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**CROSS-NATIONAL COMPARISONS OF FEMALE CRIME AND THE GENDER
GAP**

A Thesis in

Sociology

by

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ABSTRACT

National development is an important and complex process with significant consequences for many aspects of social life. There is contention surrounding the differential affects of development on men and women. Furthermore, it has been suggested that development can impact a country's level of criminal offending. This dissertation brings together these themes by investigating the relationship between development and the gender gap in offending.

Previous investigations of this relationship are limited and they have somewhat mixed results. This project is both a replication and extension of an article by Steffensmeier et. al. (1989) investigating several alternative explanations for the relationship between development and the female share of offending. A major theme in the literature on female crime has focused on the connection between female status and female crime. The liberation hypothesis suggests that development leads to greater equality between men and women, and that these changes in gender equality lead to a greater female share of offending. Alternatively, it has been argued that development marginalizes females relative to males, also leading to an increase in the female share of offending. Other research has suggested different ways in which development may impact the female share of offending. Development may lead to changes in the formalization of the mechanisms of social control, which can differentially impact male and female arrest rates. Additionally, the growth in opportunities for consumer crime that is associated with development may differentially impact male and female offending rates and the proportion of arrests accounted for by females.

This research asks the following questions 1) What are the effects of development

on female crime and the gender gap? 2) To what extent are the effects of development on the female share of offending explained by changes in the relative status of women, opportunity for consumer crime, and formalization of the mechanisms of social control?

These questions are assessed using international sex-specific arrest data from the Interpol (International Criminal Police Organization) and population figures from the U.S. Census International Database. Five offense categories are included: total crime, homicide, robbery, theft, and fraud. The primary dependent variable is the female percentage of arrests, a measure of the proportion of all arrests that are of females, controlling for the sex distribution in the population. Data for predictor variables comes from the World Bank, United Nations, and the International Labor Office. Ordinary Least Squares regression techniques are used to assess the relationship between predictor variables and the female percentage of arrests. The mediation effects of formalization, opportunity, and relative female status are assessed using the Clogg Test for mediation.

Overall, the results demonstrate that more highly developed countries have a higher female percentage of arrests, although there is little variation cross-nationally in the female share of arrests for robbery and homicide. More formalized criminal justice systems are associated with a higher female share of total crime and robbery offending. The effect of opportunity for consumer crime was difficult to discern given its correlation with development, but increased opportunity is related to a higher female share of theft offending. Assessment of relative female status demonstrated that it was predictive of the FPA for fraud, but that it had very weak effects on the female share of arrests for total crime, homicide, robbery and theft.

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Chapter 1

Introduction and Literature Review

Introduction

The present research examines the impact of development on female crime and the gender gap in offending and builds on several themes in sociology and criminology that have received considerable attention in the past several decades. Specifically we ask: 1) What are the effects of development on female crime and the gender gap? 2) To what extent are the effects of development on the female share of arrests explained by changes in the relative status of women, opportunity for consumer crime, and formalization of the mechanisms of social control?

This research builds and elaborates on several major trends in sociology and criminology. First, it contributes to the renewed interest in comparative and cross-national research. Academics have acknowledged that comparative research has been declining over the past several decades and have called for a renewal of scholarship in this field (Howard et al., 2000; Ragin, 1989; Smelser, 2003). This research takes advantage of the benefits of a comparative approach. By testing relationships in multiple environments, cross-national research allows a more accurate assessment of the generalizability of theories and of the factors that may influence the strength of the proposed relationships. Another advantage of cross-national research is that it provides increased variation in variables of interest, allowing for a more rigorous test of explanations. The present research takes advantage of these benefits by including data from multiple countries at many levels of development.

Second, this research contributes to the large body of knowledge on gender and

crime and the impact of female status on female rates of offending. In recent years there has been a great deal of research and debate about the nature of female crime as a part of a broad interest in gender stratification. A significant literature currently exists on trends in female crime, patterns and contexts of crime for males and females, and the ability of sociological theories of crime to explain crime committed by women (for reviews see Chesney-Lind, 1997; Daly, 1994; Steffensmeier and Allan, 1996). One perspective on the relationship between female status and female crime that has received a great deal of attention is the liberation hypothesis. This hypothesis suggests that equality in gender roles brings about an increase in the amount, and change in the type, of female crime (Adler, 1975, 1977; Austin, 1982; Chernoff & Simon, 2000). The present research includes an assessment of the liberation hypothesis, as well as several other explanations for female crime, and helps to flesh out the relationship between female status and the female share of offending.

Third, this research contributes to interest in the impact of development on crime in general and on the gender gap in offending in particular. A common theme in sociology is the impact of large-scale social change on female crime and the gender gap, including the impact of development. The goals of development are variously stated but include an increased standard of living, fulfillment of human potential, and maximization of national welfare (McMichael, 2000; Seers, 1979). The actual outcomes of the process of development, however, are not entirely clear. In addition to positive outcomes, including increased lifespan and education, some criminologists have suggested that development may have criminogenic consequences (Chernoff & Simon, 2000). The issue of the impact of national development on the status of women has also received

considerable attention. The present project connects to both the literature on development and the literature on gender stratification mentioned above. It assesses the impact of development on the gender gap in offending, as well as the effectiveness of mediating variables (including the relative status of women) at explaining the impact of development. This project is a replication and extension of Steffensmeier and colleagues 1989 article which uses data from the 1970's.

While there is a great deal of emphasis on these themes in the sociological and criminological literatures, several gaps persist. Empirical evidence on the relationship between national development and female crime is limited. This dissertation research is unique in taking a comparative approach by including many countries at multiple levels of development. This research also moves beyond previous work in the field by including more sophisticated measures of concepts of interest than those available previously (for example, improved measures of development). Additionally, like Steffensmeier et al. (1989) we test multiple different explanations for the relationship between development and the female share of offending. In addition to assessing the impact of development on female status, we examine other factors, such as changing criminal opportunity and the formalization of social control. We include tests of both the direct effect of development on the female share of offending and the extent to which these effects are mediated through factors such as female status, criminal opportunity, and formalization of social control.

This study also contributes to the long line of research on the impact of large-scale social change, and whether the impact of social change is similar or different for males and females. Much of the literature on development and globalization suggests

that development has different effects on gender, race, ethnicity, and class groups. Chow (2003) specifically argues that gender has not been sufficiently incorporated into the study of globalization. By using gender-disaggregated offending rates and specifically addressing the impact of development on female status, the present research begins to address this weakness in the current literature. Thus, this research addresses several gaps in the literature.

In the remainder of this chapter we elaborate on several of the themes touched on thus far. We begin with a brief summary of the literature on the concept of development. Next, the relationship between gender and development is addressed, including an assessment of the marginalization and modernization perspectives on women and development. The empirical literature on the relationship between development and female crime will then be reviewed. This chapter concludes with an explanation of the alternative ways in which development can impact the gender gap in offending.

The Concept of Development

The literature surrounding the concepts of development, modernization, and globalization is extensive and complex. The definition and measurement of development, as well as the question of whether and to what extent development is advantageous to different nations, and different populations within nations, have received a great deal of attention. This section provides an assessment of what is meant by development and how our understanding and measurement of this concept have evolved over time.

The United Nations Educational, Scientific, and Cultural Organization

(UNESCO) defines development as:

. . . an integral and interacting process, both requiring and precipitating far-reaching social, political, cultural and economic changes. It is by no means a unilinear process that moves steadily and smoothly toward some predetermined set of models and values. . . it is typically turbulent, often a downright disorderly and painful process (quoted in Shelley, 1981. p. xvi).

Traditionally economic measures, particularly gross domestic product, were the primary indicators of a country's level of development. However, writers have argued that economic development itself is not a sufficient measure of a country's level of development (Seers, 1979). Seers suggests that development involves the fulfillment of human potential and thus cannot be captured by national income alone. He proposes that poverty, unemployment, and inequality are the three components of development, although he goes on to argue that even these components are insufficient to spell out all aspects of development.

A rising standard of living is considered to be an important aspect of development. In this sense, several alternative indicators include measures of health (fertility, mortality, morbidity), education, control of resources, equitable distribution of resources, and representation in government. Operational measures of development vary from study to study. A sample of indicators of development from relevant studies include: gross national product per capita, growth in gross national product, gross domestic product per capita, life expectancy, infant mortality, population size, population growth, percentage of the population that is urban, industrialization, and kilowatt hours of energy consumed per capita.

To complicate matters further, while the different aspects of development are closely linked, they are not perfectly correlated, nor are relationships between the

different aspects of development consistently linear. For instance, Punchamukhi (1999) found a curvilinear relationship between per-capita income and a basic needs index. After a certain level of income is reached, any further increase does not bring about a substantial improvement in the basic needs index. The relationship between economic and social aspects of development can also differ for countries at different levels of development.

McMichael (2000) depicts development as a master concept of the social sciences with the goal of bringing a rising standard of living based in the European experience. He describes the development project as a post-World War II phenomenon through which nation-states were to become industrialized. In his assessment, development was unsuccessful in reaching this goal and was replaced by the globalization project.

Chow (2003) provides the following definition of globalization:

Globalization refers to the complex multifaceted process of worldwide economic, social, cultural and political expansion and integration which have enabled capital, production, finance, trade, ideas, images, people and organizations to flow transnationally across the boundaries of regions, nation-states and culture. The term encompasses the ever-changing and intensifying networks of global consciousness, system interdependence, human interaction and societal transformation with far-reaching consequences (Chow, 2003, p.444).

The benefits and detrimental impacts of globalization for countries at various levels of development, as well as for different gender, racial, ethnic, class, and age groups, have been thoroughly debated in research on stratification, economic and political sociology, social theory, and other areas within sociology and other disciplines. In the end, it has been established that worldwide massive changes have been transpiring in the last several decades in many spheres of social life.

A major theme in the development and globalization literature is the question of

whether development has the same effects on all population groups within nations (Glauser, 1999; PUNCHAMUKHI et al., 1999; SHANMUGASUNDARAM, 1999). The question of the effect of development on men and women, or whether development improves the status women, is especially important for this study and is addressed in the following section.

Gender and Development

A substantial literature addresses the relationship between development and the status of women, as well as the role of women in development. During the late 20th century the question of gender equality became a major issue on the global agenda (Inglehart & Norris, 2003). In the late 1970s there was an active movement to integrate women into existing development practices and to take a more “gender aware” approach (Koczberski, 1998). In 1979 the United Nations General Assembly held the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW). Its recommendations were adopted by 165 nation-states. The convention focused on the central role of the state in consolidating and reinforcing gender equality.

The Status of Women

The United Nations’ *Human Development Report* (1995) summarizes the changes in the status of women over the last twenty years as follows: “The progress of the past two decades can be summarized in simple terms: expanding capabilities and limited opportunities” (p. 34). Despite considerable gains in some areas, significant gender inequalities persist. The following statistics on the status of women and gender equality are drawn from the 1995 United Nations publication, *Human Development Report* (Haq,

1995) and from the United Nations report, *The World's Women 2000: Trends and Statistics* (United Nations, 2004).

According to these reports, the gender gap in primary and secondary schooling is closing, but women's education levels still lag behind those for men. Women have also made gains in access to higher education in most regions, but two thirds of the world's 876 million illiterate people are women. The United Nations reports that female life expectancy increased faster than male life expectancy in the last twenty years, except in Africa where overall life expectancy has decreased dramatically as a result of AIDS. The fertility rate has also decreased in the last two decades, lessening the burden on women of frequent child bearing and the risk of dying during child birth. Women's rate of employment has increased very little, and the rate of unemployment remains higher for women than for men. While the wage gap has decreased, women continue to receive considerably lower average wages than men.

The above mentioned reports suggest several explanations for the persisting wage disparities between women and men. These explanations include the following: women hold lower-paying jobs than men, women work in the informal sector at a greater rate than men, and in some cases women continue to be paid less than men for equal work. Women also receive a disproportionately small share of credit from formal banking institutions. The reports cite evidence that in many countries women do not have the same legal rights as men. Gender disparities persist in property rights, inheritance laws, laws related to marriage and divorce, rights to acquire nationality, rights to manage property, and rights to seek employment. Also, despite calls for gender equality, women are significantly under-represented in governments and political parties and at the United

Nations.

Another important issue is the feminization of poverty. According to the 1995 *Human Development Report*, 70% of the world's poor are women. Moghadam (1997) reports that the incidence of poverty among women appears to be on the increase.

Moghadam (1997) suggest several factors as being behind the feminization of poverty. These factors include: population growth, emigration of men, increasing family dissolution, low productivity, deteriorating environment, the economic recession of the 1980s, market transitions in former socialist countries, and an unequal distribution of household resources between men and women.

While overall development and female status are related, they are not the same concept. Several developing countries have made significant progress in gender equality, while the women in some highly developed countries have a relatively low status (Haq, 1995). "Growing affluence does tend to generate the expansion of literacy and schooling, the establishment of a social protection safety net, and the rise of white-collar jobs in service sector, but this process is not inevitable, nor does it necessarily automatically benefit women's lives" (Inglehart & Norris 2003, pp. 5–6). Inglehart and Norris (2003) performed a comprehensive analysis of the relationship between development and gender equality that led them to argue that development impacts gender equality in two phases. Industrialization and a mass movement of women into the paid labor force marks the first phase. In this phase fertility rates decline precipitously and women attain greater literacy and educational opportunities. Women begin to participate in representative government, but still have far less power than men. In the second phase, described as the postindustrial phase, women rise in management and professional occupations and also

gain more political influence through their presence in elected and appointed government positions. According to Inglehart and Norris (2003), currently only the more advanced industrial societies are moving in this second phase; over half of the world has not yet entered it. The following is a description of two major perspectives on the relationship between development and female status.

Perspectives on Women and Development: Marginalization and Modernization

The two major perspectives on the relationship between development and the status of women are referred to as marginalization and modernization (Scott 1986, Oropesa, 1997). The main premise behind the modernization perspective is that the ideational and structural changes that accompany development enhance the status of women (Oropesa, 1997). Changes that benefit women include the creation of factories, increasing employment opportunities, the potential for economic independence, urbanization, the broadening of educational opportunities, increased self-worth, and more life options (Giele, 1977; Horton, 1999; Oropesa, 1997).

Counter to this, the marginalization perspective argues that development-related processes marginalize women primarily by diminishing their productive roles (Oropesa, 1997). Chow (2003) argues that women disproportionately bear the burden of globalization. The costs of globalization include the feminization of labor, particularly in segregated and low-paying work, wage dependency, labor exploitation, economic marginalization, poverty, sex tourism, and international human trafficking of women and young girls. Scott (1986) summarizes the marginalization thesis as follows:

Women's marginalization is a product of the capitalist organization of production and use of labor. The basic elements in this are: the separation between production and reproduction, the hierarchical structure of capitalist enterprises, the rise of surplus labour and the industrial reserve

army, and the ‘mutual accommodation’ between capitalism and patriarchy which results in women’s confinement to the home, to inferior jobs and to the reserve army of labor.” (p. 651)

Chow (2003) adds that globalization tends to convert what were formally public issues, such as the care of the elderly and the young, into private issues. Women have traditionally been responsible for child care and domestic duties. Globalization has increased the rate at which women work for wages. This increase, coupled with women’s traditional domestic responsibilities, has magnified the burden of domestic and child care duties. Several other writers criticize the traditional “Women in Development” approach and argue that development tends to marginalize women (Koczberski, 1998; Patel, 1999; Simmon, 1997; Ward & Pyle, 2000).

Challenges in Measuring the Status of Women

As presented in the previous discussion, the impact of development on women is still under debate. Along with describing the relationship between development and female status, this debate has also been reflected in the way women’s status is measured. The conceptual focus of measuring the status of women, and the types of measures available to assess women’s status, have been in flux. Two themes have emerged in the literature on measuring women’s status. Both mirror issues also addressed in the literature concerning the measurement of poverty.

In the last several decades there has been a shift from a narrow focus on economic deprivation to a recognition of the multiple aspects of poverty (Chant, 2003; O’Boyle, 1999; Streeten, 1998). In addition to income and consumption, factors such as health, education, social inclusion, social capital, and political rights have been considered

important indicators of deprivation¹. The conceptualization and measurement of female status have also broadened to include consideration of multiple realms of deprivation².

Literature concerning the measurement of overall poverty has addressed the use of relative, as compared to absolute, measures of poverty (O'Boyle, 1999; Streeten, 1998). The relative versus absolute debate has also played out in the literature concerning the measurement of female status. Absolute measures of female status include measures that focus exclusively on women, such as the poverty rate among women, the illiteracy rate among women, and the average income for women. Relative measures instead focus on gender inequality and examine disparities *between* men and women. One important consideration in the move to relative measures has been the conceptual importance of comparing women to a relevant comparison group, men, as opposed to marking women off as 'separate' or 'other' (Danner et al., 1999; Young et al., 1994). Several scholars argue for the use of relative measures of gender equality as opposed to absolute measures of the status of women (Danner et al., 1999; Inglehart & Norris, 2003; Mason, 1986; Young et al., 1994).

The types of measures of relative female status used in this analysis are limited by types of data available for a large number of countries at multiple levels of development. For ease of presentation the phrase "relative status of women/relative female status" will be used to refer to measures of gender inequality and female status. Further discussion of the measurement of this concept is taken up in the chapter on methods and data. The

¹ See ch.2 for a discussion of the Human Development Index, a commonly used measure of development calculated by the United Nations. The Human Development Index includes a measure of gross national income as well as measures of longevity and education.

² See ch.2 for a discussion of the Gender-related Development Index and the Gender Empowerment Measure. In addition to income differences these two measures of relative female status consider several other dimensions of the status of women and men (life span, political rights, education).

consequences of using these measures, and suggestions for alternative measures, are discussed in the final chapter.

Summary of Gender and Development

The concept of development is complex and multifaceted, and the relationship between development and the relative status of women is not yet clearly established. We address both of these issues in the current research. We empirically assess the relationship between development and the relative status of women for numerous countries at many levels of development. We also test the relationship between relative female status and the female share of offending, with relative female status as one of multiple ways development can impact crime. The next section contains a review of the literature on the relationship between development and crime overall, and development and the female share of offending in particular.

Development and Crime

A major theme in the cross-national literature on crime is the relationship between development and crime. Researchers have looked for a relationship between national development and crime. If there is a relationship, they have studied whether its direction and strength depend on the type of crime under examination. Contradictory findings in the literature have made it difficult to attain clear conclusions on the relationship between development and crime.

Some studies show that the relationship between development and crime is weak or nonexistent. In a review of quantitative cross-national crime studies, Neuman and Berger (1988) write that no studies have found that industrialization, urbanity, or

population density increase homicide rates. They also state that the evidence for a link among industrialization, urbanity or population density, and property offending is weak and inconsistent. Pratt and Godsey (2002) also fail to find a relationship between development and homicide.

According to other studies, development has differing effects on violence and property crime. Several articles conclude that it tends to lead to decreased homicide rates and increased rates of property offending (Bennett, 1991; Kick & LaFree, 1985; Krohn, 1977; Lee, 2001; Messner & Rosenfeld, 1997; Neapolitan, 1995). Ortega et al. (1992) examine the change in economic development while controlling for region and age structure, and find that the effect of gross national product is in the same direction, and is about the same size, for both theft and homicide. A consensus on the relationship between development and criminal offending has not yet been reached.

Development and Female Crime

Empirical research on the relationship between development and female crime is scarce. This section will highlight some of the major studies and their findings. We pay closer attention to the works by Steffensmeier and colleagues, and Hartnagel and colleagues, as the current research builds on these works. The basic question of whether there is a relationship between development and female crime rates is still under debate.

Much work tends to find a positive association between development and female crime, although these relationships tend to be relatively weak and inconsistent (Hartnagel, 1982; Hartnagel & Mizanuddin, 1986). Clark (1989) finds that development is positively related to proportion of female to total offenders, and that gross national product is negatively related to female murder. According to South and Messner (1986),

development is related to higher levels of female theft.

Some studies report a somewhat stronger positive relationship between development and female crime. Performing extensive bi-variate analyses, Chernoff and Simon (2000) find that the mean female rate of offending increased across the two time periods included in their analysis (1962–1980 and 1981–1992). When comparing more and less developed countries, they show that countries with the highest percentage of female offenders are those that are the most economically developed (Chernoff & Simon, 2000).

In his cross-national test of structural strain theory, Messner (1985) measures the impact of the likelihood of attaining sex specific goals (domestic goals for women and economic goals for men) on male and female homicide arrest rates. The probability of attaining domestic goals is measured as the proportion of the sex-specific population aged 45-49 who are never married, the probability of attaining economic goals is measured as the level of income inequality, assessed by the Gini coefficient. He finds that the female homicide arrest rate is significantly influenced by the proportion of never-married females and not by economic inequality, while the male homicide arrest rate is significantly influenced by economic inequality and not by proportion of never-married males. This is interpreted to indicate that the structural sources of homicide for men and women may be different. Messner (1985) also concludes that, controlling for other factors, development does not significantly impact offending by either males or females.

Much of the research on development and female crime has been driven by the liberation hypothesis. According to this hypothesis, development will bring about an equalization of male and female gender roles that will lead to more criminal motivation

and opportunities for females. The articles by Harnagel (1982) and Hartnagel and Mizanuddin (1986) test this theory by including a measure of female domestic role participation (fertility rate) and female public role participation (female labor force participation rate and index of femaleness in 3rd level of education). They find very weak and inconsistent support for this theory. There is either an inconsistent or totally absent direct impact of development on the proportion of offenders who are female. The indirect impact of development on this proportion, through female role participation, is absent or very weak. Hartnagel and Mizanuddin (1986) did find that urbanization increases the proportion of fraud arrestees that are female, fertility decreases proportion of fraud arrestees and increases the proportion of homicide arrestees who are female, and female labor force participation increases the proportion of women arrested for larceny and homicide.

Steffensmeier et al. (1989) test both the direct and indirect effects of four alternative explanations of the relationship between development and female crime. These alternative explanations will be reviewed in more detail below. Steffensmeier et al. show that the total effect of development on the female percentage of arrests is larger for minor property offending than for homicide or major property offending. About half of the effect of development on minor property offending is direct, while indirect effects function through the opportunity for consumer-based crimes. Formalization of social control also accounts for a large part of the indirect effect of development on homicide and minor property offending. The indirect effects of relative female status and female economic marginality are not substantial for any of the offense categories.

The Present Study

The present study is both a replication and extension of Steffensmeier et al. (1989) and the works of Harnagel (1982) and Hartnagel and Mizanuddin (1986). Like these earlier pieces, we provide an empirical assessment of the liberation hypothesis (Hartnagel, 1982; Hartnagel and Mizanudin, 1986; Steffensmeier et al. 1989). Moving beyond the two Hartnagel articles, and building on the Steffensmeier et al. (1989) article, we also test other explanations for the relationship between development and the female share of offending (Steffensmeier et al. 1989). In addition to assessing the impact of development on relative female status, we include measures of other changes that accompany development and may differentially impact male and female offending. The other factors that are examined are opportunity for consumer crime and the formalization of the mechanisms of social control.

We move beyond previous work by taking advantage of the existence of different and improved measures of important concepts. Several researchers suggest that development is a complicated concept and that measures of development should not be limited to strictly economic indicators (Punchamukhi, 1999; McMichael, 2000; Seers, 1979). The primary measure of development used in this research is an index. In addition to gross domestic product per capita, the index includes longevity, literacy, and enrollment ratios. While this index is the primary indicator of development, we also consider gross domestic product per capita to facilitate comparisons with the earlier works.

Another concept for which improved measures are available is formalization of the mechanisms of social control. This analysis begins by using the same measure as that

used by Steffensmeier et al (1989), the number of years a country reports crime data. However, we also consider several alternative measures including the clearance rate and an index of criminal justice effectiveness.

This research also provides a more extensive consideration of the concept of relative female status than previous works. We include an assessment of several different aspects of female status. In addition to gender differences in education and employment, the measures used in previous studies, we also include measures of illiteracy, political participation, and family formation. We also consider both individual measures as well as composite indicators of relative female status. Taking advantage of the improved measures of female status that are available today, this project is able to more thoroughly explore the question of the relationship between relative female status and the female share of offending.

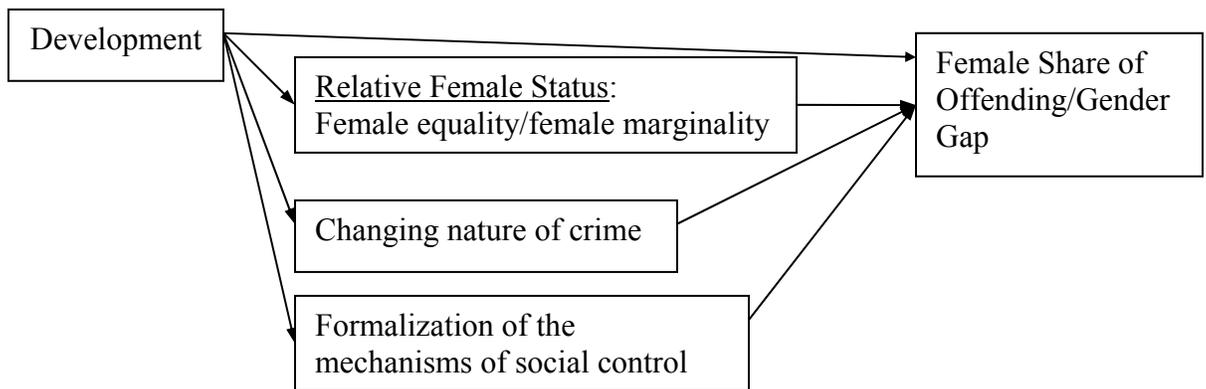
The present study also considers a different time frame than previous works. Both Hartnagel articles (1982 and 1989) and the Steffensmeier et al. article (1989) examine the female share of offending in the 1970's. The current project assesses the female share of offending at the end of the 1990's (1997 – 1999). It updates the earlier works by including data up to 1999 for a more current examination of the relationship between developmental status and the female share of offending. It is important to examine this relationship in a more recent time frame to understand whether the relationship between development and the female share of offending is the same now as it was in previous decades.

Explanations for the Relationship between Development and Female Crime

Drawing on the work of Steffensmeier and colleagues (1989), there are several alternative explanations for the relationship between development and female crime. The descriptive model in Figure 1 lays out the major framework for this study.

The causal pathways for the impact of development on the female share of offending/gender gap vary depending upon which of the alternative explanations is considered. The model proposes three potential mediators of the effects of development

Figure 1. Descriptive Model



on crime: relative status of women, changing nature of crime, and the formalization of social control. For the gender gap in offending to change, these factors would need to impact males and females differently. If their impact did not vary by sex, we would expect them to lead to similar increases or decreases in both male and female rates of offending, and thus no change in the gender gap. The model also allows for some remaining direct effects of development on the female share of offending. We consider each of the paths in turn.

Relative Female Status

Liberation Hypothesis/Female Equality

One explanation of the impact of development on the status of women is the liberation hypothesis. This concept received a great deal of attention in earlier writings (Bonger, 1916; Gault, 1932; Hurwitz, 1952; Parmelee, 1918; Pollak, 1961; Sutherland, 1960) but in the 1970s the liberation hypothesis garnered a great deal of attention as a way to explain the supposed increase in the rate of female offending (Adler, 1975, 1977; Simon, 1975). This hypothesis suggests that with development comes an equalization of gender roles and greater freedom for women. An equalization of gender roles, in turn, leads to increased criminal motivation and opportunity for females. Adler (1975 and 1977) and Simon (1975) suggest somewhat different variations on this same theme.

Adler (1975) argues that increases in women's status lessen social and psychological differences between men and women. She writes that women have the same aspirations as men, but that more traditional gender norms limit the options available to women to achieve them. Under circumstances of limited options, women resort to petty crimes and indirect ploys. She suggests that the women's movement, and the accompanying changes in gender norms and expectations, would change the options available to women. The rise in female status associated with the women's movement would lead to an opening up of more options for women, both legitimate and illegitimate. Adler (1975) proposes that the frequency of women's offending would increase with this changing status of women. She also suggests that the nature of women's criminal offending would come to resemble that of men, in that women would become involved in more lucrative forms of property offending and more violent types of offending.

Simon (1975) suggests a very similar process whereby female rates of offending increase as a result of the changing status of women. Simon focuses more on the role of increased opportunities and 'expanded consciousness' that accompany an increasing status of women. "As a function both of expanded consciousness, as well as occupational opportunities, women's participation, roles, and involvement in crime are expected to change and increase" (Simon, 1975, p. 2). One point of departure for Simon is that, contrary to Adler (1975), she suggests that female rates of violence would decrease with rising female status. She argues that with their increasing status, women's feelings of victimization and exploitation will decrease, and their motivation for and commission of violent offending will also decrease.

We draw from these statements of the liberation hypothesis in our consideration of the relationship between relative female status and female crime. Several changes that may accompany an equalization of gender roles could lead to a growth in female, relative to male, crime and a narrowing of the gender gap. Greater numbers of women in the economic sphere means increased access to opportunities for white-collar crime and employee theft. Opportunities for these types of offending were previously less available to women because of their restriction to the domestic sphere. These factors could lead to an increase in rates of female, relative to male offending, and result in a decrease in the gender gap in offending.

The usefulness of the liberation hypothesis in explaining the relationship between development and the female share of offending rests on several factors. Development is assumed to be related to an increase in female status. As described above, the relationship between development and female status is contentious; this research will

contribute to fleshing out some of these contingencies. Also, the liberation hypothesis predicts that female crime will increase with increasing gender equality.

However, several writers have criticized this hypothesis as being simplistic (Box & Hale, 1984; Steffensmeier, 1980; Steffensmeier & Allan, 1996; Steffensmeier et al., 1989). Steffensmeier et al. (1989) summarize these critiques as follows: “Both female roles and crime should be seen as outcomes of complex socioeconomic, political, and historical factors, and that factors – other than gender equality- associated with development may help explain cross-national variation in proportionate female criminality” (p. 263). Taking into account these critiques and building on the work of others who have included alternative causal factors, we also explore alternative explanations for the relationship between development and the female share of offending.

Female Economic Marginalization

Another explanation of the relationship between development and crime suggests that development will lead to increased economic vulnerability for females and growing inequality between men and women. This explanation is in line with the marginalization perspective on women and development, in their common assumption that females are marginalized by development-related processes (Chow, 2003; Koczberski, 1998; Patel, 1999; Simmon, 1997; Ward & Pyle, 2000). Female economic vulnerability can come from several factors that accompany development. Structural factors associated with income inequality between men and women include segregation of females into low-status and low-wage jobs, and the resulting unequal income distribution between men and women. Increased rates of divorce, illegitimacy, and father-absent households also lead to a loss of income for women. Another factor that accompanies development and

increases female economic marginality is the breakdown in the safety net of traditional family and kinship bonds.

All of these factors that contribute to increased economic marginality for females increase stress and strain for females and lead to increased pressure to commit traditionally female consumer-based offending. This perspective suggests that, in comparison to males, females are particularly marginalized by changes that accompany development. For this reason female rates of offending will increase in comparison to male rates, and the gender gap in offending will decrease.

Changing Nature of Crime

This explanation is based on the idea that development is accompanied by changing opportunities for certain types of crime, and that these changes may lead to crime opportunities that are more available or attractive to one sex than the other. The changes that accompany development and impact opportunity for crime include an increased supply of goods and self-service marketing, a credit-based economy, consumerism, and the growth of the social-welfare state. These changes have resulted in increased opportunities for theft and fraud for both sexes, but especially for females. These changing opportunities may impact female offending more greatly than male offending because minor property offenses like shoplifting, check forgery, and credit card fraud comprise a larger part of all female than of all male crime (Steffensmeier, 1993).

This change in the type of criminal opportunity that accompanies development can be expected to differentially impact male and female rates of offending. This idea builds on Steffensmeier's (1983) and Steffensmeier and Terry's (Steffensmeier & Terry,

1986) gendered opportunity perspective. They suggest that women's illegitimate opportunities are restricted by their limited selection and recruitment into criminal groups. Because women do not have full access to criminal groups, they have restricted access to the advantages (tutelage, skill, criminal networks) enjoyed by members of these groups. This limited opportunity helps to explain the types of crimes more likely to be committed by women: "Like male offenders, female offenders gravitate to those activities which are easily available, are within their skills, provide a satisfactory return, and carry the fewest risks" (Steffensmeier & Terry, 1986. p.321).

The gendered nature of criminal opportunity, and resulting tendency of males and females to commit different types of offenses, is borne out in criminal statistics. A higher proportion of female than male crime involves minor theft and fraud (Steffensmeier, 1993). Males do also engage in such crimes in high numbers, but theft and fraud represent a smaller proportion of all male, than of all female crime. Because development is associated with increased opportunities for the types of crime that involve a higher proportion of females, development could lead to an increase in the female share of offending for these types of crime (theft and fraud) and a narrowing of the gender gap.

Formalization of the Mechanisms of Social Control

Another change associated with development is the increased formalization and professionalism of criminal justice systems (Clinard & Abbot, 1973). This formalization of the mechanisms of social control could differentially impact female and male rates of arrest, and thus the female share of offending, for several reasons. First, developed countries are more likely to have institutional facilities to house female prisoners, reducing the reluctance of police officers to arrest females. Also, more formalized

record-keeping procedures lead to more accurate recording of sex of the offender and a decreased tendency to assume offenders with “unknown” sex are automatically male.

Several factors may lead to an underreporting of female crime, or the more lenient treatment of female offenders, in less developed compared to more developed countries. Less serious crimes, which are more typical of female than male offenders, are more likely to be handled formally in more highly developed countries. In more developed countries women are more likely to be held criminally liable for their offending, as opposed to less developed countries where women may continue to be legally dependent on their male relatives. Also, for political reasons, there may be systematic underreporting of even serious female crime in some developing countries.

All of these factors contribute to increased visibility of female crime in more highly developed countries. Greater formalization will lead to a greater portion of both minor and serious criminal offenses coming to the attention of police agencies and being recorded in official statistics. In comparison to males, a greater proportion of female offenders commit less serious offenses (Steffensmeier, 1993).

As a result, the policy of dipping more deeply into the pool of offenders will have a greater effect on levels of reported crime for females than males. These changes that accompany development lead to an appearance of growth in the rate of arrests for females relative to males, and a narrowing of the gender gap. However, changing arrest rates may be reflecting changes in the criminal justice system more than changes in offending behavior.

Alternative Possibilities

All of the above explanations assume that development will differentially impact

the lives of men and women and thus lead to changes in the gender gap in offending. It is possible that development could have a relatively similar impact on the lives of men and women, meaning that it would not disproportionately impact the offending rates of either group. Male and female rates of crime would rise and fall in tandem, and the gender gap would remain stable.

Another possibility is that the female share of offending might be the same, or even smaller, in more highly developed countries. Following from the modernization perspective on gender and development, women could benefit from development-related processes (Horton, 1999; Oropesa, 1997). Several of these explanations are suggested in Steffensmeier et al. (1989). Development and an equalization in gender roles might enhance the psychological well-being of females and provide them with alternative sources of gratification. More equal participation in all aspects of social life may reduce stress, raise self-esteem, and reduce the female rate of offending. The opportunities for paid employment for women may reduce criminal motivation, lessen dependency on men and connections to possibly criminal males, and provide alternatives to illegitimate work. New roles in the world of work may not be accompanied by a reduction in duties at home and in child care, leaving women in more developed countries less time for criminal activity.

Formalization of social control may decrease female, relative to male, levels of offending, in that it has been suggested that females are more susceptible to deterrence by criminal justice sanctions (Steffensmeier, 1983). If in more highly developed countries females are dealt with more formally and are more likely to be held responsible for their actions, they may also be more deterred from crime, thereby decreasing female relative to

male crime and increasing the gender gap.

Variation by Crime Type

Much of the literature on the relationship between development and overall crime, as well as that on the relationship between development and female crime, reports differences by crime type. Some of the development literature reveals a decrease in violent crime with development for both men and women. The explanation suggesting that development-related factors could impact the amount of strain experienced by females (female economic marginality) could also be interpreted as leading to an *increase* in the female share of violent offending. However, Steffensmeier et al. (1989) find that their models do not explain much of the variance in the female share of offending for homicide ($r^2 = .11$) or major property offending ($r^2=.10$).

The relationship between development and property crime is also mixed. Some studies find that more developed countries have higher rates of property offending and others find no association between development and property crime. The model employed by Steffensmeier et al. (1989) works best for explaining variation in the female share of offending for minor property crime. We will explore the effectiveness of our models in explaining the female percentage of arrests for different types of offending.

Summary

Development can influence the female share of offending in offending in numerous ways. In addition to its impact on relative female status, development may have effects through its impact on criminal opportunities and the formalization of social control. In the next chapter we describe the data sources and methodology used to

explore these issues. Then, in the following two chapters, we present the empirical evidence according to the following set of research questions:

- 1) What are the effects of development on female crime and the gender gap?
- 2) To what extent are the effects of development on the female share of arrests explained by changes in the relative status of women, opportunity for consumer crime, and formalization of the mechanisms of social control?

Chapter 2

Methodology

This chapter presents the methodology and critically assesses the data sources used to explore the relationship among national development, male and female crime rates, and the female share of offending. First, we review the benefits and challenges of taking a cross-national approach. Then we describe Interpol data, the primary source for the dependent variable. Research on Interpol data is presented, issues of data quality (including missing data) are assessed, and criteria for including countries in the project's final analysis are established. Next, we describe the data sources and measures for independent and control variables in this research. In an effort to establish the usefulness of Interpol data for addressing these questions, a comparison of the "Study sample" cases and the "excluded" cases is undertaken. This is followed by an explanation of the analytic techniques applied to assess the effects of development and the mediating variables on male and female crime rates and the female share of offending. These techniques include Ordinary Least Squares regression and the Clogg test of mediation.

Data and Measures

This project assesses the impact of development on male and female crime rates and the female share of offending and thus requires ecological rather than individual-level data. Development, the primary explanatory factor being examined, is conceived of as a characteristic of nations, necessitating the adoption of nations as the units of analysis. The starting point for our analysis, then, is the 130 nations that reported crime data to Interpol between the years 1997 and 1999. Upon subsequent evaluation of missing data

and other data quality issues, this sample size is reduced to roughly 50 countries.

Description of Interpol Data

Data for measuring male and female crime rates and the female share of offending are drawn from Interpol statistics. Interpol (International Criminal Police Organization) is an international police organization that was established in 1923. As of 2005, it had 182 member countries (Interpol, 2005). Since 1950, it has collected crime statistics from its member countries and published them annually in *International Crime Statistics*. Crime figures are based on police and judicial statistics provided by each member country in response to a standardized form with instructions provided in four languages.

The Interpol database contains information in two categories: “volume of crime” and “persons responsible for offenses”. In the “volume of crime” category countries provide figures on the number of crimes known to the police, the percent of crimes known to the police that are attempts, and the percent of crimes known to the police that are solved. We refer to these figures as “offenses known to the police”. In the “persons responsible” category countries report information on persons identified as penal offenders by the police. Interpol instructions specify that these statistics should not refer only to persons convicted (Interpol, 1985). We refer to statistics drawn from the “persons responsible” category as arrest figures. The total number of arrestees, the percent of total arrestees who are female, the percent of total arrestees who are juvenile³, and the percent of total arrestees who are not citizens of the reporting country are included in this category. Both “offenses known” and “arrest” figures are provided for several different offense categories, with Interpol providing standardized definitions of each category.

³ Interpol asks each country to report the age range of its definition of juveniles. Since this age range varies, this category is not directly comparable across countries.

Definitions of the crime categories included in this study appear in Table 2.1. Homicide is defined as “any act performed with the purpose of taking human life, in whatever circumstance” (International Criminal Police Organization, 1999, introduction). Abortion is not counted in homicide figures; infanticide is. This is important to note because literature on female homicide in the United States finds that compared to men, when women commit homicide their victims are more likely to be family members (Jurik, 1990; Kruttschnitt, 2001). The inclusion of infanticide provides a more accurate assessment of female homicide rates. Interpol distinguishes between two main types of theft⁴: aggravated theft, defined as theft with “dangerous or aggravating circumstances”; and theft that is referred to here as “theft”. Because the definition of “aggravated theft” closely resembles what is traditionally considered robbery, the “aggravated theft” category will be referred to as “robbery” for the remainder of this project. Fraud is a related offense category that involves other means of gaining unlawful possession of another’s property. The “total” category includes all offenses detected by the police and is more than just the sum of the above-described offense categories.

Many of the limitations associated with Interpol data are common to all official sources of crime data, although the international scope of the Interpol data set also creates some additional issues. Challenges associated with official crime statistics in the United States have been extensively reviewed (Biderman & Lynch, 1991; Gove et al., 1986;

⁴ In 1977 several changes were made to the way in which Interpol data were collected and reported. The major change was the disaggregation of the theft category into its component parts (aggravated theft, auto theft, and other theft). However, not all countries report auto theft separately and instead include it in the aggravated theft or other theft category. Countries were asked to report on how this issue was handled, however, only about 20% of cases (a case is a country-year) did so. Of the cases that did mention how auto theft was categorized, about 24% reported that it was included in aggravated theft and 60% reported that it was included in “other theft”. Since so little information is available on this issue, the categories were left as they were reported and we proceed with the knowledge that there is some between-country inconsistency in this category.

Steffensmeier, 1983, 1993) and researchers have concluded that the data are appropriate when used with caution. Several scholars have also critically assessed Interpol data. This literature is reviewed below (Archer & Gartner, 1984; Bennett, 1987; Bennett & Lynch, 1990; Howard et al., 2000; Huang, 1989; Lynch, 1995; Vigderhous, 1978).

Underestimation of crime is a problem common to all official crime statistics. Since all official statistics, including Interpol data, come from police and judicial figures, they are limited to crimes that are known to police. The challenges associated with this data limitation are as follows. (1) Many crimes are not reported and do not come to the attention of the police. (2) The focus of official crime figures tends to be on street crime, while white collar crime receives very little attention. (3) Information on criminal events is filtered through victim reporting and police recording processes.

Comparisons of official statistics and victimization surveys in the United States have determined that perceived seriousness is the prime determinant of whether a crime is reported to the police. Therefore, official figures on more serious types of offending, such as homicide and robbery, are the most reliably measured (Biderman & Lynch, 1991; Gove et al., 1986; Steffensmeier, 1983). Archer and Gardner (1984) report that studies of the few cross-national victimization surveys that exist suggest that underreporting also occurs in other societies, and that it is similarly patterned with less underreporting for more serious offenses. This leads to the contention that, similar to data in the U.S., cross-national figures on more serious types of offending are more reliably measured. However, research has consistently documented that the female share of offending tends to be greater in less serious and violent forms of offending (Simon & Ahn-Redding, 2005; Steffensmeier, 1993; Steffensmeier & Allan, 2000). Thus, limiting the analysis to

only serious types of offending would miss the types of crimes that women commit at higher levels and that also display a greater degree of variation in the female share of offending. For these reasons, less serious forms of offending are included but results are interpreted with caution and an awareness of data limitations.

Several issues related to organizational variation in police departments can also impact the reliability and validity of official statistics. These issues include: differences across countries in the ability of police departments to collect crime data, differences in police decision-making, and differences in the recording of data. Broadly classified, these can be referred to as differences in the formalization of the mechanisms of social control. A variable measuring the formalization of the mechanisms of social control is included to help account for cross-national variation in these factors. Details on this measure appear in the section below on independent and control variables.

Another concern that is common to all official crime data, including Interpol data, is the definition of crime categories. Official crime statistics use broad crime categories that can include a great deal of variation in the types of behaviors classified together. Additionally, definitions of crime and criminal statutes can vary substantially across countries. Interpol addresses this issue by creating crime categories, providing definitions for those categories, and asking reporting countries to categorize their offense data accordingly.

An issue that relates more uniquely to Interpol data has to do with generalizability. The sample of countries included in Interpol data is not randomly selected and relies on member countries reporting. However, approximately 100 countries report figures to Interpol annually (Bennett, 1987), the countries come from all

seven regions of the world, and they represent many levels of development. Among the countries that report figures, there is a sizable portion of missing data. The following section presents extensive analyses to assess the extent of the missing data and other data quality issues in an effort to assess the feasibility of using Interpol data to address the proposed research questions.

Several researchers have performed analyses of Interpol data and have also compared Interpol data to other international crime data sets. While acknowledging the limitations of Interpol data, researchers have concluded that they are appropriate when used with caution (Bennett, 1987; Bennett & Lynch, 1990; Huang, 1989; O'brien 1995; Steffensmeier et al. 1999, Vigderhous, 1978). Based on their 1990 study comparing several international crime indicators of theft and homicide, Bennett and Lynch (1990) conclude:

These findings are of particular import for the use of INTERPOL data which have been criticized as grossly unreliable. They indicate that such criticisms may not be warranted. Differences among the Comparative Crime Data File, the United Nations crime survey, the World Health Organization, and INTERPOL data sets, for aggregate descriptive or analytic analyses, are differences that do not make a substantive difference. (p.177)

We acknowledge the challenges associated with Interpol data, many of which are common to all official sources of crime data, and describe below our use of Interpol data to operationalize our dependent variable—female share of arrests.

Measuring the Female Share of Offending

The primary dependent variable is the female percentage of arrests (FPA). The calculation of the FPA begins with sex-specific arrest rates. These rates are calculated by

dividing the number of male arrestees by the male population⁵ and multiplying this figure by 100,000 and doing the same for the female figures. The female percentage of arrests is calculated by dividing the female arrest rate by the sum of the male and female arrest rates and multiplying this figure by 100. This figure is a well established measure of the female share of arrests and was developed by Steffensmeier and colleagues (see Steffensmeier, 1980). The average FPA across the years 1997 – 1999 is calculated to control for short-term fluctuations.

$$\left(\frac{\text{Female Rate}}{\text{Male Rate} + \text{Female Rate}} \right) \times 100 = \text{Female Percentage of Arrests}$$

This figure expresses the percentage of all arrestees that are female while controlling for the sex distribution of the population.

An important advantage to using this gender-gap measure relates to its use of sex-specific population figures. The female percentage of arrests takes into consideration the sex ratio of the population by using sex-specific population figures to calculate male and female arrest rates. The sex ratio can vary substantially cross-nationally so accounting for this difference is essential (Deane, 1987). The FPA is calculated for total crime (the sum of all offenses known to the police) and for each of the following crime categories: homicide, robbery, theft, and fraud.

We have reviewed the documented strengths and weaknesses of Interpol data and described the measure of the female share of offending. Next, we begin a detailed assessment of the steps used in selecting the final samples to be included in the analysis.

⁵ The population figures used include individuals aged 15 and above since individuals under the age of 15 who come in contact with the police are not likely to be arrested. The population aged 15 and above provides a better estimation of the population “at risk” for arrest than using population figures for all ages.

Description of the Initial Data Set

In 1998 (the middle year of the 1997 – 1999 period included) there were 177 member countries in Interpol (Interpol, 1998). Of these, 130 (73%) report at least some offense data for the years 1997 through 1999. Table 2.2 lists the countries that do not report any crime data, and Table 2.3 lists countries that do present at least some data for the offenses considered in this analysis. Considering the 130 countries that do report offense data, Tables 2.4 and 2.5 display their distribution with regard to level of development and region. The 54 countries at the medium level of development account for the largest proportion of the sample at 41.5%, followed by the 38 high development countries representing 29.2%. Low development countries account for the smallest proportion of the sample—15 countries or 11.5%⁶. The group of countries in the regions of North America, Europe, and Oceania represent the largest proportion of countries in the sample with 47 countries accounting for 36.2% of the sample, followed by Asia with 37 countries accounting for 28.5%, Latin America with 24 countries representing 18.5%, and Africa with 22 countries representing 16.9% of the data set. Now that a baseline description of Interpol data has been established, questions about data quality are addressed.

Criteria for Inclusion in Analysis

Given the extent of the challenges associated with using Interpol data, a set of three criteria is used to aid in deciding which countries to include in multivariate analysis. Each of these criteria is applied separately for each offense. This results in differences in the size and composition of samples for each offense category. The three criteria are:

⁶ The United Nations does not report a value for the Human Development Index for 23 countries, 17.7% of the sample.

- (1) Number of years a country reports data
- (2) Value of the average female share of offending
- (3) Change in the female share of offending across the 1997 – 1999 time period

Criterion 1: Number of Years of Data Reported

The first criterion, number of years data are reported, addresses the problem of missing data. Because an analysis based on only one year of data may be subject to short-term fluctuations, in order to be included in analysis at least two out of three years of data for the 1997 – 1999 time period must be reported. Not all countries report the same number of years of data for all crime types. For example, a country may report three years of data for homicide arrests but only one year of data for theft. If this were the case that country would be included in the analyses of homicide but excluded in the analyses of theft.

Countries voluntarily report data to Interpol and the consistency with which they do so varies by several factors including the measure of offending being considered (offenses known versus arrest), the reporting country's level of development, and the offense type. Table 2.6 refers to the "total crime category" (all types of offending combined) and shows the number of years reported between 1997 and 1999 for three different measures of offending: offenses known to the police, arrests, and sex-specific arrests. These figures are presented for all countries as well as separately for low, medium, and high development countries. Using the criteria of reporting at least two of the three years of data, we find: 32.4% of countries do not report a sufficient number of years of data to be included in analyses of offenses known, 43.9% for arrest, and 50.7% for sex-specific arrest.

The percentage of countries that report less than two years of data also varies by level of development. For all three types of offense indicators (offenses known, arrest, and sex-specific arrest), countries at higher levels of development have less missing data (see Tables 2.6). Correlations between the number of years a country reports data and their level of development range from $r = .22$ to $r = .36$, depending on offense type, again demonstrating that countries at higher levels of development report more years of data. (These figures are reported in Table 2.7.)

The number of years reported also varies by the type of crime being considered. Since sex-specific arrests are the source for the primary dependent variable, they will be the focus of the remaining analysis (see Table 2.8). Homicide is the offense category that has the least missing data for sex-specific arrests, with 48.4% reporting less than two years of data. This is followed by fraud (51.5%), theft (54.6%), and robbery (58.4%). Again, across all offense types, countries at higher levels of development report less missing data.

This section presented the proportion of data that is missing and demonstrated that the proportion of data missing varies by several factors. Sex-specific arrest statistics have the largest proportion of missing data, followed by non-gender-disaggregated arrest statistics and the offenses known statistics. Countries at higher levels of development have less missing data than countries at lower levels of development. Regarding type of offense, homicide has the least missing data and robbery the most. While these proportions are substantial, the sample size for the initial data set is large ($N = 130$). Additionally, a quantitative comparison of the cases that meet the data quality criteria and the cases that are excluded is reported. This allows us to establish the extent to which the

excluded cases differ and how this could impact on the generalizability and validity of findings.

Criterion 2: Value of the Average Female Share of Offending

In addition to the number of years of data reported, two other criteria were used to establish whether a particular country would be included in analysis. The second criterion deals with *outliers* and involves the range in the female percentage of arrests across countries. Qualification on this factor is established by visually inspecting a scatter plot and examining values for FPA. Data points that are particularly high or low, such as a female percentage of arrests for homicide above 20, are not included. These cases are excluded because they are likely either artifacts of reporting or recording inconsistency or error, or because they fall so far outside of the range of other scores that they could obscure patterns and strongly influence findings. Table 2.9 lists the countries excluded based on this criterion.

Criterion 3: Change in the Female Share of Offending across the Years 1997 – 1999

The third criterion, *change in FPA*, is established by examining the female percentage of arrests in 1997, 1998, and 1999. For example, Singapore reported in 1998 an FPA for homicide of 5.3% as compared to an FPA of 21.3% in 1999. Singapore is excluded from the analysis of homicide figures based on this criterion. Cases that show a large fluctuation in this short time span are excluded for the same reasons described above for criterion 2. Table 2.10 lists the countries excluded based on this criterion.

Each of these criteria is applied to figures for each of the offense types, resulting in a different composition and sample size for each type of offense. Table 2.11 reports

the number of countries that meet each of the three criteria individually as well as the number that meet all three criteria. Countries that meet all three criteria are referred to as “Study sample” cases; those that do not meet all three criteria are referred to as “excluded” cases. Total offenses is the category that includes the largest number of countries, 61, followed in descending order by fraud (57), homicide (55), theft (49), and robbery (46).

Measures of Independent and Control Variables

Table 2.12 displays the mean values for the independent and control variables for all countries that report offense data to the Interpol. Data for the independent and control variables used in the analysis are taken from a variety of sources, including the United Nations, the International Labor Office, and the World Bank. This section describes the sources and the measures, beginning with the key concept of “development”.

Development is a complex and multifaceted concept whose meaning is still under debate. McMichael (2000) suggests that development is a master concept that signifies a goal of a rising standard of living. There are two main approaches to measuring development. Many studies use the gross domestic product per capita as an indicator of development. Though this measure is a good approximation of the economic aspect of development, it does not take into consideration other aspects such as education, health, and participation in government. An alternative measure, the Human Development Index (HDI), has been developed to address these shortfalls. “While the concept of human development is much broader than any single composite index can measure, the HDI offers a powerful alternative to income as a summary measure of human well-being” (Fukada-Parr, 2004, p.137).

The Human Development Index is a composite index that is used to measure a country's average achievement in three dimensions of human development. These dimensions include: life expectancy at birth; adult literacy rate, gross enrollment for primary, secondary and tertiary schools, and gross domestic product per capita (Fukada-Parr, 2004). For each dimension an index is calculated with values falling between 0 and 1. An average of each of these dimensions is then calculated to compute the Human Development Index score. The mean score on the Human Development Index is .72 for all countries that report crime data. The HDI score from 1995 is used in this analysis (see Table 2.15 for descriptive statistics).

Relative Status of Women is another key concept in this research. There is a vast and diverse literature concerning the definition and measurement of the status of women. Multi-dimensional indexes are commonly used to assess relative female status because they include several different indicators of the concept. The United Nations calculates two indexes that capture different aspects of relative female status: the *Gender-related Development Index* (GDI) and the *Gender Empowerment Measure* (GEM) (Haq, 1995).

The Gender-related Development Index uses the same measures as the Human Development Index but adjusts downward for inequality in achievement between men and women⁷. The GDI ranges in value from 0 to 1 with 1 indicating perfect gender equality. Considering all countries that report crime data to Interpol, the mean value for GDI is .65 (target year 1995).

The Gender Empowerment Measure looks at gender disparities across three broad classes of variables: (1) power over economic resources, (2) access to professional

⁷ See the 2004 Human Development Report for details on calculation of the Gender-related development index (Fukada-Parr, 2004).

opportunities and participation in economic decision-making, and (3) access to political opportunities and decision-making. Power over economic resources is measured by women's and men's estimated earned income. Access to professional opportunities and economic decision-making is measured as women's and men's percentage share of positions as legislators, senior officials, and managers, and women's and men's percentage share of professional and technical positions. Political power and decision-making is measured as women's and men's percentage share of parliamentary seats. For each dimension a population-weighted average is calculated and the Gender Empowerment Measure score is computed as an average of these figures⁸. The Gender Empowerment Measure ranges from 0 to 1, with 1 indicating perfect gender equality. The mean value of the GEM in the sample, including all countries that report data to Interpol, is .40 (using 1995 as our target year).

Considering all countries that report crime data, correlations between the Human Development Index and both the Gender-related Development Index ($r = .97$) and the Gender Empowerment Measure ($r = .70$) are positive and large. These correlations indicate that half of the variation between development and the Gender Empowerment Measure is shared, and that there is about 94% shared variation between the GDI and development. Including these measures of relative female status with the Human Development Index in multiple regression analyses would not be feasible because of multicollinearity. An alternative indicator of the relative status of women that is empirically distinct from the measure of development is substituted. This measure is called the Relative Female Status Index and is described below.

⁸ See the 2004 Human Development Report for details on calculation of the Gender Empowerment Measure (Fukada-Parr, 2004).

Young et al. (1994) analyze a large set of indicators of relative female status. The alternate Relative Female Status Index pulls from these indicators. The index includes the following measures: number of females per 100 males enrolled in primary school and secondary school, number of female teachers per 100 male secondary school teachers, and number of economically active women per 100 economically active men in the industry and service sectors. The economically active population is defined as all persons who furnish the supply of labor for the production of economic goods and services. The industrial sector covers mining and quarrying (including oil production), manufacturing, electricity, gas and water, and construction. The service sector covers wholesale and retail trade, restaurants and hotels, transport, storage and communication, financing, insurance, real estate and business services, community, and social and personal services (including public administration and defense).

All of the figures included in the Relative Female Status Index are drawn from the United Nations Women's Statistics and Indicators (WISTAT) database (United Nations, 1999), which compiles international statistics from numerous sources⁹. Figures for these measures were taken in the mid to late 1990s. To create the Relative Female Status Index, each of these measures is standardized and the average of these five standardized scores is calculated. The Relative Female Status Index ranges from -1.95 to 1.25 with a mean value of .14. A higher score on the Gender Equality Index indicates a higher status of women. The alpha reliability of the scale is .69 and the correlation with development is $r = .65$, which is low enough to allow inclusion of this variable in multivariate analyses with the Human Development Index. Given that relative female status is a key concept in

⁹ Statistics drawn from the WISTAT database that were included in the Relative Female Status Index come from the United Nations Education Statistics database and Statistical Yearbook and the International Labor Office.

this research, to more fully explore the impact of the relative status of women on the female percentage of arrests we will include several alternative indicators of relative female status in the final analysis.

Indicators for *opportunity for consumer crime* and *formalization of the mechanisms of social control* are borrowed from Steffensmeier et al. (1989). Opportunity for consumer crime is measured as the number of radios per 1,000 population in 1995. This figure is drawn from the United Nations WISTAT database. Steffensmeier and colleagues (1989) state that this indicator reflects “the availability of the types of products or commodities that are prone to theft and have a mass-marketing dimension which encourages a variety of consumer crimes. (It is not assumed that females steal radios per se)” (p. 268). The mean number of radios per 1,000 in 1995 is 446 for all countries that report data to Interpol.

Formalization of the mechanisms of social control is measured as the number of years a country submits male and female arrest rates to Interpol between 1985 and 1999. The consistency with which a country reports data to Interpol is taken to reflect the level of institutionalization and professionalism in its criminal justice system. Considering all countries that report data to Interpol, the mean number of years a country reports data between 1985 and 1999 is approximately seven.

Income inequality and age are two concepts that have been linked to macro-level crime rates. Countries with a higher levels of income inequality and those with a larger percentage of a young population tend to have higher crime rates (Avison & Loring, 1986; Bennett, 1991; Butchart & Engstrom, 2002; Hsieh & Pugh, 1993; Kick & LaFree, 1985; Messner, 1989; Neuman & Berger, 1988; Ortega et al., 1992; Pratt & Godsey,

2002). The Gini index is used to measure inequality in income distribution. The Gini index measures the extent to which income distribution deviates from a perfectly equal distribution. A value of zero represents perfect equality and a value of 100 indicates perfect inequality. While not without some weaknesses, the Gini index is the most highly regarded and best-known measure of inequality (Allison, 1978; Moran, 2003). Data for the Gini index are drawn from the 2004 Human Development Report (Fukada-Parr, 2004), the Deininger and Squire database (Deininger & Squire, n.d.) and the World Bank's online database (The World Bank Group, n.d.). The mean value for the Gini index for all countries that report crime data to Interpol is 38.3 (target years in the mid-1990s).

Since younger people tend to commit a disproportionate amount of crime (Greenberg, 1985; Parmelee, 1918; Steffensmeier & Allan, 1988; Sutherland, 1960), countries with a larger proportion of people in the "high-crime committing" ages may have higher crime rates. To control for this factor a measure of the proportion of the population under 20 years of age is included. International population figures were drawn from the U.S. Census International Database (U.S. Census Bureau, 2005). For all countries that report data to Interpol, the mean percentage under age 20 across the years 1997 - 1999 is 38.6%¹⁰.

Comparison of Study Sample to Excluded Cases

Given the substantial proportion of missing data and the issues with data reliability and validity, it is important to establish the comparability of the study sample to the excluded cases. One-way ANOVA is used to compare mean values on predictor

¹⁰ The percent young variable was considered for multivariate analysis, however, subsequent analysis indicate that it is too highly correlated with development to include it in multivariate analysis.

variables and the female share of arrests for each offense. For each offense category, Tables 2.13 through 2.17 show the sample size, mean, standard deviation, and the F value from the comparison of means between the study sample and the excluded cases.

The study sample differs from excluded cases in a fairly regular way across offenses. In all cases, the study sample has a higher mean on the measure of formalization of the mechanisms social control. Recall that this measure is composed of the number of years between 1985 and 1999 that a country reports male and female arrest data. Since a minimum of two out of three years of data is required for inclusion in the sample, it is expected that the study sample would have a higher mean number of years reported than those cases that are excluded.

Across all offenses the study sample has a higher mean score on development than the excluded cases. The mean HDI for study sample is between .10 and .04 higher than the mean HDI for the excluded cases. The F value for comparing means on development is large and statistically significant for all offenses except homicide. Differences on the Relative Female Status Index are not statistically significant for any of the offenses.

Differences between the study samples and excluded cases on the mean values for control variables are also common. The study sample has a smaller mean percentage young than the excluded cases for all offenses. Across offense types, the study sample averaged 34.7% of the population under 20 years of age and the excluded cases averaged 41.5% of the population under 20 years of age. The F values comparing these means were statistically significant for all offense types. Differences between the study sample and the excluded cases on the Gini index were more moderate (they reach statistical

significance only for total crime and homicide), although the study sample consistently demonstrated a lower score, meaning study sample have less income inequality than the excluded cases.

Turning now to the dependent variable, differences between the study sample and the excluded cases in the female share of arrests are negligible. For all offense types except theft, the study sample has a smaller FPA. For theft, the study sample has a larger FPA. However, these differences are very small, averaging about 1.5%. The largest difference is for theft—3.2%. None of the F tests reach statistical significance.

In sum, results from comparing the study sample to the excluded cases show that the study sample tends to have a higher level of development, report more years of data, have a smaller percentage of the population who is young, and in some cases have a lower score for inequality. The study sample also has a larger number of radios per 1,000. Last, there are negligible differences between the study sample and the excluded cases in mean number of radios per 1,000, mean score on the Relative Female Status Index, and the mean percentage on female share of arrests.

Summary of Data and Measures

An extensive review of the Interpol data has revealed both strengths and weaknesses in using it to address the questions of interest in this study. Of special interest is the generalizability of the samples and the degree of variation in the variables of interest. The large proportion of data that are not reported to Interpol is of concern. Of the countries that reported data from 1997 to 1999, roughly half do not report enough years of sex-specific arrest data to be included in the analysis. Additionally, the study sample is further diminished in size by imposing restrictions on countries that report

figures that fall on either the high or low extreme in the distribution of data, or that report a large fluctuation in a short period of time. Despite these restrictions, the study sample is fairly large and include countries at all three levels of development representing all major regions of the world.

Table 2.18 displays the standardized values for the dependent and independent variables. It shows that most variables display a range of between 2.5 and 5 standard deviations. Though the sample sizes are not large by some standards (they average around 50 countries depending on type of offense), they should provide enough variation to examine the relationships of interest using multivariate analysis. Additionally, to assess the impact of the data restrictions imposed, all analysis will be performed both on the study sample and on the excluded cases.

Statistical Analysis

Ordinary Least Squares regression¹¹ is used to test the effects of development and other predictors on the female share of offending for each offense. The first model includes development as a predictor variable and the Gini index as a control variable, and is called the reduced model. Then we add the independent variables that are statistically significantly related to development. The Clogg test of mediation is employed. This is a powerful significance test for mediation, comparing the size of the coefficient for development in two models (Clogg & Petkova, 1995). We perform additional analyses to clarify further the effects of each of the predictor variables. These models will test the

¹¹ The Kolmogorov-Smirnov test compares the observed cumulative distribution function with a normal distribution. This test was performed for this study on the samples for each dependent variable. None of the tests were significant, indicating that the distributions were not significantly different from those for a normal distribution.

effect of each independent variable while controlling for the others. The models will include all of the independent variables: development, Gini index, radios per 1,000, formalization of the mechanisms of social control, and relative female status.

Summary

This chapter details the sources of data and the methods that used to examine the effects of development and the suggested mediating variables on the female share of offending. Data on independent and control variables, including development, relative status of women, formalization of the mechanisms of social control, opportunity for consumer crime, income inequality, and percentage young, come from numerous sources, including the United Nations, the International Labor Office, and the World Bank. The dependent variable, female share of arrests, is derived from sex-specific arrest rates provided by Interpol. The numerous challenges associated with cross-national comparison of crime indicators were addressed and three criteria were applied to the Interpol data to determine which countries to include in the multivariate analysis. Ordinary least squares regression techniques will be used to compare reduced and full models and to assess effects of development and the mediating variables on the female share of offending. The next chapter provides an examination of the bivariate analysis of the relationships among the predictor variables and also between predictors and the female share of offending.

Table 2.1

Definitions of Crime Categories

Murder: Any act performed with the purpose of taking human life, in whatever circumstance. This definition excludes abortion but includes infanticide.

Theft (all kinds): Any act of intentionally and unlawfully removing property belonging to another person.

Aggravated Theft: Theft with dangerous or aggravating circumstances (This category is referred to as “Robbery” in this project).

Other Theft: All other kinds of theft (This category is referred to as “Theft” in this project).

Fraud: Any act of gaining unlawful possession of another person’s property other than by theft

Total: Total number of penal offences detected by or reported to the police, as indicated by national crime statistics. This category includes all offenses detected by the police and is more than just the sum of the above described offense categories.

Table 2.2

Countries Not Reporting Any Crime Data (N = 47)

Anguilla	Gabon	Nauru
Antigua and Barbuda	Gambia, The	Nicaragua
Aruba	Guatemala	Nigeria
Botswana	Guinea-Bissau	Papua New Guinea
Burkina Faso	Guinea	Saint Lucia
Burma	Iraq	Saint Vincent and the Grenadines
Cayman Islands	Kenya	Sao Tome and Principe
Central African Republic	Kiribati	Senegal
Congo (Brazzaville)	Korea, South	Seychelles
Congo (Kinshasa)	Liechtenstein	Somalia
Costa Rica	Madagascar	Sudan
Cote d'Ivoire	Malawi	Venezuela
Cyprus	Maldives	Virgin Islands, British
Egypt	Mexico	West Indies
Eritrea	Montserrat	Zambia
France	Morocco	

Table 2.3

Countries Reporting Crime Data (N = 130)

Albania	Dominica	Libya	Rwanda
Algeria	Dominican Republic	Lithuania	Saint Kitts and Nevis
Andorra	Ecuador	Luxembourg	Saudi Arabia
Angola	El Salvador	Macau S.A.R.	Scotland
Argentina	Estonia	Macedonia	Singapore
Armenia	Ethiopia	Malaysia	Slovakia
Australia	Fiji	Mali	Slovenia
Austria	Finland	Malta	South Africa
Azerbaijan	Georgia	Mauritania	Spain
Bahamas, The	Germany	Mauritius	Sri Lanka
Bahrain	Ghana	Moldova	Swaziland
Bangladesh	Gibraltar	Monaco	Sweden
Barbados	Greece	Mongolia	Switzerland
Belarus	Grenada	Mozambique	Syria
Belgium	Guyana	Myanmar	Tanzania
Belize	Honduras	Namibia	Thailand
Benin	Hong Kong S.A.R.	Nepal	Tonga
Bermuda	Hungary	Netherlands	Trinidad and Tobago
Bolivia	Iceland	New Zealand	Tunisia
Bosnia and Herzegovina	India	Niger	Turkey
Brazil	Indonesia	Norway	Turks and Caicos Islands
Brunei	Ireland	Oman	Uganda
Bulgaria	Israel	Pakistan	Ukraine
Burundi	Italy	Panama	United Arab Emirates
Cameroon	Jamaica	Paraguay	United Kingdom
Canada	Japan	Peru	United States
Chile	Jordan	Philippines	Uruguay
China	Kazakhstan	Poland	Uzbekistan
Colombia	Kuwait	Portugal	Vietnam
Croatia	Kyrgyzstan	Puerto Rico	Yemen
Czech Republic	Latvia	Qatar	Zimbabwe
Denmark	Lebanon	Romania	
Djibouti	Lesotho	Russia	

Table 2.4

Countries Reporting Crime Data - Distribution on Development Level

Development	Frequency	Percent
Low Dev	15	11.5
Med Dev	54	41.5
High Dev	38	29.2
Missing	23	17.7
Total	130	100

Table 2.5

Countries Reporting Crime Data - Distribution on Region

Region	Frequency	Percent
Africa	22	16.9
Latin America	24	18.5
N America, Europe, Oceania	47	36.2
Asia	37	28.5
Total	130	100

Table 2.6

Frequency of Reporting Total Crime Data: "Offenses Known to the Police", Arrests, and Sex-Specific Arrests

All Countries	Offenses Known		Arrests		Sex-Specific Arrests	
<i>Number of Years Report Data</i>	<i>Freq</i>	<i>%</i>	<i>Freq</i>	<i>%</i>	<i>Freq</i>	<i>%</i>
0	8	6.2	36	27.7	44	33.8
1	34	26.2	21	16.2	22	16.9
2	42	32.3	30	23.1	27	20.8
3	46	35.4	43	33.1	37	28.5
Low Development Countries	Offenses Known		Arrests		Sex-Specific Arrests	
<i>Number of Years Report Data</i>	<i>Freq</i>	<i>%</i>	<i>Freq</i>	<i>%</i>	<i>Freq</i>	<i>%</i>
0	2	13.3	7	46.7	9	60.0
1	5	33.3	2	13.3	2	13.3
2	6	40.0	4	26.7	3	20.0
3	2	13.3	2	13.3	1	6.7
Medium Development Countries	Offenses Known		Arrests		Sex-Specific Arrests	
<i>Number of Years Report Data</i>	<i>Freq</i>	<i>%</i>	<i>Freq</i>	<i>%</i>	<i>Freq</i>	<i>%</i>
0	2	3.7	13	24.1	17	31.5
1	16	29.6	10	18.5	10	18.5
2	17	31.5	13	24.1	13	24.1
3	19	35.2	18	33.3	14	25.9
High Development Countries	Offenses Known		Arrests		Sex-Specific Arrests	
<i>Number of Years Report Data</i>	<i>Freq</i>	<i>%</i>	<i>Freq</i>	<i>%</i>	<i>Freq</i>	<i>%</i>
0	0	0	6	15.8	7	18.4
1	7	18.4	6	15.8	6	15.8
2	13	34.2	9	23.7	8	21.1
3	18	47.4	17	44.7	17	44.7

Table 2.7

Correlation between Development and Number of Years Report Sex-Specific Arrest

Number of Years Report sex-specific arrests for:	Development
Total Crime	.36
Homicide	.26
Robbery	.26
Theft	.30
Fraud	.35

Table 2.8

Frequency of Reporting Sex-Specific Arrest Data

All Countries	Homicide		Robbery		Theft		Fraud	
<i># Years</i>	<i>Freq</i>	<i>%</i>	<i>Freq</i>	<i>%</i>	<i>Freq</i>	<i>%</i>	<i>Freq</i>	<i>%</i>
0	41	31.5	57	43.8	53	40.8	42	32.3
1	22	16.9	19	14.6	18	13.8	25	19.2
2	33	24.4	27	20.8	28	21.5	29	22.3
3	34	26.2	27	20.8	31	23.8	34	26.2
Low Development Countries	Homicide		Robbery		Theft		Fraud	
<i># Years</i>	<i>Freq</i>	<i>%</i>	<i>Freq</i>	<i>%</i>	<i>Freq</i>	<i>%</i>	<i>Freq</i>	<i>%</i>
0	5	35.7	7	46.7	8	53.3	8	53.3
1	3	21.4	5	33.3	3	20.0	3	20.0
2	4	28.6	3	20.0	3	20.0	4	26.7
3	2	14.3	0	0	1	6.7	0	0
Medium Development Countries	Homicide		Robbery		Theft		Fraud	
<i># Years</i>	<i>Freq</i>	<i>%</i>	<i>Freq</i>	<i>%</i>	<i>Freq</i>	<i>%</i>	<i>Freq</i>	<i>%</i>
0	17	31.5	23	42.6	24	44.4	17	31.5
1	8	14.8	7	13.0	6	11.1	9	16.7
2	15	27.8	15	27.8	13	24.1	14	25.9
3	14	25.9	9	16.7	11	20.4	14	25.9
High Development Countries	Homicide		Robbery		Theft		Fraud	
<i># Years</i>	<i>Freq</i>	<i>%</i>	<i>Freq</i>	<i>%</i>	<i>Freq</i>	<i>%</i>	<i>Freq</i>	<i>%</i>
0	7	18.4	13.5	34.2	9	23.7	7	18.4
1	7	18.4	5	13.2	7	18.4	7	18.4
2	9	23.7	5	13.2	6	15.8	8	21.1
3	15	39.5	15	39.5	16	42.1	16	42.1

Table 2.9

Countries with an Average Female Percentage of Arrests Outside of Range

	Female Percentage of Arrests				
	<i>Total</i>	<i>Homicide</i>	<i>Robbery</i>	<i>Theft</i>	<i>Fraud</i>
Albania			x	x	
Andorra		x			
Bangladesh			x		
Benin			x		x
Bolivia		x		x	
Brunei		x			
Djibouti			x		
Dominica		x		x	x
Ethiopia			x	x	
Finland					
Georgia	x				x
Iceland			x		
India		x			
Ireland		x			
Jordan		x			
Lebanon	x		x		x
Lesotho	x				
Libya				x	
Malaysia	x	x		x	x
Mali		x			
Mauritania		x			
Monaco		x	x		
New Zealand				x	
Paraguay			x		
Qatar		x			
Russia			x		
Saint Kitts and Nevis				x	
Saudi Arabia			x		
Syria	x	x	x		x
Tanzania	x		x	x	
Trinidad and Tobago			x		
United States				x	
Yemen			x		

Table 2.10

Countries with a Large Change in Female Percentage of Arrests over 1997 – 1999

Female Percentage of Arrests					
	<i>Total</i>	<i>Homicide</i>	<i>Robbery</i>	<i>Theft</i>	<i>Fraud</i>
Andorra		x			
Armenia			x		
Bahamas, The		x			
Barbados					x
Belarus				x	
Benin					x
Brunei		x			x
Ecuador		x			x
Estonia				x	
Ethiopia			x		
Ghana			x		
Hong Kong S.A.R.	x				
Iceland		x			
Japan			x		
Latvia			x		
Lithuania			x		
Luxembourg		x			
Monaco					x
Norway					
Qatar		x	x		
Russia					
Singapore		x			
Slovakia		x			
Slovenia			x		
Swaziland				x	
Syria				x	x
Trinidad and Tobago		x			
Turks and Caicos Islands				x	
Uruguay	x				
Uzbekistan				x	

Table 2.11

Number of Countries that Meet Data Quality Criteria

	Female Percentage of Arrests				
	<i>Total</i>	<i>Homicide</i>	<i>Robbery</i>	<i>Theft</i>	<i>Fraud</i>
At least 2 years data	64	67	54	59	63
In range	129	120	118	122	126
No large change	124	123	128	126	124
All three	61	55	46	49	57

Table 2.12

Countries Reporting Crime Data – Descriptive Statistics

	Mean	Standard Deviation
Human Development Index	.72	.17
Relative Female Status Index	.14	.61
Radios per 1,000	446	346
Years Data	7.4	4.1
Gini Index	38.3	9.8
Percent Under 20 Years	38.6	11.8

Table 2.13

Total FPA: Comparison of Study Sample and Excluded Cases (F value from comparison of means)

<i>Indicator</i>	Study Sample			Excluded Cases			<i>F value</i>
	<i>N</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>N</i>	<i>Mean</i>	<i>Standard Deviation</i>	
Human Development Index	53	.77	.14	54	.68	.19	8.3**
Relative Female Status Index	43	.21	.56	41	.06	.66	1.2
Radios per 1,000	59	464.7	276.7	67	430.8	399.9	.30
Years Data	61	9.2	3.6	47	5.0	3.5	36.6**
Gini Index	50	36.3	8.3	50	40.4	10.8	4.6*
% pop under 20	61	34.8	10.8	65	42.3	11.6	14.1**
FPA Total	61	11.2	4.7	25	12.9	14.0	.69

* $p \leq .05$ ** $p \leq .01$

Table 2.14

FPA Homicide Comparison of Study Sample and Excluded Cases (F value from comparison of means)

<i>Indicator</i>	Study Sample			Excluded Cases			<i>F value</i>
	<i>N</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>N</i>	<i>Mean</i>	<i>Standard Deviation</i>	
Human Development Index	51	.74	.15	56	.70	.18	1.43
Relative Female Status Index	38	.12	.63	46	.15	.60	0.05
Radios per 1,000	55	429.4	278.1	71	460.0	393.3	0.24
Years Data	55	8.9	3.8	53	5.8	3.9	17.0**
Gini Index	50	35.7	7.7	50	41.0	10.9	8.02**
% pop under 20	55	36.2	11.8	71	40.5	11.5	4.29*
FPA Homicide	55	8.92	4.61	33	10.47	14.65	0.53

* $p \leq .05$ ** $p \leq .01$

Table 2.15

FPA Robbery: Comparison of Study Sample and Excluded Cases (F value from comparison of means)

<i>Indicator</i>	Study Sample			Excluded Cases			<i>F value</i>
	<i>N</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>N</i>	<i>Mean</i>	<i>Standard Deviation</i>	
Human Development Index	41	.79	.12	66	.68	.19	10.9**
Relative Female Status Index	32	.26	.42	52	.06	.70	2.2
Radios per 1,000	45	474.6	273.5	81	431.1	382.2	.45
Years Data	46	9.4	3.5	62	5.8	3.9	24.3**
Gini Index	41	37.0	8.4	59	39.3	10.6	1.38
% pop under 20	46	33.9	10.9	80	41.3	11.5	12.58**
FPA Robbery	46	5.3	2.4	27	6.9	6.6	2.4

* $p \leq .05$ ** $p \leq .01$

Table 2.16

FPA Theft: Comparison of Study Sample and Excluded Cases (F value from comparison of means)

<i>Indicator</i>	Study Sample			Excluded Cases			
	<i>N</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>N</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>F value</i>
Human Development Index	44	.78	.14	63	.68	.18	9.6**
Relative Female Status Index	34	.22	.53	50	.08	.66	1.0
Radios per 1,000	49	491.0	281.0	77	418.4	381.9	1.3
Years Data	50	9.6	3.5	58	5.4	3.5	38.7**
Gini Index	43	36.3	7.2	57	39.8	11.1	3.25
% pop under 20	50	33.4	11.0	76	42.0	11.1	18.8**
FPA Theft	49	13.6	9.4	27	10.4	11.5	1.7

* $p \leq .05$ ** $p \leq .01$

Table 2.17

FPA Fraud: Comparison of Study Sample and Excluded Cases (F value from comparison of means)

<i>Indicator</i>	Study Sample			Excluded Cases			
	<i>N</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>N</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>F value</i>
Human Development Index	52	0.77	0.13	55	0.67	0.19	9.2**
Relative Female Status Index	40	0.25	0.50	44	0.03	0.69	2.6
Radios per 1,000	56	455.3	265.3	70	439.7	402.0	.06
Years Data	57	9.0	3.8	51	5.5	3.7	24.4**
Gini Index	52	36.8	8.2	48	40.0	11.1	2.7
% pop under 20	57	35.0	11.0	69	41.6	11.7	10.3**
FPA Fraud	57	16.2	9.0	31	17.2	14.6	.14

* $p \leq .05$ ** $p \leq .01$

Table 2.18
Range of Z Scores for Variables in Study Samples

	Study Sample Type:				
	<i>Total</i>	<i>Homicide</i>	<i>Robbery</i>	<i>Theft</i>	<i>Fraud</i>
Human Development Index	3.6	3.6	3.1	3.7	3.6
Relative Female Status Index	5.2	5.3	3.5	4.0	3.6
Radios per 1,000	3.0	3.0	3.0	3.0	3.0
Years Data	3.2	3.2	2.9	3.4	3.2
Gini Index	3.7	3.7	3.7	3.2	3.7
% pop under 20	3.2	3.4	3.4	3.6	3.4
FPA	2.5	2.7	2.3	3.7	3.3

Chapter 3

Descriptive Analysis

In this chapter we present a detailed descriptive analysis of the data used in this study. First, we perform a bivariate analysis of the relationships among the predictor variables. This includes an assessment of the feasibility of including them in multivariate analyses. Next, we perform a descriptive analysis of overall offending and the relationship between development and offending. There is a long tradition of scholars using descriptive and bivariate analysis to assess male and female crime rates, and the relationship between female share of arrests and structural-level predictors in a cross-national context (Chernoff & Simon, 2000, 2005; Simon, 1975; Simon & Landis, 1991). This chapter uses this approach in evaluating sex-specific offending rates, the female share of arrests, and how these measures relate to development. The final section presents bivariate correlations assessing the strength of the relationship between the predictor and control variables, and the female share of arrests. The conclusion lays the groundwork for the multivariate analysis that will be discussed in chapter 4.

Relationships among Predictor Variables

Aggregate-level studies are often confronted by the problem of multicollinearity, a high degree of correlation between predictor variables (some examples include: Land, McCall, & Cohen, 1990; Steffensmeier & Haynie, 2000a; Steffensmeier & Haynie, 2000b). Multicollinearity causes inflated standard errors and low power and can make it difficult to establish the independent effects of predictors (Agresti & Finlay, 1997). The

macro-level focus of this project, as well as preliminary correlations already presented, suggest that the question of multicollinearity needs to be further investigated. To do so, bivariate correlations among the predictor variables are performed on the study sample for each offense category¹². Recall that the size and composition of the study sample varies by offense type. For this reason, separate correlations were run for the study sample for total crime, homicide, robbery, theft, and fraud.

Table 3.1 displays the bivariate correlations between the Human Development Index and the other independent and control variables for the Study Sample. We begin by highlighting key findings regarding the correlation among measures of the relative status of women and between measures of the relative status of women and other predictor variables.

Relative Female Status: Correlations

One of the challenges in measuring the relative status of women is finding a measure that both captures the meaning of the concept and is empirically distinct from other indicators in the model¹³. The measure of development, the Human Development Index (HDI), has a high positive correlation with the Gender-related Development Index (GDI). Countries with a higher score on the Human Development Index also have a higher score on the Gender-related Development Index. Correlations between the GDI and the HDI average $r = .96$ (see Table 3.1). The high correlation between the Gender-related Development Index and the Human Development Index occurs because the GDI uses the same indicators as the HDI but includes an adjustment downward for gender

¹² Bivariate correlations were also run on the excluded cases. Results from the excluded cases were parallel to those obtained from using the study samples. Correlations among variables in the excluded samples tended to be weaker, but all were in the same direction as those found in the study samples.

¹³ The substantive meaning of the correlation between indicators of relative female status and development will be discussed in the “Discussion” section of chapter 5.

disparities in achievement.

The Gender Empowerment Measure (GEM), however, uses indicators that are different from those in the Human Development Index. Recall that the GEM includes: women's and men's estimated earned income, women's and men's percentage share of positions as legislators, senior officials, managers, and professional and technical occupations, and women's and men's percentage share of parliamentary seats. The positive correlation between this measure of relative female status and the Human Development Index indicates that countries that are more highly developed also have a higher relative status of women (defined as access to economic and political power and decision-making).

Table 3.2 ranks countries by their score on the Gender Empowerment Measure and also lists whether they are classified as high, medium, or low development countries. Table 3.2 includes all countries that report data to Interpol and are not missing a value on the Gender Empowerment Measure. Countries at the top of the list rank highest on the relative female status measure and thus have higher levels of relative female status. Note that although countries near the top of the ranking tend to be highly developed countries, highly developed countries also appear at the middle and bottom of the list, indicating that they have a lower relative status of women. For example, Kuwait and the United Arab Emirates rank 68th and 69th out of 78 countries in their level of relative status of women, but have a high overall level of development, according to the Human Development Index. Similarly, Trinidad and Tobago and Bulgaria both rank in the top 20 countries for the Gender Empowerment Measure but are categorized as medium development countries. This demonstrates that while there is a relationship between

overall development and the relative status of women, with more highly developed countries tending to have a higher relative status of women, the two concepts vary.

In order to assess the extent of the problem of multicollinearity, we examine the correlations between the Gender Empowerment Measure and other predictor variables. The correlation of the Gender Empowerment Measure and the Human Development Index is $r = .70$ in the study sample for only one offense—robbery. Correlations between variables that reach $r = .70$ indicate that half of the variation between the variables is shared, raising concerns about multicollinearity. The Gender Empowerment Measure is also highly correlated with the number of radios per 1,000 (the measure of opportunity for consumer crime). Table 3.3 displays the bivariate correlations between radios per 1,000 and the three indexes measuring the relative status of women. The correlations between radios and the Gender Empowerment Measure average $r = .77$ for the study samples across offense types. For this reason the alternative measure of the relative status of women, the Relative Female Status Index, will be substituted¹⁴.

Recall that the Relative Female Status Index includes the number of females per 100 males: enrolled in primary school and secondary school, employed as secondary school teachers, and economically active in the industry and service sectors. The average correlation between radios per 1,000 and the Relative Female Status Index across offense types in the study samples is $r = .24$. The correlations between the Human Development Index and the Relative Female Status Index also are not prohibitively high (average across offense types in the study samples is $r = .53$). There is enough separate variation among these variables to include the Relative Female Status Index in multivariate

¹⁴ In the multivariate analysis alternative indicators of relative female status will be substituted to further explore the relationship between relative female status and the female percentage of arrests.

analyses.

To summarize, because of their high correlations with development and radios per 1,000, the Gender-related Development Index and the Gender Empowerment Measure are not included in multivariate analysis. An alternative, the Relative Female Status Index, is substituted as its correlations with development and radios per 1,000 are not high enough to warrant substantial concerns about multicollinearity in multiple regression models.

Correlations with the Human Development Index

Development also has high correlations with the two other variables. The average correlation (across offense types) between radios per 1,000 (the measure of opportunity for consumer crime) and the Human Development Index for study sample is $r = .66$ (see Table 3.1). The positive correlation with radios per 1,000 suggests that more highly developed countries have more radios per 1,000. An alternative indicator, televisions per 1,000, was substituted. However, the correlations between televisions per 1,000 and development were even higher (average of $r = .75$). The high correlation between radios per 1,000 and development make interpretation of regression coefficients problematic. For this reason, a model will be run with all predictors except development, and with all predictors except radios per 1,000, in order to assess the results obtained when either variable is excluded from the model.

Recall that the formalization of the mechanisms of social control is measured as the number of years a country reports data (years data). As described in the missing variable analysis in the previous chapter, more highly developed countries tend to report more years of data and thus have higher values for years data. In the study sample,

correlations between the Human Development Index and years data are modest, averaging $r = .39$ across offense type (see Table 3.1).

We now consider the correlation between development and one of the control variables, percent young. There is a strong negative correlation between development and the measure of the percent of the population that is under 20 years of age (see Table 3.1). For the study samples, this correlation averages $r = -.84$ across offense types. This indicates that less developed countries have a larger proportion of their population under the age of 20. Because of its strong correlation with development and related concerns about multicollinearity, this control variable will not be included in the multivariate analysis.

Turning to the other control variable, income inequality, countries at higher levels of development tend to have less income inequality as measured by the Gini index. Considering the study sample, the correlations between development and the Gini index average $r = -.28$. Since the correlations of both formalization and the Gini index with the Human Development Index are not very strong, both measures will be included in the multivariate analysis.

This chapter began by assessing the bivariate relationships between the predictor variables in an effort to assess the feasibility of including predictors together in a multivariate model. Both the Gender-related Development Index and the Gender Empowerment Measure are too highly correlated with development and radios per 1,000 to be included in multivariate analyses, but the Relative Female Status Index has enough variation independent from the Human Development Index and radios per 1,000 to be included. To deal with the correlation between radios per 1,000 and development,

separate models are run. One model excludes radios per 1,000, and one excludes development, to assess the effects of each when the other is excluded from the model. Because of its high correlation with development, the control for the percent of the population that is young will not be included in the multivariate analysis.

Relationship between Development and Crime

The analysis in this section includes all countries that report data to Interpol. All countries are included to present the full range of variation in arrest rates and to assess how arrest rates and the female share of arrests vary by level of development. We begin the descriptive analysis of offenses known to the police and arrest rates. The correlation between total arrest rate and development, $r = .23$, is positive, indicating that more highly developed countries have a higher rate of arrest¹⁵. Table 3.4 ranks countries by total arrest rate and notes their classification as high, medium, or low development countries. Countries with low arrest rates tend to be low and medium development countries. However, there are also several examples of high development countries with relatively low rates of arrest: Ireland ranks 7th (out of 94 countries) and has an arrest rate of 137, Chile ranks 12th with an arrest rate of 260, Japan ranks 19th with an arrest rate of 362, and Portugal ranks 23rd with an arrest rate of 432. For comparison, high development countries with high rates of arrest include: Italy, ranked 64th with an arrest rate of 1,622; Israel, ranked 78th with an arrest rate of 2,726; and New Zealand, ranked 91st with an arrest rate of 6,876. This analysis of overall (male plus female) arrest rates establishes a foundation for the analysis of sex-specific arrest rates and the female share of arrests.

¹⁵ The correlation between development and offenses known is positive and moderately sized, $r = .31$, indicating that more highly developed countries also have a higher rate of offenses known to the police.

Sex-Specific Arrest Rates

Table 3.5 includes all countries that report data to Interpol and shows the female and male arrest rates. In a finding that provides more support for one of the most longstanding findings in criminological research, male arrest rates are higher than female rates for all offense types and for the total offense category. Both female and male arrest rates are highest for theft, while homicide offending rates are very low for both males and females. The correlation between the male and female arrest rates for total crime is $r = .69$. The strength of this relationship suggests that the factors that influence a nation's male arrest rate also affect female arrest rates.

Table 3.6 refers to all countries that report data to Interpol and shows mean male and female arrest rates. For total crime and for all crime categories, *with the exception of homicide*, both male and female rates of arrest are higher in countries with higher levels of development. In the case of homicide, arrest rates are lowest in high development countries and highest in medium development countries. The different pattern for homicide offending is in line with several studies that find differences in the impact of development on property as compared to violent offending (Bennett, 1991; Krohn, 1977; Neapolitan, 1995; Pratt & Godsey, 2002). When examining homicide specifically, several studies reveal that more highly developed countries have lower rates of homicide (Kick & LaFree, 1985; Lee, 2001; Messner & Rosenfeld, 1997). The patterns shown here seem to demonstrate a curvilinear relationship between development and homicide offending rates, with rates peaking in medium development countries.

Offender Profile Percentage

The above description focused on male and female rates of offending. Another

related but separate question deals with the types of offenses committed by males and females. Table 3.7 includes all countries that report data to Interpol and lists the male and female rates of offending and the offender profile percentage by offense from highest to lowest. The offender profile is a technique used by Steffensmeier and colleagues that represents “the *percentage of all arrests within each sex* that are arrests for that particular offense” (Steffensmeier, 1993, p. 418). Since Interpol data limit us to only five offense types that are somewhat reliably reported, we take care not to overstep the limits of the data in our assessment of the offender profile.

Among the offenses included in Interpol data, the most common offense for which females are arrested is theft, with a rate of 73.0 per 100,000. Theft is also the crime for which men are most likely to be arrested; however, their arrest rate is much higher—428.4 per 100,000. While theft is the most common offense for which both males and females are arrested, it makes up a larger proportion of female arrests—62.3%—than of all male arrests—52.4%. Other differences between the two offender profiles include the finding that robbery (defined as theft with violent or aggravating circumstances) makes up a larger proportion of all male arrests, 16.2%, than of all female arrests, 11.6%, while fraud makes up a larger proportion of all female than male arrests—24.8% for females and 16.2% for males. Homicide makes up a very small portion of all arrests for both males and females—2.8% for males and 1.2% for females. These results are in line with previous studies that find that minor types of theft offending are more common than major theft or violent offending for both men and women (Simon & Landis, 1991; Steffensmeier & Allan, 2000)

Female Percentage of Arrests

The above sections dealt with male and female levels of offending and the types of offenses committed by males and females. The research questions in this project focus more specifically on the male-female gap in offending. Looking back to Table 3.5, which includes all countries that report data to Interpol, we see the female share of arrests for total crime is 11.7%. This means that of all individuals arrested for the types of crime included in the “total” category, approximately 12% were females.

Table 3.8 includes all countries that report data to Interpol and ranks them from lowest to highest on female percentage of arrests for the total crime category. The table also includes male and female crime rates and the country’s level of development. It provides a picture of the female share of arrests in different countries. While countries near the top of the list (and thus with a lower female share of arrests) tend to be at the low and medium levels of development, there are also examples of high development countries with a low female percentage of arrests. High development countries with a low female percentage of arrests include Poland with an FPA of 8.7%, the Netherlands with an FPA of 9.4%, and Spain with an FPA of 9.7%.

Referring back to Table 3.6, we present the FPA for total crime and the four crime types included in this analysis: homicide, robbery, theft, and fraud. It is important to note that previous studies have found differences in the female share of arrests for different crime types (see Steffensmeier, 1993 for a review). Examining total crime rates may mask considerable variation in the female percentage of arrests across different types of offending. To assess this variation by crime type, we consider the female percentage of arrests for homicide, robbery, theft, and fraud. We find that when considering all

countries (not separated by level of development), females comprise the largest proportion of fraud offenders—16.6%. The next largest category for female percentage of arrests is also a property offense, theft. Females account for 12.5% of theft arrests. For the two remaining types of offenses, homicide and robbery, females account for 9.5% and 5.9% of arrests, respectively. Both offense types may be considered to be violent or to have a physical confrontational component. Other cross-national comparisons of the female share of arrests also find that this share is greater for property than violent types of offenses (Simon & Ahn-Redding, 2005; Steffensmeier, Allan, & Streifel, 1989)¹⁶.

Table 3.9 presents correlations between female share of arrests for total offenses and for each offense category for all countries that report data to Interpol. The correlations are all positive but vary in magnitude. The weakest correlation is that between FPA for homicide and FPA for theft, $r = .29$ and the strongest is between FPA for total crime and FPA for robbery, $r = .78$. These figures indicate that countries that rank higher on female share of arrests for one crime type tend to rank higher on female share of arrests for other types of crime.

Development and Female Percentage of Arrests

Looking back at Table 3.6 (which includes all countries that report data to Interpol), we see the mean female percentage of arrests for countries at low, medium, and high levels of development. The female percentage of arrests for total offenses is greater in countries at higher levels of development. This is in line with previous studies that found a greater proportion of female offending in more highly developed countries

¹⁶Scholars have contributed more extensive examinations of the female share of arrests when using samples limited to the United States. These studies also find that the female share of arrests tends to be lower for violent than for property offending (Steffensmeier, 1993; Steffensmeier & Allan, 2000; Steffensmeier & Allan, 1996).

(Simon & Ahn-Redding, 2005; Steffensmeier et al., 1989).

The difference in the female percentage of arrests across countries at different levels of development varies by crime type. For theft and fraud, the female share of arrests is higher in more highly developed countries. The female percentage of arrests for theft in high development countries, 20.9%, is more than twice the female percentage of arrests in medium development countries, 7.9%. For fraud offending, the difference in female share of arrests between countries at the three levels of development is about 5%: 10.5% for low development countries, 15.8% for medium development countries, and 19.4% for high development countries. The two property offenses display larger differences across countries at different levels of development than robbery or homicide.

Differences across countries at different levels of development are small for female share of arrests for robbery and homicide. For robbery this percentage ranges from 5.0% in low development countries to 6.9% in high development countries. The female share of homicide offending is higher in low development countries, 9.1%, than in medium development countries, 8.4%, but the female share is still highest in high development countries, 10.8%. Again, the range in the female percentage of arrests across countries at different levels of development is very small. This demonstrates that the proportion of homicide and robbery arrests accounted for by females varies only minimally cross nationally. Recall that females account for a smaller proportion of all homicide and robbery arrests than for any other offense type. This demonstrates that cross-nationally females account for a small proportion of arrests for these two violent offenses.

In this first assessment of the relationship between development and the female

share of arrests, it appears that the female percentage of arrests is higher in more highly developed countries (although the amount of variation in the FPA for homicide and robbery is small). To further assess this relationship, an evaluation of bivariate correlations between predictor variables and the female percentage of arrests is provided below.

Correlations between Predictors and Female Share of Arrests

This section focuses on bivariate correlations, examining the strength of the relationships between female share of arrests and each of the predictor and control variables. These figures are presented in Table 3.10. Recall that the size and composition of the sample varies depending on offense type. This analysis was performed only on the study samples, as opposed to all countries that report data to Interpol, in order to be comparable to the multivariate analysis, which is also limited to the study sample.

The correlations between the Human Development Index and female share of arrests for all crime categories, as well as for total offenses, are moderate and positive. The direction indicates that more highly developed countries have a higher female share of arrests. The coefficients are larger for theft ($r = .60$) and robbery ($r = .57$), and more moderate for total crime ($r = .49$), homicide ($r = .39$), and fraud ($r = .34$).

The correlations between the Relative Female Status Index and the female percentage of arrests are weak to moderate, depending on which offense is considered. The strongest correlation is between the Relative Female Status Index and FPA for fraud, $r = .47$, but correlations with the other offenses are considerably weaker: total crime, $r =$

.30; homicide, $r = .24$; robbery, $r = .14$, and theft, $r = .12$.

The measure of opportunity for consumer crime, number of radios per 1,000, is positively correlated with female share of arrests for all offense types. The coefficients are moderate in size, ranging from $r = .30$ for robbery to $r = .42$ for theft. Countries with a larger number of radios per 1,000 have a higher female share of arrests.

Countries that report more years of sex-specific arrest data and thus have higher values for the formalization of the mechanisms of the social control measure, have a higher female share of arrests for all offenses except fraud. Coefficients for the relationship between formalization and robbery ($r = .42$), and formalization and theft ($r = .40$), are moderate in size. Correlations with total crime ($r = .24$) and homicide ($r = .26$) are small but still positive. The correlation between formalization the FPA for fraud is negative, but very small in size, $r = -.12$.

Turning to the control variables, countries with a higher level of income inequality have a lower female share of arrests for all offenses. However, these coefficients are weak—the strongest is for robbery ($r = -.22$). The percent young variable is also negatively related to the female share of offending. Countries with a higher percent of the population under 20 years of age have a smaller female share of arrests for all offenses. These correlations are moderate in magnitude, ranging from $r = -.33$ for homicide to $r = -.59$ for robbery.

Bivariate correlations demonstrate that the predictor variables tend to have stronger relationships with female share of arrest for less serious and less violent forms of offending. Countries with a higher level of development and with more radios per 1,000 have a higher female share of arrests. The Relative Female Status Index, has relatively

weak correlation with female share of arrests (except for fraud, $r = .47$). Countries with a higher score on the formalization measure also have a higher female percentage of arrests for all offenses except fraud.

Conclusions

This chapter presented a preliminary analysis of cross-national arrest rates, sex-specific arrest rates, and the female share of arrests, as well as bivariate correlations among predictors and between predictors and the female share of arrests. Due to the high correlations of development and radios per 1,000 to both the Gender-related Development Index and the Gender Empowerment Index, these two indicators of the relative status of women are not included in the multivariate analysis. The Relative Female Status Index will be used to assess the relative status of women. Also, due to its high correlation with development, the control variable percent young is not included in the multivariate analyses.

The overall (male and female) rate of arrests varies across countries. Higher development countries tend to have higher arrest rates. This finding remains true when considering sex-specific offending rates as well. Theft makes up the largest share of arrests for both males and females, just as homicide offending makes up a very small share of all arrests for both sexes. The female percentage of arrests provides an assessment of the male-female gap in offending. The FPA is largest for fraud (16.6%) followed by theft (12.5%). The FPA is smaller for the two offense types with violent/confrontational components: homicide (9.5%) and robbery (5.9%). Countries at higher levels of development tend to have a higher female share of arrests. The

relationship is stronger for robbery and theft, and more moderate for total crime, homicide, and fraud. A higher number of radios per 1,000 is moderately associated with a higher female share of arrest. A higher score on the formalization measure is associated with a higher female share of offending for all offense types except fraud.

In exploring cross-national levels of arrest rates and female share of arrests, this chapter has provided a foundation for further analysis. Descriptive tables of mean levels of male and female arrest rates and the female percentage of arrests for countries at different levels of development provide a picture of the scope of crime cross-nationally and how it varies by level of development. Correlations between predictors and the female share of arrests establish a baseline understanding of the relationship between development (as well as other predictor variables) and the female share of arrests.

Multivariate regression techniques applied in the next chapter allow for a more thorough examination of these relationships. Using ordinary least squares regression allows for better prediction of the female share of arrests by including multiple explanatory factors. This technique also permits analysis of partial relationships between predictors and the female share of arrests, controlling for the effects of other variables in the model. Third, applying the Clogg test of mediation enables an assessment of the extent to which the effect of development is mediated by the other predictor variables included in the model.

Table 3.1

Study Sample: Correlation of Predictor Variables with the Human Development Index*

	Study Sample - Total Crime	Study Sample - Homicide	Study Sample - Robbery	Study Sample - Theft	Study Sample - Fraud	Study Sample - Average across all offenses
	Human Dev. Index	Human Dev. Index	Human Dev. Index	Human Dev. Index	Human Dev. Index	Human Dev. Index
Relative Female Status Index	.59	.63	.34	.57	.50	.53
Gendered Development Index	.96	.97	.94	.96	.95	.95
Gender Empowerment Measure	.68	.68	.70	.67	.67	.68
Radios	.61	.68	.65	.69	.65	.66
Years Data	.25	.35	.45	.53	.34	.38
Gini Index	-.25	-.30	-.19	-.35	-.29	-.28
% pop under 20	-.82	-.86	-.86	-.84	-.82	-.84

* The number and composition of the “Study Sample” varies by offense type and thus separate correlations were run for each offense type.

¹ Total crime category includes arrests for each of the five offenses types as well as additional types of offenses that are not separately categorized or reported in Interpol figures.

Table 3.2

*All Countries Reporting Data to Interpol: Rank Order by Score on “Gender Empowerment Measure”**

Rank	Country	Gender	
		Empowerment Measure Score	Development Level
1	Sweden	.757	High
2	Norway	.752	High
3	Finland	.722	High
4	Denmark	.683	High
5	Canada	.655	High
6	New Zealand	.637	High
7	Netherlands	.625	High
8	United States	.623	High
9	Austria	.610	High
10	Italy	.585	High
11	Australia	.568	High
12	Barbados	.545	High
13	Luxembourg	.542	High
14	Trinidad and Tobago	.533	Medium
15	Bahamas, The	.533	High
16	Switzerland	.513	High
17	Hungary	.506	High
18	United Kingdom	.483	High
19	Bulgaria	.481	Medium
20	Belgium	.479	High
21	China	.474	Medium
22	Ireland	.469	High
23	Guyana	.461	Medium
24	Spain	.452	High
24	Japan	.442	High
26	Colombia	.435	Medium
26	Philippines	.435	Medium
28	Portugal	.435	High
29	Poland	.432	High
29	Panama	.430	Medium
31	Singapore	.424	High
32	Argentina	.415	High
33	Dominican Republic	.412	Medium
34	Honduras	.406	Medium
35	Chile	.402	High
36	Peru	.400	Medium
37	Zimbabwe	.398	Medium
38	El Salvador	.397	Medium
39	Malaysia	.384	Medium
40	Namibia	.376	Medium

Rank	Country	Gender	
		Empowerment Measure Score	Development Level
41	Ecuador	.375	Medium
42	Thailand	.373	Medium
43	Belize	.369	Medium
44	Indonesia	.362	Medium
45	Uruguay	.361	High
46	Brazil	.358	Medium
47	Swaziland	.357	Medium
48	Romania	.352	Medium
49	Mauritius	.350	Medium
49	Mozambique	.350	Low
51	Bolivia	.344	Medium
52	Paraguay	.343	Medium
52	Greece	.343	High
54	Cameroon	.339	Medium
54	Lesotho	.339	Medium
56	Burundi	.337	Low
57	Malta	.334	High
58	Nepal	.315	Low
59	Fiji	.314	Medium
60	Ghana	.313	Medium
61	Sri Lanka	.288	Medium
62	Bangladesh	.287	Low
63	Syria	.285	Medium
64	Angola	.278	.
65	Benin	.271	Low
66	Algeria	.266	Medium
67	Tunisia	.254	Medium
68	Kuwait	.241	High
69	United Arab Emirates	.239	High
70	Mali	.237	Low
71	Turkey	.234	Medium
72	Jordan	.230	Medium
73	India	.226	Medium
74	Lebanon	.212	Medium
75	Ethiopia	.205	Low
76	Mauritania	.163	Low
77	Pakistan	.153	Low
78	Djibouti	.130	Low

* The gender empowerment measure is reported for only 78 of the countries that report data to the Interpol.

Table 3.3

Study Sample: Correlation with Radios per 1,000*

	Study Sample - Total Crime	Study Sample - Homicide	Study Sample - Robbery	Study Sample - Theft	Study Sample - Fraud	Study Sample - Average across all offenses
	Radios per 1,000	Radios per 1,000	Radios per 1,000	Radios per 1,000	Radios per 1,000	Radios per 1,000
Relative Female Status Index	.30	.34	.12	.23	.21	.24
Gendered Development Index	.75	.77	.73	.74	.72	.74
Gender Empowerment Measure	.78	.78	.76	.78	.74	.77

* The number and composition of the “Study Sample” varies by offense type and thus separate correlations were run for each offense type.

¹ Total crime category includes arrests for each of the five offenses types as well as additional types of offenses that are not separately categorized or reported in Interpol figures.

Table 3.4

All Countries Reporting Data to Interpol: Rank Order by Arrest Rate per 100,000 for Total Crime¹

Rank	Country	Rate of Arrests	Level of Development
1	Syria	20.3	Medium
2	Mali	33.4	Low
3	Nepal	63.9	Low
4	Vietnam	92.7	Medium
5	Saudi Arabia	107.4	Medium
6	Peru	125.2	Medium
7	Ireland	137.5	High
8	Cameroon	156.5	Medium
9	Georgia	200.4	.
10	Albania	209.8	Medium
11	Benin	211.4	Low
12	Chile	259.6	High
13	Azerbaijan	268.4	.
14	Algeria	287.4	Medium
15	Panama	290.6	Medium
16	Malaysia	308.6	Medium
17	Uganda	347.7	Low
18	Mauritania	360.8	Low
19	Japan	361.8	High
	Bosnia and	392.4	.
20	Herzegovina		
21	Armenia	404.6	Medium
22	Uzbekistan	412.7	Medium
23	Portugal	431.8	High
24	Oman	441.1	Medium
25	Ecuador	464.3	Medium
26	Singapore	469.3	High
27	Bangladesh	483.7	Low
28	Paraguay	492.3	Medium
29	Moldova	504.2	Medium
30	Colombia	564.7	Medium
31	Argentina	583.6	High
32	Spain	683.8	High
33	Tanzania	697.2	Low
34	Turkey	749.5	Medium
35	Croatia	752.9	Medium
36	Hong Kong S.A.R.	756.5	High
37	Ethiopia	799.2	Low
38	Kyrgyzstan	804.5	.
39	Belarus	806.5	Medium
40	Ukraine	810.1	Medium

Rank	Country	Rate of Arrests	Level of Development
41	Lithuania	872.3	Medium
42	Latvia	898.8	Medium
43	Kazakhstan	907.3	Medium
44	Estonia	933.5	Medium
45	Trinidad and Tobago	996.6	Medium
46	Guyana	1,010.9	Medium
47	Slovakia	1,049.5	.
48	Bolivia	1,058.8	Medium
49	United Kingdom	1,069.9	High
50	Brunei	1,090.3	.
51	Qatar	1,178.6	.
52	Sweden	1,182.0	High
53	Mongolia	1,209.2	Medium
54	Poland	1,231.8	High
55	Russia	1,277.8	Medium
56	Romania	1,311.0	Medium
57	Kuwait	1,423.2	High
58	Macedonia	1,427.1	.
59	Bulgaria	1,440.6	Medium
60	Czech Republic	1,456.8	High
61	Switzerland	1,469.0	High
62	Bahamas, The	1,470.2	High
63	Hungary	1,590.1	High
64	Italy	1,622.5	High
65	Libya	1,777.1	.
66	Barbados	1,814.3	High
67	Andorra	1,851.9	.
68	Fiji	1,992.5	Medium
69	Norway	2,004.3	High
70	Tunisia	2,038.3	Medium
71	Netherlands	2,102.6	High
72	Slovenia	2,123.0	High
73	Jamaica	2,131.4	Medium
74	Canada	2,254.4	High
75	Lesotho	2,468.8	Medium
76	Uruguay	2,488.5	High
77	Monaco	2,676.8	.
78	Israel	2,726.2	High
79	Swaziland	2,767.1	Medium
80	Austria	3,051.2	High
81	Germany	3,300.1	High
82	United Arab Emirates	3,374.3	High
83	Mauritius	3,418.4	Medium

Rank	Country	Rate of Arrests	Level of Development
84	Turks and Caicos Islands	3,655.5	.
85	Luxembourg	3,677.4	High
86	Greece	3,686.3	High
87	Zimbabwe	3,890.1	Medium
88	Lebanon	4,293.0	Medium
89	Saint Kitts and Nevis	4,405.1	.
90	Gibraltar	4,605.1	.
91	New Zealand	6,876.1	High
92	United States	7,175.7	High
93	India	7,274.2	Medium
94	Finland	8,196.8	High

¹ Total crime category includes arrests for each of the five offenses types, as well as additional types of offenses that are not separately categorized or reported in Interpol figures.

Table 3.5

All Countries Reporting Data to Interpol: Male and Female Arrest Rate, Female Percentage of Arrests

	Female Rate	Male Rate	Female Percentage of Arrests*	N
Total Crime ¹	420.5	2,831.6	11.7	86
Homicide	1.4	22.7	9.5	88
Robbery	13.6	233.3	5.9	73
Min Theft	73.0	428.4	12.5	76
Fraud	29.0	132.5	16.6	88

* The male and female rates presented here are the average across 1997 - 1999. However, the FPA was calculated in each year and then averaged for use in this analysis. Thus the female percentage of arrests in this table is not be exactly the same figure attained from performing the calculations on the averaged male and female rates presented in this table.

¹ Total crime category includes arrests for each of the five offenses types as well as additional types of offenses that are not separately categorized or reported in Interpol figures.

Table 3.6

All Countries Reporting Data to Interpol: Mean and Standard Deviation for Male and Female Arrest Rate; Female Percentage of Arrests

	Female Rate	Standard Deviation	Male Rate	Standard Deviation	Female Percentage of Arrests	Standard Deviation	N
Total							
All Countries*	420.5	604.0	2,831.6	2,925.9	11.7	8.5	86
Low Dev Countries	51.6	67.6	1,015.4	807.2	5.0	4.0	6
Med Dev Countries	270.9	501.1	2,119.9	2545.5	11.3	11.22	37
High Dev Countries	689.3	737.4	3,835.3	3381.7	14.4	4.3	31
Homicide							
All Countries	1.4	1.6	22.7	40.0	9.5	9.6	89
Low Dev Countries	1.4	1.5	22.5	14.9	9.1	15.8	9
Med Dev Countries	1.8	1.8	36.3	57.9	8.4	10.0	37
High Dev Countries	1.1	0.9	9.8	10.2	10.8	5.6	31
Robbery							
All Countries	13.6	18.0	233.3	267.4	5.9	4.4	73
Low Dev Countries	2.5	4.5	60.5	93.1	5.0	8.4	8
Med Dev Countries	13.1	17.7	271.4	307.4	5.3	4.2	31
High Dev Countries	20.3	21.2	287.1	255.7	6.9	2.6	25
Theft							
All Countries	73.0	126.3	428.4	434.7	12.5	10.2	76
Low Dev Countries	3.7	5.7	107.2	113.5	3.8	5.3	6
Med Dev Countries	28.5	31.4	393.5	417.3	7.9	5.5	30
High Dev Countries	150.9	176.2	517.2	464.7	20.9	10.6	29
Fraud							
All Countries	29.0	58.9	132.5	270.0	16.6	11.2	87
Low Dev Countries	7.8	18.3	16.1	17.8	10.5	11.4	7
Med Dev Countries	9.6	14.0	62.5	85.5	15.8	12.9	37
High Dev Countries	59.6	87.5	259.0	413.5	19.4	8.3	31

* Some countries are missing values for the Human Development Index. For this reason the sample size for all countries is larger than the sum of the samples from low, medium and high development countries.

Table 3.7

All Countries Reporting Data to Interpol: Offender Profile for Males and Females

	Female Rate	Profile Percentage		Male Rate	Profile Percentage
Theft	73.0	62.3%	Theft	428.4	52.4%
Fraud	29.0	24.8%	Robbery	233.3	28.6%
Robbery	13.6	11.6%	Fraud	132.5	16.2%
Homicide	1.4	1.2%	Homicide	22.7	2.8%

Table 3.8

All Countries Reporting Data to Interpol: Rank Order of Female Percent of Arrests for Total Crime, Male and Female Arrest Rate, Level of Development*

Rank	Country	Female Rate	Male Rate	Female Percentage of Arrests	Level of Development
1	Tanzania	3.2	2,386.9	.13	Low
2	Malaysia	1.5	620.5	.25	Medium
3	Georgia	2.2	430.9	.52	.
4	Lebanon	54.3	8,008.4	.67	Medium
5	Saudi Arabia	2.6	180.0	1.44	Medium
6	Saint Kitts and Nevis	171.4	8,881.8	1.89	.
7	Bangladesh	24.2	917.6	2.56	Low
8	Nepal	4.4	121.2	2.81	Low
9	Albania	15.3	464.4	3.21	Medium
10	Trinidad and Tobago	61.0	1,894.2	3.42	Medium
11	Algeria	25.9	547.2	4.52	Medium
12	India	645.8	1,3501.2	4.56	Medium
13	Libya	177.0	3,270.1	5.18	.
14	Benin	27.1	412.2	5.43	Low
15	Slovakia	139.3	2,035.5	6.40	.
16	Ecuador	64.1	923.4	6.42	Medium
17	Armenia	58.7	811.9	6.79	Medium
18	Mongolia	172.7	2,263.6	7.09	Medium
19	Guyana	146.3	1,882.1	7.18	Medium
20	Brunei	145.2	1,921.1	7.20	.
21	Oman	40.9	692.8	7.25	Medium
22	Bahamas, The	221.4	2,797.1	7.47	High
23	Colombia	70.6	860.6	7.58	Medium
24	Barbados	287.6	3,501.3	7.63	High
25	Estonia	156.9	1,884.9	7.69	Medium
26	Uganda	70.4	828.3	7.83	Low
27	Azerbaijan	44.9	513.6	8.03	.

Rank	Country	Female Rate	Male Rate	Female Percentage of Arrests	Level of Development
28	Latvia	166.4	1,791.2	8.50	Medium
29	Poland	222.9	2,326.2	8.73	High
30	Cameroon	29.5	283.8	8.89	Medium
31	Croatia	140.2	1,427.8	8.95	Medium
32	Turks and Caicos Islands	676.0	6,415.4	9.11	.
33	Turkey	137.0	1,350.9	9.31	Medium
34	Netherlands	412.7	3,997.9	9.36	High
35	Argentina	115.1	1,075.5	9.40	High
36	Czech Republic	284.0	2,723.3	9.42	High
37	Moldova	101.0	967.4	9.45	Medium
38	Panama	54.7	522.4	9.46	Medium
39	Peru	23.8	226.2	9.53	Medium
40	Tunisia	391.1	3,687.2	9.59	Medium
41	Spain	140.0	1,261.0	9.70	High
42	Bulgaria	285.6	2,683.3	9.73	Medium
43	Uruguay	474.1	4,674.2	9.78	High
44	Swaziland	569.5	5,115.6	10.09	Medium
45	Kyrgyzstan	170.2	1,491.5	10.24	.
46	Ireland	29.1	249.7	10.99	High
47	Slovenia	486.6	3,891.9	11.17	High
48	Ethiopia	180.2	1,426.1	11.27	Low
49	Hungary	379.2	2,955.2	11.37	High
50	Uzbekistan	97.0	744.1	11.53	Medium
51	Kazakhstan	219.3	1,666.9	11.63	Medium
52	Lithuania	218.0	1,637.7	11.75	Medium
53	Fiji	474.6	3,517.7	11.95	Medium
54	Ukraine	216.4	1,528.9	12.34	Medium
55	Chile	65.5	461.9	12.41	High
56	Russia	342.5	2,388.6	12.49	Medium
57	Bolivia	271.0	1,893.6	12.52	Medium
58	Mauritius	877.0	6,055.2	12.64	Medium
59	Romania	343.6	2,343.2	12.79	Medium
60	Andorra	456.9	3,111.3	12.89	.
61	Israel	718.3	4,804.1	13.01	High
62	Qatar	233.4	1,550.2	13.13	.
63	Switzerland	405.6	2,580.5	13.57	High
64	Luxembourg	1,032.3	6,469.1	13.77	High
65	Finland	2,378.7	14,440.6	14.27	High
66	Greece	1,070.9	6,421.7	14.29	High
67	Norway	629.0	3,434.8	15.48	High

Rank	Country	Female Rate	Male Rate	Female Percentage of Arrests	Level of Development
68	United Kingdom	353.6	1,828.9	16.20	High
69	Kuwait	407.0	2014.85	16.77	High
70	Gibraltar	1,209.1	5939.27	16.91	.
71	Belarus	301.8	1400.53	17.73	Medium
72	Hong Kong S.A.R.	272.2	1256.97	17.81	High
73	New Zealand	2,515.7	11395.07	18.08	High
74	Monaco	1,033.9	4537.22	18.26	.
75	Sweden	440.1	1955.19	18.37	High
76	Singapore	176.9	776.29	18.55	High
77	Canada	858.7	3702.51	18.79	High
78	Portugal	168.6	722.03	18.86	High
79	United Arab Emirates	1,072.2	4619.85	19.38	High
80	Austria	1,228.4	5025.74	19.64	High
81	Japan	146.5	590.05	19.89	High
82	United States	2,922.4	11659.01	20.04	High
83	Germany	1,454.2	5280.80	21.59	High
84	Paraguay	227.9	758.50	23.44	Medium
85	Syria	18.2	22.33	44.76	Medium
86	Lesotho	3,000.1	1889.24	61.36	Medium

* The male and female rates presented here are the average across 1997 - 1999. However, the FPA was calculated in each year and then averaged for use in this analysis. Thus the female percentage of arrests in this table may not be exactly the same figure one would expect from performing the calculations on the averaged male and female rates presented in this table.

Table 3.9

All Countries that Report Data to Interpol: Correlations Among Female Percentage of Arrests for Different Crime Categories

	FPA Total Crime	FPA Hom.	FPA Rob.	FPA Theft	FPA Fraud
FPA Total Crime	1.00				
FPA Homicide	.38	1.00			
FPA Robbery	.78	.47	1.00		
FPA Theft	.62	.29	.57	1.00	
FPA Fraud	.43	.44	.47	.38	1.00

Table 3.10

Study Sample: Correlations of Dependent Variables with Predictor and Control Variables

	FPA Total	FPA Homicide	FPA Robbery	FPA Theft	FPA Fraud
Human Development Index	.49	.39	.57	.60	.34
Relative Female Status Index	.30	.24	.14	.12	.47
Radios	.35	.36	.30	.42	.32
Years Data	.24	.26	.42	.40	-.12
Gini Index	-.05	-.13	-.22	-.08	-.14
% pop under 20	-.43	-.33	-.59	-.40	-.45

Chapter 4

Multivariate Analysis

To evaluate further the effect of development on the female share of arrests, including the impact of mediating variables, we present results for the Ordinary Least Squares regression analyses. These analyses focus on the central question of how development, measured using the Human Development Index, impacts the female share of offending, measured according to the female percentage of arrests. We explore the question of whether countries at higher levels of development have a higher female share of offending. We also investigate whether and how the relationship between development and the female share of offending is explained by relative female status, measured using a composite index and several alternative indicators; formalization of the mechanisms of social control, primarily measured as the number of years a country reports sex-specific arrest rates; and opportunity for consumer crime, measured as the number of radios per 1,000.

Introduction to the Analysis

We begin by assessing the effects of development on the female percentage of arrests for each of the five offense categories: total crime, homicide, robbery (defined as theft with violent or aggravating circumstances), theft, and fraud (defined as any act of gaining unlawful possession of another person's property other than by theft). First, the female percentage of arrests is regressed only on development and the control measure

for income inequality, the Gini index¹⁷. Next, those mediators that have a statistically significant relationship to development are included with development and the Gini index to predict the female percentage of arrests. The Clogg test of mediation is performed to compare the coefficients for development in the full and reduced models in order to examine the extent to which the effect of development is explained by the mediating variables.

To clarify further the relationships between the explanatory variables and the female percentage of arrests, additional analyses are performed. These analyses consider the effect of each of the explanatory variables, *controlling for all others*. All of the models include development, the Gini index, radios, years data, and a measure of the relative status of women.

A Note about Samples

In chapter 2 the criteria used to select countries for the analysis were described. The study sample, which is comprised of those countries that meet all three data quality criteria, was compared to the excluded cases. An attempt is made to run the multivariate analyses in this chapter on both the study sample and the excluded cases so that the results may be compared. However, the sample size for the excluded cases is too small for multivariate models—about 13 countries per offense type. As an alternative basis for comparison, we use the entire sample of cases that report data to Interpol. This allows us to assess the effect of excluding the cases.

In order to empirically assess the differences in use between the two samples, we create a dummy variable that reflects whether or not a case is in the study sample. The

¹⁷ While the Gini index is included as a control, its effects are not statistically significant and the coefficients are not shown.

dummy variable, and terms for the interaction between the dummy variable and each predictor, are included in regression models using all countries that report data to Interpol. This interaction term is only statistically significant for the Relative Female Status Index in the total crime category. *For all other mediating variables, in all other offense types, there is no significant difference in the effect of the predictor variable, depending on which sample is used*¹⁸. Given that only one out of 20 coefficients for assessing the interaction between sample type and each of the mediating variables is significant, this finding should not be given too much weight. For this reason, the remainder of the analyses are performed on the study sample.

Addressing Sample Size

The size of the study sample varies by type of offense, but averages 50 countries. In the multivariate analysis listwise deletion is used. Therefore, countries that are missing values on any of the predictor variables are not included in the analysis¹⁹. Our primary measure of relative female status, the Relative Female Status Index, is also the predictor variable with the most missing data. Use of the Relative Female Status Index reduces the final sample size to approximately 32 countries per offense. The Relative Female Status Index sample is referred to as “Sample A”.

To help mitigate the problem of missing data, we also estimate models using the service sector sex ratio²⁰ instead of the Relative Female Status Index. The average sample size using the service sector sex ratio is about 48 countries per offense. The

¹⁸ For total crime, for robbery, and for fraud, there was a significant interaction between the dummy variable and the control variable, Gini index.

¹⁹ Analyses were run using pairwise deletion and also using mean substitution for missing values. In both cases the findings were similar to those using listwise deletion. The effects of formalization of the mechanisms of social control were not as strong. The coefficients for formalization were still positive but none reached statistical significance. The effects of the Relative Female Status Index and radios per 1,000 were also similar for all sample types.

²⁰ This is the number of women per 100 men who are employed in the service sector.

service sector sex ratio sample is referred to as “Sample B”. Because both of these samples are small we use a more liberal significance level, $p \leq .10$.

The Effect of Development on the Female Percentage of Arrests

Table 4.1 presents the coefficients for the effect of development on the female percentage of arrests for each offense category, without including mediating variables. The Gini index *is* included as a control for the level of income inequality. However, because its effects are not statistically significant, the coefficients are not shown in the tables. Table 4.1 includes results for sample A and sample B.

For all of the offense categories, the coefficient for development is positive, large, and statistically significant. More highly developed countries have a higher female percentage of arrests across all offense categories. A one-unit increase in development is associated with an 18% increase in the female percentage of arrests for total crime. The adjusted R^2 shows that development explains the most variation in the female percentage of arrests for theft, 37%, while development explains only 15% of the variation in the FPA for homicide.

Development, Mediators, and the Female Percentage of Arrests

Development was a significant predictor of each of the mediating variables²¹: radios (measuring opportunity for consumer crime), years data (measuring formalization of the mechanisms of social control), Relative Female Status Index (primary measure of relative female status), and service sector sex ratio (alternative measure of relative female status). Each mediating variable is individually entered with development in models

²¹ A table of these regression coefficients appears in appendix A.

predicting the female percentage of arrests for each offense category.

Table 4.2 presents the standardized coefficients for the effects of development and each of the mediating variables on FPA. Each mediator (radios, years data, Gender Equality index, and service sector sex ratio) is entered individually with development. Radios is not a significant predictor of FPA in either sample. This is likely due to the correlation between radios and development. The coefficients for years data are positive and statistically significant for total crime, homicide, robbery, and theft in sample A, and for robbery in sample B. This indicates that countries that report more years of data have a higher FPA for the offenses listed. The Relative Female Status Index is not a significant predictor of the female percentage of arrests for any offense type. The service sector sex ratio is a significant predictor only of the FPA for fraud, $B = .47$.

To assess the mediation effects of these variables, the Clogg test is applied. The Clogg test is significant for the effect of years data on the FPA for robbery in sample A ($z=1.76$, $p = .10$). This indicates that years data significantly mediates the effect of development on the FPA for robbery. The Clogg test, in assessing the mediation effects of years data for total crime, homicide, and theft in Sample A, is not statistically significant. The mediation effect of service sector sex ratio for fraud in Sample B is also not statistically significant according to the Clogg test. However, bivariate analysis performed in chapter 3 demonstrated that some of the predictor variables are highly correlated with one another (particularly development and radios), making the coefficients difficult to interpret.

Additionally, the literature has shown that when assessing the relationship between predictor variables and the female share of arrests, it is important to control for

the effect of other variables (Hartnagel, 1982; Hartnagel & Mizanuddin, 1986; Steffensmeier et al., 1989).

Effects of Independent Variables, Net of Controls

We next assess the impact of each of the proposed independent variables, controlling for the effects of all other independent variables. Models in this section of the analysis include all predictor variables²²: development, radios, years data, and the relative status of women²³. We assess the effects of each of the predictor variables net of all controls. Recall that, thus far, we have included two different measures of relative female status. Sample A includes the Relative Female Status Index and sample B includes the service sector sex ratio.

The Effects of Development and Radios per 1,000 on the FPA

Table 4.3 displays the standardized coefficients for the effects of the independent variables, net of controls, for each offense type. Recall that bivariate analysis demonstrated high correlations between radios and development, making interpretation of the regression coefficients problematic. For this reason, the coefficients for development when radios is excluded from the model, and the coefficients for radios when development is excluded from the model, are shown in brackets.

²² Recall that the Gini index is included as a control, but since its effects are not statistically significant the coefficients are not shown in the tables.

²³ Care was taken in the choice of predictor variables to avoid the inclusion of variables that were extremely highly correlated with each other. This could not be avoided in the case of radios per 1,000, because alternative measures of opportunity were even more highly correlated with development. However, in multivariate models multicollinearity may still emerge between predictors that are highly correlated at the bivariate level (even if not at the $r = .70$ level). To test for multicollinearity the variance inflation factors (VIFs) associated with each predictor variable are reported in Appendix B. The variance inflation factor represents the multiplicative increase in the variance due to one predictor being correlated with other predictors. The standard cut-off point for indicating multicollinearity is 4.0 (Fox, 1991). All of the VIFs are below four in these models.

Including all variables in the model, development is a significant predictor of FPA for robbery for sample A, and a significant predictor of FPA for total crime, robbery, and theft for sample B. However, when radios is excluded from the model, the effect of development tends to be larger²⁴. In sample A, when radios is excluded the coefficient for the effect of development on the FPA for theft becomes significant.

Turning to the effect of radios, the standardized coefficients for radios also tend to be larger when development is excluded from the models²⁵. Predicting the FPA for theft in sample A, the standardized coefficient for radios is $B=.14$ with development in the model, and $B=.40$ with development excluded. Using sample B, the standardized coefficient is $B=.13$ with development in the model and $B=.38$ with development excluded. In both samples, when considering theft, the standardized coefficient for radios is significant only when development is excluded from the model. The coefficient for radios, with or without development in the model, does not have a statistically significant relationship to FPA for any other offense types.

An examination of these two models demonstrates that the relationships between each of these predictors and FPA are confounded by the presence of the other. Unfortunately, alternative indicators of opportunity for consumer crime that are less highly correlated with development are not readily available. In chapter 5 we discuss the types of indicators that would be better suited to address the question of the impact of opportunities for consumer crime on the female share of offending.

²⁴ Using both samples A and B, the coefficient for development in predicting robbery is actually smaller when radios is excluded, but it is not reduced substantially and remains statistically significant.

²⁵ Again, these patterns do not hold up for robbery, but when predicting robbery the coefficients for radios are not statistically significant either with or without development in the model.

The Effect of the Formalization of the Mechanisms of Social Control on the FPA

The formalization of the mechanisms of social control is measured by the number of years of sex-specific arrest data reported by a country to the Interpol. This variable is referred to as years data. Table 4.3 displays the coefficients for the effect of years data, controlling for other factors. Considering both samples, controlling for other factors, countries that report more years of data have a statistically significantly higher female percentage of arrests for total crime and robbery. The effect of years data on FPA for homicide is significant only using Sample A. Years data is not a significant predictor of the FPA for theft or fraud.

The Effect of Relative Female Status on the FPA

We now turn to the effect of relative female status, net of controls. Two different indicators of relative female status are assessed at this point—the Relative Female Status Index and the service sector sex ratio. The Relative Female Status Index coefficient is only statistically significant in predicting FPA for fraud, $B=.33$. A country's score on the Relative Female Status Index is not a statistically significant predictor of the female share of arrests for any of the other offense types (total crime, homicide, robbery, or theft).

Another measure of relative female status, the service sector sex ratio, is also assessed. The service sector sex ratio is statistically significantly related to the female share of arrests for two offenses: fraud and homicide. Countries with a higher sex ratio in the service sector have a higher female share of arrests for fraud, $B = .44$, and also have a higher FPA for homicide, $B=.34$.

Analysis of Alternative Indicators, Net of Controls

We have demonstrated that, controlling for other factors, years data have a statistically significant impact on FPA for total crime, homicide (in Sampel A), and robbery. Although confounded by its correlation with development, a higher number of radios per 1,000 is related to a higher FPA for theft. The coefficients for the Relative Female Status Index and the service sector ratio are both significant and positive for FPA for fraud, while the coefficient for the service sector ratio is also significant for homicide. In order to more fully exhaust the data and assess relationships between variables, we next consider analysis of alternative indicators of several concepts of interest.

Alternative Measure of Development

To this point the Human Development Index has been used to measure a country's level of development. The Human Development Index captures several aspects of human development, including longevity, knowledge/education, and standard of living. However, the gross domestic product per capita is another measure of development that is very commonly used. The GDP per capita is substituted for the Human Development Index using Sample A. Findings using the GDP per capita are more or less parallel to those found when the Human Development Index was used.

Appendix C presents the models that display different findings from the analysis using the Human Development Index. Differences between the two models include the fact that, unlike the Human Development Index, GDP per capita is significantly related to the FPA for total crime. Additionally, the Relative Female Status Index is a significant predictor of FPA for total crime when using GDP per capita. Overall, however, the effects of GDP per capita were very similar to those for the Human Development Index,

with both measures of development related to a higher female share of arrests.

Alternative Measures of Formalization of the Mechanisms of Social Control

Another concept that is difficult to measure is the formalization of the mechanisms of social control. The measure that has been used up until this point, the number of years a country reports sex-specific arrest rates, has been used to assess the formalization and professionalization of criminal justice systems (Steffensmeier et al., 1989). It is a somewhat indirect measure—it does not tap aspects of the actual functioning or personnel in a country’s criminal justice system. Alternative measures of the formalization of the mechanisms of social control are explored²⁶.

In their 1998 article Maguire et al. create an index of criminal justice system performance that is composed of three concepts: efficiency (number citizens per police employee²⁷), equity (13 measures of equality from the World Human Rights Guide, see Appendix D for specific indicators), and effectiveness (homicide rate per 100,000 from United Nations survey). Because criminal justice systems are created and maintained to prevent crime, the authors include the homicide rate as an indicator of effectiveness. However, since the female percentage of arrest is the dependent variable in this analysis, including the crime rate in the index of a predictor variable is redundant. We recalculate

²⁶ Two alternative indicators of formalization of the mechanisms of social control were also considered, but were eventually dropped. The Interpol reported clearance rate was not used because of problems with countries not reporting this figure. We calculated an “alternative clearance rate” by dividing the number of arrests by the number of offenses known. However, this resulted in values over 100% because of reporting and recording practices, and this figure was not considered as an alternative measure.

²⁷ The authors argue that countries that maintain a larger number of citizens per police employee are more efficient. Countries with a larger number of citizens per police employee are ranked as having higher performing criminal justice systems. Given that the index includes a measure of the homicide rate to assess the effectiveness of criminal justice systems such an interpretation is feasible. However, an alternative interpretation of the number of citizens per police employee is that countries with a larger number of citizens per police employee are less able to be effective and accurate in identifying and arresting criminal suspects. This interpretation is explored further below when the number of citizens per police employee is examined independent of the larger criminal justice system index.

the Maguire et al. index excluding the measure of homicide rate.

Data on the items included in the index are available for 43 countries in the data set. Countries with a lower rank on the re-calculated index have criminal justice systems that are characterized by more efficiency and more equity. Because this measure is available for so few countries, the remaining sample size for countries with non-missing values on other predictors and the dependent variables is very small—around 18 countries. Despite the small sample size regression models are run. The standardized coefficients for the re-calculated criminal justice system performance index are very small, and none reach statistical significance for any of the offense types.

The inclusion of the equity index in the criminal justice system performance index is an attempt to evaluate the fairness of criminal justice systems. In discussing some challenges with the overall measure Maguire et al. (1998) report that, “although it (the equity index) had a high alpha reliability coefficient, there is little evidence to support its validity” (p. 52). While there are also challenges in assessing the number of police employees in a nation, the number of citizens per police employee seems a more direct measure of the formalization of criminal justice systems. For this reason we explore this variable individually (as opposed to in the context of the criminal justice index) as a measure of the formalization of the mechanisms of social control. Countries with fewer citizens per police employee are assumed to have an improved ability to identify and arrest individuals responsible for offending, and be more accurate in recording details of the incident (including type of offense and characteristics of the offender). Data on the number of citizens per police officer are available for 53 countries. Again, because this measure is available for so few countries, the remaining sample size for countries with

non-missing values on other predictors and the dependent variables are very small, around 18 countries. Despite the small sample size regressions are run, Appendix E displays the results that differ from those that stem from using years data. Citizens per police officer is only significant in predicting FPA for total crime. The coefficient is positive, however, indicating that countries with more citizens per police officer report a higher FPA for total crime.

One explanation for the positive relationship between citizens per police officer and FPA for total crime is that Maguire et al.'s (1998) initial interpretation that a higher the number of citizens per police officer reflects a more efficient criminal justice system, was accurate. The total crime category includes arrests for all offenses and is likely heavily weighted by less serious types of offending. The female rate of offending is highest in the total crime category. Countries with more efficient criminal justice agencies might be capturing a larger number of female relative to male offenders for these types of offenses, leading to a higher female percentage of arrests.

Alternative Measures of Relative Female Status

The conceptual and methodological challenges of measuring relative female status are discussed in chapters 2 and 3. Table 4.4 lists all of the measures of relative female status considered in this analysis²⁸. The table includes the name of the measure, how it is operationalized, and the number of countries for which there are data²⁹. While not exhaustive of all of the measures available to operationalize relative female status, these measures do tap numerous different areas of social life in which the achievements

²⁸ Two other measures were considered but not included because they are too highly correlated with development. These two measures are the fertility rate and contraceptive use rate.

²⁹ Recall that the size of the study sample varies by offense type. The table presents the range of sample sizes across offense types.

and opportunities for women and men differ. Data for these measures of relative female status come from the United Nation's Women's Indicators and Statistics Database (United Nations, 1999) and the United Nation's *Human Development Report* (2004).

Two measures of relative female status have been considered up until this point: the Relative Female Status Index and the service sector sex ratio. The Relative Female Status Index is composed of the female to male ratio: enrolled in primary school and secondary school, employed as secondary school teachers, and economically active in the industry and service sectors. The service sector sex ratio is included as a separate measure because there is less missing data on this variable than any of the other indicators of the relative status of women, and it allowed a larger sample size. In addition to these measures, two other components of the Relative Female Status Index are considered independently: industry sector sex ratio and sex ratio of secondary school teachers. The two remaining components of the index, the sex ratio for enrollment in primary and secondary school, are too highly correlated with development to be included in regression equations independent of the index.

Another alternative measure of relative female status that is considered is the Gender Empowerment Measure³⁰. This is a composite index composed of the female to male ratio of: estimated earned income; positions as legislators, senior officials, managers, professionals, and technicians; and representation in parliament. Correlations between the Gender Empowerment Measure and the Human Development Index exceed the $r = .70$ level for only some offenses. It will thus still be examined as an alternative measure of relative female status, keeping in mind the issue of the potential impact of

³⁰ The GEM is a composite index composed of the female to male ratio of: estimated earned income; positions as legislators, senior officials, managers, professionals, and technicians; and representation in parliament.

multicollinearity. One of the individual items included in the GEM will also be considered independently, the sex ratio of representation in parliament.

Four other alternative individual measures of relative female status will be considered. Two of these measures deal with gender disparities in education. These measures are the ratio of females to males enrolled in post-secondary schools (university, teachers' college, or higher professional school), and the female to male illiteracy ratio. The third measure relates to the economic sector and measures the ratio of women per 100 men who are economically active. The fourth measure relates to family formation, the male – female difference in mean age at first marriage among those who ever married in 15 - 49 age group.

Effects of Relative Female Status on the Female Percentage of Arrests

Table 4.5 displays the standardized coefficients for the effects of all of the measures of the relative status of women (including those considered previously), while controlling for development, radios and years data³¹. Of the 10 indicators of relative female status included in models predicting five different offense categories, five coefficients are statistically significant (out of a total of 50). Four of these coefficients are for the effect of predictors on the FPA for fraud: the Relative Female Status Index, the service sector sex ratio, the Gender Empowerment Measure, and the economically active sex ratio. The fifth statistically significant coefficient is for the effect of the service sector sex ratio on the FPA for homicide.

There are a large number of coefficients testing the effects of relative female

³¹ The Gini index is also included as a control for income inequality but the coefficient is not shown. The effects of development, radios and years data using the alternative measures of relative female status are not substantially different from the models already presented and thus for clarity of presentation the coefficients for those variables are not shown.

status on the female percentage of arrests, meaning that a certain number would be expected to be statistically significant by chance alone. However, this matter is complicated because there is some overlap between indexes and their individual components. Additionally, there is a pattern with four of the five statistically significant coefficients being related to the female share of offending for fraud. Taken together, these effects warrant further consideration.

Recall that the service sector sex ratio is a component of the Relative Female Status Index, the bivariate correlation between these two measures is high, $r = .77$. Controlling for other factors, both predictors are significantly positively related to the FPA for fraud. The standardized coefficient for the Relative Female Status Index is $B=.33$ and for the service sector sex ratio is $B=.44$. This indicates that countries with a higher female to male ratio of service sector involvement, and countries with a higher score on the Relative Female Status Index, have a higher female percentage of arrests for fraud. Given that the service sector sex ratio is one of the components of the Relative Female Status Index, the service sector sex ratio is likely driving the effect of the index.

On first inspection, these findings would seem to indicate that higher female status is associated with a higher female share of arrests. However, interpretation of the sex ratio in the service sector is complicated. One perspective is that a higher ratio of female to male employment, regardless of what type of employment, is positive, in that it indicates that women have increased access to paid employment. However, service sector employment typically involves low-status and low-wage work. A higher female to male ratio in this sector could be taken to reflect economic marginalization as opposed to gender equality. The interpretation of the positive coefficient for the relationship

between service sector sex ratio and the FPA for fraud is not clear.

Two other variables have statistically significant relationships with fraud. First we consider the Gender Empowerment Measure. Countries with a higher score on the Gender Empowerment Measure have a higher FPA for fraud ($B=.46$). A high score on the GEM indicates smaller gender differences in income, positions in professional and technical work, and representation in parliament. A high score on the GEM would seem to suggest a higher relative status of women, indicating that a higher relative status of women is related to a higher female share of offending for fraud.

However, a higher ratio of females to males who are economically active is also statistically significantly related to a higher FPA for fraud ($B=.39$). Again, we come up against the difficulty in interpreting the impact of the economically active ratio. In discussing the significant impact of female labor force participation on the female percentage of arrests for minor theft, Steffensmeier et al. (1989) suggest that female labor force participation “is not indicative only of female equality; it may also be an indicator of female deprivation in the sense that many women work mainly out of financial necessity” (p. 272).

Fraud is defined by the Interpol as “any act of gaining unlawful possession of another person’s property other than by theft” (Interpol, 1997, introduction). Female arrests for fraud are generally not of a white-collar or occupational nature, but are overwhelmingly for crimes like bad checks, forged credit cards, theft of services, forged identification, and small con games (Steffensmeier & Allan, 1996). It is important to note that the effects of relative female status are most consistent for these relatively minor forms of property offending.

The significance of the effect of service sector sex ratio on FPA for homicide is difficult to interpret. The female rate of arrest for homicide is very low and does not display a great deal of variation cross-nationally. Additionally, of the ten coefficients assessing the relationship between relative female status and FPA for homicide, only one is significant. The statistical significance of service sector sex ratio in predicting homicide should not be given a great deal of weight.

Examining the signs of the coefficients for the effects of measures of relative female status on the female percentage of arrests can provide an idea of the general direction of the effects of relative female status. Again, there are mixed results in interpreting the whether relative female status is related to a higher or lower female share of offending. Higher values on four measures seem to be relatively clear indicators of a higher status of women: industry sector sex ratio, Gender Empowerment Measure, parliament ratio, and post-secondary enrollment ratio; while higher values on two measures seem to be relatively clear indicators of female marginality: illiteracy ratio and sex difference in age at first marriage. Slightly over half of the signs for these coefficients indicate that high female status is related to a higher female share of offending, and slightly under half indicate that female marginalization is related to a higher female share of offending. The overall pattern of the signs of the coefficients also does not signify a strong pattern in the direction of the relationship between relative female status and the female percentage of arrests.

When considering all measures of the relative status of women, this concept does not have a strong impact (either positive or negative) on the female share of offending for most offense types. The overall direction of the effect of relative female status on the

female share of arrests is also not clear. Relative female status *is*, however, consistently related to the female share of arrests for one offense: fraud. A more thorough examination of the relationship between relative female status and the FPA for fraud will be presented in the following chapter.

The relationship between relative female status and the female share of offending also needs to be considered in light of the other predictor variables. Development and years data have much more consistent relationships with the female percentage of arrests than relative female status does. All of the coefficients for development are positive, indicating that more highly developed countries have a higher female share of arrest. The effects of development are confounded with the effects of radios, but the coefficients for development are statistically significant in four cases. All but one of the coefficients for years data are positive, and five of the coefficients are statistically significant. Radios seems to have a less consistent relationship with the female share of offending, but these effects are confounded by correlation with the development indicator.

Summary

More highly developed countries have a higher female share of arrests for all offense types. Three factors were proposed to explain the relationship between female percentage of arrests and development. These explanatory factors were opportunity for consumer crime, formalization of the mechanisms of social control, and relative female status. Multicollinearity among explanatory factors and small sample size due to missing values both on the dependent and predictor variables made fleshing out these relationships challenging.

The first portion of this chapter examined the extent to which the effect of development was mediated by radios, years data and relative female status. Years data was a significant predictor of FPA for total crime, homicide, and theft in sample A, and robbery in both samples A and B. The service sector sex ratio was a significant predictor of FPA for fraud. The only statistically significant mediator was years data in the model predicting FPA for robbery.

The next section of the analysis focused on the impact of each independent variable, controlling for the effects of the others. The multicollinearity between radios and development made fleshing out their independent effects difficult. Excluding radios, the coefficients for development were positive and statistically significant for total crime (only in sample B), robbery and theft. The effects of radios became more apparent when development was excluded from the models. Countries with a higher number of radios per 1,000 had a higher FPA for theft. Countries reporting more years of data had a higher FPA for total crime, homicide (only in sample A) and robbery.

The effects of relative female status on the female percentage of effects were weaker than those of development and years data. Statistically significant findings for the effect of relative female status were somewhat rare. However, four out of the five statistically significant coefficients were predicting the FPA for fraud, a category consisting of relatively minor types of property offending. In the following chapter we will describe in more detail the caveats associated with measuring relative female status, as well as how they reflect on these findings.

The following chapter will address the issues surrounding the measurement of relative female status, as well as the other predictor variables. While exploiting the

available data to the fullest degree, the preceding multivariate analysis also revealed numerous challenges associated with cross-national research. Theoretical and methodological approaches to dealing with these issues are addressed in the following chapter.

Table 4.1

OLS Regression of the Female Percentage of Arrests on Development, without Mediating Variables[†] (standardized coefficients in parentheses)

Sample A					
	Intercept	β	R ²	Adj R ²	N
Total	-5.55	18.17** (.53)	.26	.21	36
Homicide	.54	11.60** (.45)	.20	.15	34
Robbery	-7.52	14.91** (.69)	.37	.32	28
Theft	-25.11	50.10** (.64)	.42	.37	28
Fraud	-8.92	30.74** (.55)	.30	.25	36
Sample B					
	Intercept	β	R ²	Adj R ²	N
Total	-3.28	17.56** (.50)	.24	.21	48
Homicide	3.22	9.42** (.37)	.15	.12	47
Robbery	-3.72	12.15** (.60)	.37	.33	39
Theft	-26.44	48.39** (.64)	.40	.37	40
Fraud	.89	22.58** (.34)	.12	.09	50

[†]Includes control for Gini index.

* p ≤ .10 ** p ≤ .05

Table 4.2

OLS Regression of the Female Percentage of Arrests on Development and Mediators Entered Individually[†] (standardized coefficients shown)

Sample A						
	Development	Radios	Development	Years Data	Development	Relative Female Status Index
Total	.42*	.09	.34*	.42**	.52**	-.08
Homicide	.30	.19	.21	.40**	.39*	.03
Robbery	.76**	-.12	.48**	.37*	.78**	-.20
Theft	.45*	.30	.51**	.33*	.69**	-.10
Fraud	.44*	.20	.51**	.12	.44**	.21
Sample B						
	Development	Radios	Development	Years Data	Development	Service Sector Sex Ratio
Total	.48**	.04	.42**	.19	.45**	.11
Homicide	.22	.23	.30*	.18	.22	.26
Robbery	.65**	-.09	.47**	.27*	.67**	-.16
Theft	.53**	.18	.56**	.20	.64**	.01
Fraud	.22	.19	.39**	-.16	.13	.47**

[†]Includes control for Gini index.

* p ≤ .10 ** p ≤ .05

Table 4.3

OLS Regression of the Female Percentage of Arrests on Independent Variables, Net of Controls[†]
(standardized coefficients shown)

Sample A									
	Development		Radios		Years Data	Relative Female Status Index	R ²	Adj R ²	N
Total	.24	[.24] ^a	-.00	[.11] ^b	.47**	.29	.41	.32	36
Homicide	.06	[.09] ^a	.06	[.08] ^b	.42**	.28	.33	.21	34
Robbery	.68**	[.52**] ^a	-.33	[-.07] ^b	.41**	-.09	.51	.40	28
Theft	.42	[.51**] ^a	.14	[.40*] ^b	.30	.03	.51	.40	28
Fraud	.19	[.31] ^a	.20	[.29] ^b	.19	.33*	.39	.29	36
Sample B									
	Development		Radios		Years Data	Service Sector Sex Ratio	R ²	Adj R ²	N
Total	.35*	[.32*] ^a	-.04	[.13] ^b	.27*	.21	.30	.22	48
Homicide	.01	[.07] ^a	.13	[.18] ^b	.25	.34*	.27	.18	47
Robbery	.57**	[.52**] ^a	-.12	[.09] ^b	.27*	-.06	.44	.35	39
Theft	.46*	[.53**] ^a	.13	[.38*] ^b	.19	.04	.44	.36	40
Fraud	.06	[.15] ^a	.18	[.18] ^b	-.08	.44**	.32	.24	50

[†] Models include the Gini index as a control, coefficient not shown.

* p ≤ .10 ** p ≤ .05

^a Coefficient for development when radios is excluded from the model.

^b Coefficient for radios when development is excluded from the model.

Table 4.4
Measures of Relative Female Status

Measure	Operationalization	Number of Countries Across Offense Type
Relative Female Status Index	Composite index, female to male ratio: enrolled in primary school and secondary school, employed as secondary school teachers, and economically active in the industry and service sectors	28-36
Secondary Teacher Sex Ratio*	Number of female teachers per 100 male teachers at second level, controlling for sex ratio in population	23 – 31
Industry Sector Sex Ratio*	Number of women per 100 men counted as economically active in the Industry sector, age 15 and over, controlling for sex ratio	39 – 49
Service Sector Sex Ratio*	Number of women per 100 men counted as economically active in the Service sector, age 15 and over, controlling for sex ratio	39 - 50
Gender Empowerment Measure	Composite index, female to male ratio of: estimated earned income; positions as legislators, senior officials, managers, professionals, and technicians; and representation in parliament.	29 - 40
Parliament Sex Ratio**	Number of seats held by women per 100 seats held by men in the upper and lower houses of government, controlling for sex ratio	32 – 40
Post-Secondary Sex Ratio	Female to male enrollment ratio at university, teachers' college, or higher professional school, controlling for the sex ratio in the population	31 – 38
Illiteracy Ratio	Number of illiterate women per 100 illiterate men age 15-24, controlling for sex ratio in the population	26 – 31
Economically Active Sex Ratio	Number of women per 100 men counted as economically active, age 15 and over, controlling for sex ratio of population	39 – 48
Age Difference at First Marriage	Male – female difference in mean age at first marriage among those who ever married age 15-49	32 - 40

*Component of Relative Female Status Index that is also tested individually.

**Component of the Gender Empowerment Measure that is also tested individually.

Table 4.5

OLS Regression of Female Percentage of Arrests on Measures of Relative Female Status, Net of Controls[†] (standardized coefficients shown)

Variable	Total	Adj R ²	N	Homicide	Adj R ²	N	Robbery	Adj R ²	N	Theft	Adj R ²	N	Fraud	Adj R ²	N
Relative Female Status Index	.29	.21	36	.28	.22	34	-.09	.41	28	.03	.40	28	.33*	.29	36
Service Sector Sex Ratio	.21	.22	48	.34*	.18	47	-.06	.35	39	.04	.36	40	.44**	.24	50
Industry Sector Sex Ratio	.15	.21	48	.10	.11	47	.08	.36	39	.00	.36	40	-.01	.09	50
Secondary Teacher Sex Ratio	.10	.32	31	.08	.27	31	.06	.26	25	.21	.66	23	.27	.21	31
Gender Empowerment Measure	-.32	.18	32	-.06	.001	29	.39	.48	28	.24	.28	29	.46*	.19	34
Parliament Sex Ratio	-.11	.19	38	-.24	.06	37	-.04	.34	34	.25	.48	32	-.02	.02	40
Economically Active Sex Ratio	.08	.19	48	.09	.11	47	.22	.39	39	.11	.37	40	.39*	.22	50
Post-Secondary Sex Ratio	-.19	.16	38	.10	.15	38	-.21	.35	31	.17	.34	32	.21	.09	40
Illiteracy Ratio	.09	-.06	28	-.01	-.04	30	.23	.15	26	-.16	.15	26	.13	.01	31
Sex Diff. Age 1 st Marriage	-.11	.19	37	-.36	.07	36	-.05	.38	32	.20	.36	34	-.21	.06	40

[†]Includes controls for development, radios, years data and Gini index, coefficients not shown.

* $p \leq .10$ ** $p \leq .05$

Chapter 5

Discussion and Conclusion

The primary objective of this research was to investigate the relationship between national development and the female share of offending. Further, this research explored the effectiveness of relative female status, opportunity for consumer crime, and formalization of the mechanisms of social control, at explaining the relationship between development and the female share of offending. First, the direct impact of development on the female percentage of arrests was examined. Next, the suggested mediating variables were included with development, and their impact on the female percentage of arrests was investigated. Finally, the effect of each independent variable, net of controls was assessed.

Review of Methods and Data

Countries were the unit of analysis with the final study sample consisting of approximately 40 countries, depending on the offense and predictor variables being considered. Country-level data to address these questions were taken from multiple sources. Data on male and female arrest rates from 1997 through 1999 came from the Interpol's *International Crime Statistics* (International Criminal Police Organization, 1997, 1998, 1999). The female percentage of arrests was the primary dependent variable. The FPA measures the percentage of all arrestees that are female while controlling for the sex distribution of the population. These figures were averaged across the 1997 to 1999 time frame. Population figures were drawn from the U.S. Census International Database (U.S. Census Bureau, 2005).

The primary measure of development was the United Nation's Human Development Index. The HDI is a composite index composed of life expectancy at birth, adult literacy rate, gross enrollment for primary, secondary and tertiary schools, and the gross domestic product per capita. Values for the HDI were drawn from the 2004 *Human Development Report* (Fukada-Parr). The primary measure of the formalization of the mechanisms of social control was the number of years a country reported sex-specific arrest data to the Interpol between 1985 and 1999. The measure of opportunities for consumer crime was the number of radios per 1,000 and was drawn from the United Nations WISTAT database. The Gini index was included to control for income inequality. Data for the Gini index were drawn from 2004 *Human Development Report* (Fukada-Parr, 2004), the Deininger and Squire database (Deininger & Squire, n.d.) and the World Bank's online database (The World Bank Group, n.d.).

Several indicators of relative female status were examined. Two indicators were composite indexes: the Relative Female Status Index³² and the Gender Empowerment Measure³³. The remaining indicators of relative female status were single-measure indicators. The following single-measure indicators were components of the Relative Female Status Index, but their effects were also investigated independent of the index, female to male ratio that are: economically active in the industrial sector, economically active in the service sector; and teachers at the secondary level. One measure that was a component of the Gender Empowerment Measure was also investigated independent of the index, number of women per 100 men holding seats in parliament. Four other

³² Recall that the Relative Female Status Index is composed of the female to male ratio of: enrollment in primary school and secondary school; employment as secondary teachers; and economic activity in the industry and service sectors.

³³ Recall that the GEM is composed of the female to male ratio of: estimated earned income; positions as legislators, senior officials, managers, professionals, and technicians; and representation in parliament.

measures of relative female status were also investigated: the male – female difference in mean age at first marriage, female to male ratio of post-secondary enrollment; female to male illiteracy ratio; and the ratio of females to males who are economically active. Data for the GEM were drawn from the United Nations *Human Development Report* (Haq 1995) and data for the rest of the measures of relative female status were drawn from the United Nations Women’s Statistics and Indicators (WISTAT) database (United Nations, 1999).

The primary analytic technique used in this analysis was Ordinary Least Squares regression. The effects of development and the mediating variables were assessed through the use of reduced models (including only development and the Gini coefficient as predictors) and full models (including all mediating variables that were significantly predicted by development). The Clogg test of mediation was applied to assess the significance of the decrease in the size of the development coefficient from the reduced to the full model and to determine mediation effects. To clarify further the relationship between the predictors and the female percentage of arrests, OLS models were run that included all of the predictor variables. This provided an assessment of the relationship between each of the predictors and the FPA, controlling for the effects of the other variables.

Review of Key Findings

This section will review the major findings of this research. Each of the major predictor variables will be considered in turn. We begin with a consideration of the effects of development, followed by opportunity for consumer crime, formalization of the

mechanisms of social control, and relative female status. The effect of each of these factors on the female share of arrests will be considered in relation to the expectations described in chapter one, and also in relation to previous work in the field.

Review of the Effects of Development

More developed countries tended to have a higher female percentage of arrests than less developed countries, although there were some difference by type of offense. More highly developed countries had a higher FPA for total crime (all offenses detected by the police), theft, and fraud. The female percentage of arrests for robbery and homicide varied little across development level. The FPA for homicide ranged between 8.4 and 10.8, while the FPA for robbery had a range of 5.0 to 6.9. This finding is in line with our expectation of differences in the effect of development by crime type. Additionally, the mean FPA for homicide and robbery were lower than that for the other offense categories. Together, these figures suggest that the female share of arrests for homicide and robbery are low across countries at different levels of development.

Both homicide and robbery are violent or have a violent/confrontational component. The lower female share of arrests for these offenses is in line with previous research in the area of gender and crime that finds that compared to males, females account for a small proportion of all violent offenses (Bortich and Hagan, 1990; Simon and Landis, 1991; Smith and Visser, 1980; Steffensmeier, 1993; Steffensmeier and Allan, 2000). Most of the research in this field has been focused on the U.S. and Canada, although there have been some cross-national investigations (for instance, Simon and Landis, 1991 and Steffensmeier et al. 1989). By including multiple countries at different levels of development, this research provides important additional support demonstrating

that female participation in violent offending is low, and that this relationship is consistent cross-nationally.

This research sought to explore the effects of three factors in explaining the effect of development on female share of offending: opportunity for consumer crime, formalization of the mechanism of social control, and relative female status. After controlling for these three factors development continued to be a statistically significant predictor of the FPA for robbery, and less consistently for total crime and theft (see Tables 5.1 and 5.2 for a review). This indicates that while the formalization of the mechanisms of social control, opportunity for consumer crime, and relative female status do explain some of the relationship between development and the female share of offending, some of the effect of development remains even after these factors are considered. Also, although there is relatively little variation in the female share of arrests for robbery, what little variation there is, is associated with development.

Review of the Effects of Opportunity for Consumer Crime-

Development has been associated with broad changes in consumerism, consumption, self-service marketing, and the growth of credit-based economies. These changes are associated with an increase in opportunities for the types of property offending that comprise a larger proportion of female than male crime. Based on this, opportunity for consumer crime was one of the explanatory variables included in this analysis. The measure of opportunity for consumer crime used in this study was the number of radios per 1,000. This measure was chosen to reflect the availability of products that are prone to theft and have a mass marketing dimension that encourages a variety of consumer crimes.

Radios per 1,000 was highly correlated with development, which made interpreting the effects of each difficult. However, when development was excluded from models, radios per 1,000 had a significant effect on the female share of theft offending (see tables 5.1 and 5.2 for a review of these relationships). Countries with a higher number of radios per 1,000 reported a higher female share of theft offending. Radios per 1,000 was not statistically significantly related to the FPA for any other offense.

Previous research has suggested that changes in opportunities for consumer crime would differentially impact male and female rates of offending, and the gender gap in crime, especially for property crime. The findings from this research are somewhat in line with expectations and with previous research, as countries with a higher number of radios per 1,000 had a higher female share of arrests for theft. Since both robbery and fraud involved a theft component, we would expect opportunity for consumer crime to be related to these offenses as well. Steffensmeier et al (1989) found that, when development was excluded from the model, radios per 1,000 had a statistically significant relationship with both minor theft (equivalent to theft and fraud in this research) and major theft (equivalent to robbery in this research). However, the high correlation between radios per 1,000 and development made interpretation of these effects difficult. To more accurately assess this question alternative measures of opportunity for consumer crime must be explored. The types of measures that would allow a more thorough examination of this question are addressed below in the section on alternative measures and methods.

Review of the Effects of Formalization of the Mechanisms of Social Control

Based on previous research (Clinard and Abbot, 1973; Steffensmeier et al. 1989) we proposed several ways in which more formalized criminal justice systems can impact the female, relative to male, rates of arrest. Formalization can lead to more institutionalized mechanisms for crime reporting and better record keeping. This would lead to a more accurate and regular reporting of the sex of the offender. Developed countries are also more likely to have facilities to house female prisoners, reducing the reluctance to arrest females. More formalized criminal justice systems are also associated with more police professionalism, and more universal application of the law (Vigderhous, 1978). The tendency to treat female offenders more leniently, by avoiding formal sanctions, would presumably be diminished. Finally, more formalized criminal justice systems would be more likely to handle less serious crimes more formally. Because a larger proportion of all female offending is accounted for by less serious types of crime, this change could impact female rates of arrest more strongly than male rates of arrest. These factors could lead to an *appearance* in the growth of female, relative to male offending. These differences, however, may simply reflect the varying degree to which the police officially sanction female offenders.

The primary measure of formalization of the mechanisms of social control used in this research was the number of years a country reported sex-specific arrest data to the Interpol between 1985 and 1999³⁴. Formalization of the mechanisms of social control was most consistently associated with a higher female share of offending for total crime and robbery, although in one model it was also associated with the FPA for homicide (see

³⁴ Alternative indicators of formalization of the mechanisms of social control were explored, but most were available for a small sample of countries. The only statistically significant coefficient was for the effect of the number of citizens per police officer on the FPA for total crime.

Table 5.1 and 5.2 for a review). These findings are similar to Steffensmeier et al (1989) who found that formalization has strong positive effects on homicide and major property crime (equivalent to robbery in this study). While robbery is a relatively serious type of offending with a violent/confrontational component, the composition of the total crime category is less clear. The total crime category includes all offenses known to the police, and is not just the sum of the offenses reported to Interpol. There is little (if any) cross-national analysis of the composition of the total crime category, however in U.S. crime figures the total crime category is heavily weighted by relatively minor types of offending (Steffensmeier, 1993). More formalized criminal justice agencies are related to a greater visibility for female crime of both a serious/violent nature (robbery and less consistently homicide) and a more minor nature (total crime).

Review of the Effects of Relative Female Status

Given the challenges in measuring relative female status, this project included numerous strategies in an effort to accurately assess this concept. Several alternative measures of relative female status were included. These measures tapped differences in the status and achievements of men and women in multiple spheres including employment, education, politics, and family formation. The effects of both individual items and indexes were tested. Working within the constraints of available data and measures, and including controls for other factors, this project makes an important contribution to the literature examining the relationship between relative female status and the female share of offending.

Compared to other independent variables, the effects of relative female status on the female percentage of arrests was weak (see table 5.3 for a review of relationships

between relative female status and the female share of arrests). Relative female status is consistently related to the female share of offending for only one offense, fraud. Four of the five significant relative female status coefficients explained variation in the FPA for fraud.

We begin with an interpretation of the relationship between relative female status and the female share of arrests for fraud. A higher ratio of females to males who are economically active, and economically active in the service sector³⁵, are both associated with a higher female percentage of arrests for fraud. In one sense, a high sex ratio would seem to indicate a higher status of women, in that females have access to paid employment. However, economic activity overall, and particularly in the service sector, can also be interpreted to indicate female marginality. Economic activity for females may indicate marginalization because traditional sex roles stipulate that women should be primarily responsible for domestic and childcare duties. If this is the case, a higher sex ratio in the economically active population would indicate that women are working outside of the home not by choice, but out of financial necessity. Because service sector employment typically involves low-status and low-wage work a higher female to male ratio in this sector could be taken to reflect economic marginalization. Young et al. (1994) also suggest that a high female to male ratio of service-sector employment “reflects women’s need to generate income in ways compatible with their traditional work as wives and mothers” (Young et al., 1994, p.70).

In addition, measures of economic activity may have different meanings depending on a country’s level of development. For example, in more highly developed

³⁵ The service sector covers wholesale and retail trade, restaurants and hotels, transport, storage and communication, financing, insurance, real estate and business services, community, social and personal services (including public administration and defense).

countries employment in the service sector, relative to other types of employment, may supply relatively low wages. But in developing countries with very limited employment opportunities, service sector labor may provide a relatively high standard of living and thus be more desirable. Thus, measures of relative female status that focus on female to male ratios of employment can be context-specific.

The results indicating that the FPA for fraud is related to greater female economic activity overall, and in the service sector, are in line with previous studies that find a relationship between female labor force participation and minor forms of property offending (Clark, 1989; Steffensmeier et al., 1989). Both Clark et al. (1991) and Steffensmeier et al. (1989) found that countries with greater female relative to male rate of labor force participation had a higher female share of offending for minor theft and fraud. Clark et al (1991) seem to interpret female relative to male labor force participation as indicative of greater relative female status, while Steffensmeier et al (1989) acknowledge that it may also signify female marginalization.

Recall that two indexes are also significant predictors of the FPA for fraud: the Relative Female Status Index and the Gender Empowerment Measure. The relationship between the Relative Female Status Index and the FPA for fraud is likely driven by the relationship between service sector sex ratio and the FPA for fraud. Interpreting the relationship of the GEM to the FPA for fraud is somewhat more challenging. The GEM seems to be a somewhat less problematic indicator of relative female status in that a high score indicates smaller gender differences in income, positions in professional and technical work, and representation in parliament. This suggests then that greater relative status of women is associated with a higher FPA for fraud.

The association between the measures of relative female status (especially the work-related items) and the FPA for fraud could be explained by the expanded opportunities for fraud offenses opened up to women when they enter the world of work. Recall that female arrests for fraud are generally not for white collar or occupational crime, but instead are for offenses like overdrawing a checking account, forged identification, and theft of services. These types of offenses may be more appealing to females for several reasons. They do not require physical aggression like many forms of street crime. Additionally, these offenses can be committed individually and do not require collaboration with criminal groups, to which women have limited access (Steffensmeier and Terry, 1986). Employment in the labor force opens up avenues of access to credit in the form of credit cards and checking accounts that are generally not available those who are not employed. As the proportion of women who work increases, so does their opportunity to engage in fraud offenses like over-drawing checking accounts and credit card fraud (Steffensmeier and Streifel, 1992). While relative female status does affect the female share of offending for fraud, its impact on all other offenses (total crime, homicide, robbery, and theft) is very minimal.

This project makes an important contribution to the literature concerning the relationship between female status and female offending. It goes beyond previous literature in providing a more thorough assessment of the concept of female status. The measures used here include both composite indexes and individual items, and incorporate items that tap multiple different aspects of female status including: employment, education, politics, and family formation. Aside from its effect on the female share of arrests for fraud, relative female status does not strongly impact the female share of

offending for other offenses. These results are in line with other cross-national studies that have also found very weak or no effects of gender role convergence/female status on female crime (Hartnagel, 1982; Hartnagel & Mizanuddin, 1986; Steffensmeier et al., 1989).

These findings will be interpreted in light of both perspectives suggested at the start of this project: the liberation hypothesis and the female marginalization perspective. The weak relationship between relative female status and the female share of offending may indicate that the liberation hypothesis is flawed. Inconsistencies between relationships suggested by the liberation hypothesis and findings regarding female status and female crime have been suggested by much previous research (for example see Berger, 1989; Box and Hale, 1984; Chesney-Lind, 1986, Hartnagel & Mizanuddin, 1986; Steffensmeier et al., 1989). This research provides additional evidence that an equalization of gender roles may not lead to a change in the female share of arrests. The liberation hypothesis argues that gender equality and the associated increases in employment, education, and the social status of women will lead to increasing opportunities for female offending, and a change in the nature of female crime to include more lucrative forms of property crime and increased female participation in violent types of offending (Adler 1975). This hypothesis suggests that increases in female status will be associated with a higher female share of offending. These contentions run counter to traditional theories of crime that suggest that factors such as unemployment, poor education, blocked opportunities, and low aspirations lead to criminal offending. Higher female status, relative to males, may not lead to increased criminal offending. Instead it may decrease strain and anomie, and increase legitimate opportunities and

investment in legitimate society, therefore decreasing offending by females.

It is important to regard these findings with caution and an alternative interpretation of these findings is now considered. Steffensmeier et al (1989), suggest that that the gender equality- crime relationship may only becomes apparent when comparing countries with very different levels of gender equality. They suggest that “there may be a threshold range or level. Above this level (i.e., once one moves beyond stringently sex-segregated societies), very little effect on proportionate female involvement in crime will result from difference in the status of women” (p. 276). This suggestion is difficult to assess because countries with a low status of women are less likely to report arrest figures to Interpol.

The marginalization perspective suggests that development will lead to increased economic vulnerability for females. This vulnerability comes from segregation of women into low paying and low status jobs, increased rates of divorce and female-headed households, and a breakdown of the traditional safety net of family and kinship bonds. The marginalization perspective would suggest that countries with lower levels of relative female status (or greater marginalization of women) would have a higher female share of offending. The results of this research did not provide strong support this contention either. The relationship of the economically active sex ratio and service sector sex ratio to the female percentage of arrests for fraud can be interpreted to provide some support for this perspective. However, female status was not strongly related to the female share of offending for any other type of offending.

Alternative Measures and Methods

While this project makes an important contribution to the current research, it also

suggests several avenues for future research. Given the substantial challenges with data and measures, this section describes the types of data and measures future research could explore that may contribute to a more in-depth assessment of the questions at hand. We also suggest different methodological approaches for making the most of the data that is available.

Alternatives to the Interpol for cross-national measures of crime and deviance are limited, but some options are available. The United Nations Crime Survey is based on official police and judicial figures, and thus is limited by several of the same issues as the Interpol. The International Crime Victims Survey provides data on victim reporting of criminal events for 58 nations and could provide a fruitful source for cross-national research on gender-specific victimization rates. Finally, the World Health Organization publishes sex-specific statistics on suicide. Suicide can be considered a type of deviant behavior, and research could examine the relationship between development, and sex-specific rates of suicide.

Pulling apart the effects of development and opportunities for consumer crime requires different indicators than those that are currently available. In addition to its high correlation with development, radios per 1,000 may not be accurately assessing the concept. Changes in the production/merchandising and marketing of goods, growth in a credit-based economy, and consumerism, may not be adequately captured by the number of radios per 1,000. Recall that the effects of radios per 1,000 on the female share of arrests were not particularly strong, and coefficients were difficult to interpret because of the high correlation between development and radios per 1,000. The types of indicators that would more accurately assess this concept include the number of shopping outlets

per capita, credit card use, and checking account use.

The primary measure of the formalization of the mechanisms of social control in this project was the number of years a country reported sex-specific arrest data between 1985 and 1999. Several alternative measures of the formalization of the mechanisms of social control were also explored. Some alternatives included the Interpol reported clearance rate, the ratio of offenses known to arrests, and the ratio of number of years a country reports counterfeit arrests to number of years a country reports homicide arrests. The index created by Maguire et al. (1998) provided the most direct measure of the formalization of social control in that it included an assessment criminal justice systems and was not based solely on reported criminal statistics. Unfortunately, the measures used to create this index were only provided for a limited number of countries, severely restricting the sample size. A more thorough exploration of this issue is made difficult due to a lack of quality data.

While the current project includes measures assessing many different aspects of female status, existing measures do not capture some important aspects of social life in which male-female inequities persist. An issue of particular interest is the distribution of resources and power within the home. Most measures of income use the household as the unit of analysis. This does not consider whether resources are distributed equally among men and women, and boys and girls, within the home. When females do not receive an equal share of resources, this measure underestimates the occurrence of deprivation among females. Most labor force statistics omit work that is done in the informal sector, therefore overlooking an important source of income for many of the world's women (Ward & Pyle, 2000). Measures that more accurately assess the distribution of resources

among men and women would allow improved assessment of the relative status of females.

Another measure of power dynamics within the home is domestic violence. The amount of domestic violence in a country is a useful indicator of relative female status. This measure would be particularly valuable in exploring rates of female violence, as research in the United States finds that female violence is often in response to male instigated violence, such as domestic abuse and assault (Bailey & Peterson, 1995). Accurate measures of violence in the home are notoriously difficult to achieve for several reasons including fear among victims of reporting, lack of victim-resources, non-responsiveness of criminal justice systems, and the manipulation of figures for political reasons. Cross-national data on domestic violence do exist, but the quality is questionable, and they are not available for a large number of countries.

Although this research fully exploited the measures that are available to assess a country's level of relative female status, the challenges in measuring this concept persist. An important step would be collecting data on the status of women and men from a larger number of countries. A more direct assessment of attitudes toward women could be captured by aggregating to the nation-level individual-level surveys tapping attitudes toward women. The World Values Survey is an international, individual-level survey that includes a relatively large number of countries (from 40 to 80). The composition of the survey varies across years, but it includes items that could be used to assess attitudes towards women. Future research on the relationship between relative female status and female share of offending could benefit by exploring these alternatives.

Methodologically, there are also different options to exploit, more fully, the

existing data on crime and social indicators. One approach would be to partition countries based on the concept of interest (for example development), and assess the impact of macro-structural variables on the female share of offending. This would allow researchers to explore whether explanatory factors are similarly related to the female share of offending in countries that fall into different categories of these variables.

While the challenges of missing data are substantial, researchers focusing on one country may be better able to take advantage of local resources for data on crime and other relevant social factors. This analysis demonstrated that low development countries had the most missing crime data. Encouraging these countries to report their data to international organizations like the Interpol or the United Nations more regularly and reliably would, logistically, be very difficult. However, researchers based in these countries may be better able to take advantage of existing sources of data (such as police records) and to encourage the more systematic collection and dissemination of data. This type of country-level research on the factors associated with male and female offending, and the female percentage of arrests, in countries other than the highly developed nations of North America and Europe would be a valuable resource.

The cross-sectional approach taken in this dissertation project has provided an assessment of the relationship between development level and the female share of offending in the late 20th century. Future research could benefit greatly by exploring these relationships over time. Questions of interest that could be addressed include exploring whether the relationship between explanatory factors and female share of offending was the same in the late 1990's as in previous decades. A theoretically interesting issue is how changes in development and female status have impacted changes

in the female share of offending. Time-series analysis that follows countries over multiple time points could be used to address this question.

Conclusion

This dissertation project explored the importance of development in explaining cross-national variation in the female share of arrests. Development is a complex concept that is associated with changes in many different aspects of social life that may impact the gender gap in offending. This project makes an important contribution to cross-national research on the relationship between development and the female share of arrests, as well as research on the relationship between female status and proportionate female criminality. It provides an important replication and extension of previous research on the topic (particularly Steffensmeier and colleagues, 1989), assessing these relationships at the close of the 20th century. Additionally it takes advantage of different and improved measures of several important concepts of interest. Most significantly, by including numerous alternative indicators of relative female status, this research provides a more extensive assessment of the relationship between female status and the female share of offending than was previously possible.

Development is associated with the formalization and bureaucratization of systems of social control, which leads to increases in the share of arrests for total crime and robbery (and less consistently for homicide) accounted for by females. When excluding development, an increase in opportunities for property offending is associated with a higher female share of arrests for theft. Relative female status is predictive of the female share of arrests for fraud, but it has little or no impact on the female percentage of

arrests for the other crime categories – homicide, robbery, theft, and total crime. It is hoped that this dissertation will serve as a springboard for future research seeking to better account for cross-national variation in female crime and the gender gap.

Summary Table 5.1

OLS Regression of the Female Percentage of Arrests on Independent Variables (average N = 32)

	Development	Opportunity for Consumer Crime	Formalization of the Mechanisms of Social Control	Relative Female Status Index	Development (without Opportunity)	Opportunity (without Development)	Adj R ²
Total	--	--	s	--	--	--	.32
Homicide	--	--	s	--	--	--	.21
Robbery	s	--	s	--	s	--	.40
Theft	--	--	--	--	s	s	.40
Fraud	--	--	--	s	--	--	.29

s = statistically significant

-- = not statistically significant

Summary Table 5.2

OLS Regression of the Female Percentage of Arrests on Independent Variables (average N = 45)

	Development	Opportunity for Consumer Crime	Formalization of the Mechanisms of Social Control	Service Sector Sex Ratio	Development (without Opportunity)	Opportunity (without Development)	Adj R ²
Total	s	--	s	--	s	--	.22
Homicide	--	--	--	s	--	--	.18
Robbery	s	--	s	--	s	--	.35
Theft	s	--	--	--	s	s	.36
Fraud	--	--	--	s	--	--	.24

s = statistically significant

-- = not statistically significant

Summary Table 5.3

OLS Regression of Female Percentage of Arrests on Measures of Relative Females Status

Variable	Total	Homicide	Robbery	Theft	Fraud
Relative Female Status Index	--	--	--	--	s
Service Sector Sex Ratio*	--	s	---	--	s
Industry Sector Sex Ratio*	--	--	--	--	--
Secondary Teacher Sex Ratio*	--	--	--	--	--
Gender Empowerment Measure	--	--	--	--	s
Parliament Sex Ratio**	--	--	--	--	--
Economically Active Sex Ratio	--	--	--	--	s
Post-Secondary Sex Ratio	--	--	--	--	--
Illiteracy Ratio	--	--	--	--	--
Sex Diff. Age 1 st Marriage	--	--	--	--	--

†Includes controls for development, radios, years data and Gini index, coefficients not shown.

s = statistically significant

-- = not statistically significant

*Component of Relative Female Status Index that is also tested individually.

**Component of the Gender Empowerment Measure that is also tested individually.

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Appendix A

OLS Regression of Development on Mediating Variables (standardized coefficients shown)

Variable	β	R²	Adj R²	N
Radios	.67**	.49	.48	93
Years Data	.43**	.20	.18	77
Relative Female Status Index	.73**	.46	.44	78
Service Sector Sex Ratio	.66**	.41	.40	93

* $p \leq .10$ ** $p \leq .05$

Appendix B

Variance Inflation Factor Scores for Variables in Sample A

Variable	Total Crime	Homicide	Robbery	Theft	Fraud
Development	3.5	3.3	3.2	2.8	2.7
Radios	2.3	2.3	2.5	2.9	2.3
Years Data	1.5	1.6	1.8	1.5	1.4
Gini	1.3	1.5	1.8	1.3	1.3
Relative Female Status Index	2.2	2.1	1.5	1.4	1.6

Appendix C

OLS Regression of Female Percentage of Arrest for Total Crime on Independent Variables, GDP as measure of Development (standardized coefficients shown)

Variable	β
GDP per capita	.67**
Relative Female Status Index	.36**
Radios	-.32
Years Data	.31*
R ²	.53
Adjusted R ²	.45
N	36

† Models include Gini index, although the coefficient is not shown.

* $p \leq .10$ ** $p \leq .05$

Appendix D

Indicators of Human Rights included in Human Rights Index:

- Freedom from extrajudicial killings or “disappearances”.
 - Freedom from torture or coercion by the state.
 - Freedom from censorship of mail or telephone tapping.
 - Freedom from indefinite detention without charge.
 - Legal right from police searches of home without a warrant.
 - Legal right from arbitrary seizure of personal property.
 - Freedom for or rights to all courts to total independence.
 - Legal right to be considered innocent until proven guilty.
 - Legal right to free legal aid when necessary, and counsel of own choice.
 - Legal right from civilian trials in secret.
 - Legal right to be brought promptly before a judge or court.
 - Freedom from capital punishment by the state.
 - Freedom from court sentences of corporal punishment.
-

From Index of Criminal Justice System Performance (Maguire et al. 1998)

Appendix E

OLS Regression of Female Percentage of Arrests for Total Crime on Independent Variables[†], Citizens per Police Officer as measure of Formalization (standardized coefficients shown)

Variable	β
Development	1.2**
Radios	-.01
Citizens per Police Officer	.66**
Relative Female Status Index	-.20
R ²	.51
Adjusted R ²	.20
N	21

[†] Models include Gini index, although the coefficient is not shown.

* p ≤ .10 ** p ≤ .05

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Agha, Suzanne E. and Darrell Steffensmeier. "Trends in Adolescent Female Violence." Paper presented at the annual meeting of the American Society of Criminology, Chicago, IL, 2002.

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