largely intangible: For example, if the groom's family is favorably disposed toward the bride's family, it could extend to them protection or other forms of assistance. Hypergynous unions thus raise the status of the bride's family. The giving of a daughter in marriage signifies some measure of alliance between the two families, extending a social network that allows the daughter's family to thrive and maintain their accumulation and resource exclusivity.

Fourth, the giving of a daughter in marriage represents a form of tribute from a lower-status party to a higher-status party. A nonreciprocated provision of a bride connotes the subordinate status of the bride's family vis-à-vis the groom's family: thus the Chinese saying, "The family of the

27. The most important empirical and theoretical studies of hypergyny are those of Mildred Dickemann, who for many years was an anthropologist at the University of California at Riverside. See, for example, Dickemann, "Paternal Confidence and Dowry Competition: A Biocultural Analysis of Purdah," in Richard D. Alexander and Donald W. Tinkle, eds., *Natural Selection and Social Behavior: Recent Research and New Theory* (New York: Chiron, 1981), pp. 417–438.

28. Ruki Jayaraman, visiting professor of political science at Brigham Young University, 1991–96, communication with authors, April 16, 1996.

29. See Hugh D.R. Baker, *Chinese Family and Kinship* (London: Macmillan, 1979), p. 41.

married daughter holds its head down, while the family of the man whom she has married holds its head up."[30] In the wake of military invasions, for example, daughters were themselves offered as tribute, which is probably at the root of the humiliation felt by families giving their daughters away in marriage. Dowry, or wealth tribute, usually accompanies the bride tribute.

Fifth, in accordance with Mildred Dickemann's theory of hypergyny, in societies that maintain social boundaries, one detects an overall upward movement of women as their families struggle to arrange marriages that will not compromise their own social standing.[31] Many, perhaps most, marriages are isogamous (marriages between spouses of equal social rank); otherwise they will be hypergynous. This results in at least three demographic corollaries: (1) families at the highest level of society cannot marry off their daughters without severely damaging their social boundaries; (2) families in the middle strata can arrange the marriage of a few daughters without suffering critical loss of their status and accumulated wealth; and (3) families on the lowest rungs of the social ladder may not be able to find wives for their sons.

Sixth, when the marriage of daughters would be too costly or socially threatening, families pull them out of the marriage market either by engaging in female infanticide or by promoting female celibacy. In the past, some cultures created elaborate systems of nunneries or secular celibate sisterhoods, where families would often pay a "dowry" to such institutions in return for taking in their daughters. The higher the status or the more exclusive the identity of the family, the more inclusive the disposal of daughters becomes. In Japan, for example, the daughters of several emperors were sent to nunneries. Some Rajput clans in India killed all of their female infants (before the British intervened to stop the practice), as did the tribal Khonds. For the Rajputs, the rationale was societal status; for the Khonds, it was ethnic identity. Middle-class families might make useful alliances by marrying off one or two of their daughters, but beyond that number the burden becomes too great to bear, thus increasing the likelihood of female infanticide.

Seventh, at the lowest levels of society, surfeits of unmarriageable

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30. See Arthur Henderson Smith, *Village Life in China: A Study in Sociology* (New York: F.H. Revell, 1899), p. 286.

31. See Mildred Dickemann, "The Ecology of Mating Systems in Hypergynous Dowry Societies," *Social Science Information,* Vol. 18, No. 2 (May 1979), pp. 163–195; Mildred Dickemann, "Female Infanticide, Reproductive Strategies, and Social Stratification: A Preliminary Model," in Napoleon A. Chagnon and William Irons, eds., *Evolutionary Biology and Human Social Behavior: An Anthropological Perspective* (North Scituate, Mass.: Duxbury, 1979), pp. 321–367.

males start to develop. The greater the number of daughters taken out of the marriage market and the greater the upward movement of other daughters through hypergynous marriages, the greater the number of unmarriageable males at the lower levels. At these levels, women may be sold into isogamous or hypogynous marriages (i.e., marriages to men of lower status)—bride-price instead of bride dowry may be the norm. At the lowest levels, then, there may be little incentive to dispose of daughters, and the birth sex ratio may be the most normal of any level in society.

COUNTERFACTUAL ANALYSIS

This analysis yields at least two counterfactuals. First, in societies where risk and wealth are shared more equally, or where family accumulation and resource exclusivity cannot persist over time, or where they can change quickly (as in a modern market economy), there should be greater reciprocal exchange of daughters. In such cases, female infanticide is less likely. This is one reason why offspring sex selection in, say, medieval Germanic peasant villages appears to have been almost nonexistent, and why the British promoted *ekdas*—exchange marriage collectives—to stem female infanticide in colonial India. In these cases, reciprocal exchange of daughters was commonplace, and class differences were less extreme.

Second, as previously mentioned, in economies where women are the primary creators of wealth—or at least equal creators of wealth—and where predation is not traditional, some matrilineal inheritance may occur. As a result, daughters become more valuable, and female infants are less likely to be killed. In areas where the economy is based on certain types of rice agriculture or sericulture, for example, women produce the wealth, and female infanticide is rare. As a result, some areas of China, such as the Pearl River Delta, and much of southern India do not exhibit highly skewed sex ratios. The sex ratios in most of Southeast Asia are nearly normal, perhaps again a function of women's greater role in economic productivity.

There is one important caveat regarding these counterfactuals: When social policy mandates that families have no more than one child, even in more modern quasi-egalitarian societies, the overwhelming preference is still for sons, because of their greater potential for protecting and augmenting their families' resources and maintaining their boundaries. Indeed, in societies with one-child policies, the difference between a family unit that endures and one that does not may rest on the birth of that one son. As a result, offspring sex selection may intensify, despite women's seemingly more egalitarian status. This dynamic is playing itself out in, for example, modern China, despite laws that place responsibility for the

care of aged parents on both daughters and sons and equalize their inheritance rights.

Conclusion

Historically, prevalent offspring sex selection has been a response to events or conditions that create huge environmental stress, such as military invasion or the presence of a chronically fragile subsistence system. In some cultures, prevalent offspring sex selection persists because it helps to preserve group or family social boundaries and resource exclusivity. In many cases, its persistence has been further guaranteed by religious sanction that evolves over time and by the imperatives that hypergyny forces on households of different social rank. As we discuss in subsequent chapters, however, there is a societal price to be paid for this predatory practice.

Organization of the Book

The remainder of this book is organized into six chapters. In chapter 2, we survey the practice of offspring sex selection throughout human history. We begin with a brief introduction to the practice of infanticide and induced abortion in the animal world, followed by a review of non-sex-selective practices of human infanticide. We then discuss the types of data that indicate the presence of offspring sex selection and the strengths and weaknesses of various data sources. Next we assemble documentation of sex-selective infanticide in ancient Greece and Rome, as well as in historical Europe and other parts of the world. We close with a discussion of contemporary sex-selective practices.

The third and fourth chapters examine offspring sex selection in India and China. For each country, we offer a history of the evolution of the practice, followed by a discussion of its current sex ratios and assessments and comparisons of various data sources. We disaggregate regional, tribal, and urban/rural population data to estimate the number of surplus young adult males, or bare branches, in each society, and then project figures out to the year 2020.

Chapter 5 lays out the theory and history linking the presence of significant numbers of bare branches to increased instability and violence within and between societies. The theoretical literature is diverse, spanning social sciences such as anthropology, biology, criminology, psychology, organization behavior, and sociology. All concur that the existence of sizable numbers of surplus young adult males poses a potential threat to society. Bare branches, who are frequently the least educated and least

skilled, also tend to be the most prone to use violence to obtain redress of their low socioeconomic status. Following this discussion, we identify historical cases in which bare branches arguably played a destabilizing role: Case studies include the Nien Rebellion in China, the Reconquista in Portugal, precolonial Oudh in what is now the state of Uttar Pradesh in India, and colonial Taiwan. We then probe additional cases for the presence of bare branches, including the role of eunuchs and monks in pre-twentieth-century China, as well as other cases, such as historical Polynesia.

In chapter 6, we examine China's and India's contemporary bare branches, noting similarity in their characteristics to the bare branches of earlier eras, including transience, low socioeconomic status, congregation, and relative lack of education. In addition, we perform a behavioral analysis of contemporary bare branches, noting their predisposition to substance abuse, violent crime, and collective aggression. Aggregate correlational analysis of sex ratios and violent crime rates demonstrates strong, statistically significant results. We also discuss the logical possibilities for government intervention to counteract the destabilizing nature of high-sex-ratio societies. Many of the logical possibilities turn out to be unsavory or less than effective; others may create greater conflict in the international system. Nevertheless, there are some positive initiatives that may ameliorate the situation over time.

Finally, in chapter 7, we explicate why it is increasingly important for all nations to understand the very different security calculus of high-sex-ratio societies. The extremely low status of women in these societies negatively affects their prospects for both democracy and peace. Given that almost half of humanity resides in this area, the implications for the rest of the world could be profound.